TRACE Laboratories

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Registered Firm

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Certificate No. A1330

IECQ

TEST RESULTS FOR:

INDIUM CORPORATION
1676 Lincoln Avenue
Utica, NY 13503

Attn: Dave Sbiroli

DATE IN:

October 18, 2000

P/O #:

Credit Card

SUBMISSION IDENTIFICATION:

One (1) solder paste sample identified as INDALLOY 241 with NC-SMQ230 flux vehicle for testing per ANSI/J-STD-004(1995), IPC-TM-650, method 2.6.3.3A for Surface Insulation Resistance.

SUMMARY OF RESULTS:

The solder paste flux met the requirements of ANSI/J-STD-004(1995), IPC-TM-650, method 2.6.3.3A for Surface Insulation Resistance.

We offer our test results.

APPROVED BY:

Renee J. Michalkiewicz
Laboratory Director

SURFACE INSULATION RESISTANCE

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REFERENCE:

ANSI/J-STD-004 (1995), paragraphs 3.2.4.5 and 3.2.4.5.1; and IPC-TM-650, method 2.6.3.3 A

REQUIREMENT:

The insulation resistance of each comb pattern shall be 1×10^8 ohms minimum after 96 and 168 hours exposure to temperature and humidity. The insulation resistance may fall below 1×10^8 ohms at 24 hours provided it recovers by 96 hours. Any reason for deleting values (scratches, condensation, bridged conductors, outlying points, etc.) must be noted. Rejection of results for more than 2 combs for a given condition shall require the test to be repeated.

The specimens shall also be examined for dendritic growth or corrosion at 10X to 30X magnification with backlighting within 24 hours of completing the testing. Dendritic growth that spans 25% or more of the original spacing will constitute a failure.

If the control coupon readings are less than 1×10^9 ohms after 96 or 168 hours exposure to temperature and humidity, a new set of test coupons shall be obtained and the entire test repeated.

TEST SPECIMENS:

Three (3) IPC-B-24 test coupons were used for the solder paste flux being tested. Three (3) IPC-B-24 unprocessed test coupons were used as controls. For testing purposes, the stenciled and reflowed boards were identified as Trace #1, Trace #2, and Trace #3. The control boards were identified as Trace Control #1, Trace Control #2, and Trace Control #3.

SAMPLE PREPARATION:

The test coupons were scrubbed with a soft bristle brush for 60 seconds under running deionized water. The coupons were then rinsed thoroughly with 2-propanol and dried in an oven for 2 hours at 50°C.

A 0.2 mm thick stencil was used to print the sample solder paste onto three (3) of the clean test coupons. The printed coupons were preheated in an oven at 150°C for three (3) minutes, and then placed in a forced air oven at 270°C for 105 seconds to reflow the solder paste.

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METHOD:

Teflon coated wires were attached to the terminal areas of the IPC-B-24 coupons with rosin (R) flux and solid core solder wire. Aluminum foil was used to protect the comb patterns from flux spitting during the soldering process. The flux residues were not removed from the terminal areas.

The coupons were placed in an environmental chamber in a vertical position such that air flow was parallel to the board surfaces, with at least ½ inch spacing between coupons. The chamber was set to 85±2°C and 20% RH and allowed to stabilize for 3 hours. The humidity was then ramped to 85±2 % over a 30 minute period. The coupons were allowed to equilibrate for two hours before applying the bias voltage to begin the test. A bias of +50 volts DC was applied to all test coupons.

At 24, 96, and 168 hours, insulation resistance measurements were made with -100 volts DC applied to comb patterns A, B, C, and D of each coupon. The measurement voltage was opposite in polarity to the bias voltage.

RESULTS:

The individual insulation resistance measurements for the solder paste are attached.

The tested patterns were examined under 10X to 30X magnification with backlighting. The following was observed:

- No dendritic growth or corrosion was present on any of the boards tested.

The solder paste flux met the ANSI/J-STD-004 (1995) electrical and visual requirements for Surface Insulation Resistance in the uncleaned state.

Trace Laboratories-East certifies that the test equipment used complies with the calibration test purposes of ISO 10012-1, ANSI/NCSL Z540-1-1994, and MIL-STD-45662A and that the data contained in this report is accurate within the tolerance limitation of this equipment.

All test procedures detailed within this report are complete. The results in this report relate only to those items tested. If any additional information or clarification of this report is required, please contact us. This test report shall not be reproduced except in full, without the written approval of Trace Laboratories-East.

The test methods used within this report may or may not be covered by Trace's A2LA scope of accreditation. A2LA technical questions may be addressed to the Quality Manager.

Thank you for selecting Trace Laboratories-East for your testing purposes.

PERFORMED BY:

Melissa A. Moore
Chemist

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Attachments: Surface Insulation Resistance Data Sheet (1)

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DATA SECTION

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SURFACE INSULATION RESISTANCE DATA

- Surface Insulation Resistance Data Sheet – 24, 96 and 168 hours measurements of samples and controls (1)

SIR per ANSI/J-STD-004 (1995) and IPC-TM-650, 2.6.3.3 A

All insulation resistance measurements are expressed in ohms.

Sample I.D.	Pattern	Initials	24 Hours	96 hours	168 hours
Trace #1	A	1.05E+13	1.41E+13	1.51E+13	7.59E+11
	B	1.12E+13	7.76E+09	6.46E+09	1.82E+09
	C	1.07E+13	1.48E+13	1.51E+13	3.02E+09
	D	1.07E+13	1.48E+13	6.46E+09	2.69E+09
Trace #2	A	1.12E+13	1.48E+13	4.47E+09	2.95E+09
	B	1.20E+13	5.75E+09	5.89E+09	5.75E+09
	C	1.20E+13	8.51E+09	3.55E+09	4.37E+09
	D	1.26E+13	7.94E+09	3.31E+09	3.72E+09
Trace #3	A	1.05E+13	1.38E+10	4.57E+09	3.63E+09
	B	1.07E+13	1.82E+10	6.46E+09	5.25E+09
	C	1.10E+13	1.66E+10	7.24E+09	6.17E+09
	D	1.10E+13	1.15E+10	3.55E+09	2.88E+09
Trace Control #1	A	1.10E+13	9.12E+09	8.13E+09	8.71E+09
	B	1.10E+13	9.12E+09	7.59E+09	8.51E+09
	C	1.10E+13	1.02E+10	6.92E+09	7.76E+09
	D	1.10E+13	1.12E+10	7.59E+09	8.13E+09
Trace Control #2	A	1.10E+13	1.00E+10	8.13E+09	8.71E+09
	B	1.10E+13	1.20E+10	7.76E+09	8.51E+09
	C	1.12E+13	1.32E+10	7.94E+09	8.51E+09
	D	1.12E+13	1.32E+10	8.51E+09	8.91E+09
Trace Control #3	A	1.12E+13	1.00E+10	7.24E+09	8.13E+09
	B	1.15E+13	8.91E+09	7.24E+09	8.51E+09
	C	1.15E+13	9.55E+09	6.17E+09	7.76E+09
	D	1.17E+13	1.07E+10	6.76E+09	7.94E+09