



THE AMERICAN ASSOCIATION FOR  
LABORATORY ACCREDITATION

## ACCREDITED LABORATORY

A2LA has accredited

**TRACE LABORATORIES, INC.**  
**Hunt Valley, MD**

for technical competence in the field of

### **Mechanical Testing**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).



Presented this 9<sup>th</sup> day of April 2009.

*Peter Abney*

\_\_\_\_\_  
President

For the Accreditation Council

Certificate Number 1251.01

Valid to December 31, 2010

For the tests or types of tests to which this accreditation applies,  
please refer to the laboratory's Mechanical Scope of Accreditation.

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

TRACE LABORATORIES, INC.  
5 North Park Drive  
Hunt Valley, MD 21030  
Mrs. Sarah D. Brammer Phone: 410 584 9099

MECHANICAL

Valid To: December 31, 2010

Certificate Number: 1251.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests:

<u>Test</u>	<u>Test Method</u>
Abrasion-Taber	IPC-TM-650, 2.4.27.1
Adhesion Plating	IPC-TM-650, 2.4.1 MIL-P-50884 MIL-P-55110 MIL-PRF-31032 MIL-PRF-55110
Finish	DELPHI/DELCO Q-1000, Method 116
Autoclave (Pressure Pot)	DELPHI/DELCO Q-1000, Method 107 IPC-TM-650, 2.6.16
Bond Strength	ASTM D1002 IPC-TM-650, 2.4.21 MIL-P-50884 MIL-P-55110 MIL-PRF-31032 MIL-PRF-55110 MIL-STD-883, 5011 UL796
Bow and Twist	IPC-4101 IPC-TM-650, 2.4.22.1 MIL-P-50884 MIL-P-55110 MIL-PRF-31032 MIL-PRF-55110
Compression	ASTM D695

<u>Test</u>	<u>Test Method</u>
Conformal Coat Compatibility	DELPHI/DELCO Q-1000, Method 232, FAST and EASY COMPONENT TEST
Durability of Finish Coatings	DELPHI/DELCO Q-1000, Method 219, Method B
Elongation	ASTM E8 ASTM E345
Failure Analysis (using SEM/EDS and other techniques)	Trace Method O-17
Flammability	ASTM D635 ASTM D3801 ASTM D4804 ASTM D5048 DELPHI/DELCO Q-1000, Method 120 FED-STD-406, Method 2021 IPC-4101 IPC-TM-650, 2.3.9 IPC-TM-650, 2.3.10 MIL-I-46058 MIL-STD-202, Method 111 UL94 except section 10 UL1694
Flexibility Endurance	MIL-P-50884
Flexural Strength	IPC-4101 IPC-TM-650, 2.4.4 IPC-TM-650, 2.4.4.1
Folding Flexibility	FED-STD-141, Method 6221 MIL-I-46058 MIL-P-50884
Fungus (Non-nutrient)	ASTM G21 IPC-4101 IPC-SM-840 IPC-TM-650, 2.6.1, 2.6.1.1 MIL-I-46058 MIL-STD-810
Gel Time	IPC-4101 IPC-TM-650, 2.3.18

<u>Test</u>	<u>Test Method</u>
Hardness-Pencil	ASTM D3363 IPC-SM-840 IPC-TM-650, 2.4.27.2
Durometer Hardness-Shore (A, D, O)	ASTM D2240
Microhardness-Vickers, Knoop	ASTM E92 and E384 ASTM E384
Heat Deflection Temperature	ASTM D648
High/Low Temperature (-170°C to +1200°C)	MIL-STD-202, Method 108
High Temperature Storage	DELPHI/DELCO Q-1000, Method 100
Humidity (10% to 98%)	AT&T MS-586000 DELPHI/DELCO Q-1000, Method 105 DELPHI/DELCO Q-1000, Method 106 FORD WSF-M22P2-A-91 MIL-I-46058
Hydrolytic Stability	IPC-CC-830 IPC-SM-840 IPC-TM-650, 2.6.11 MIL-I-46058
Izod Impact	ASTM D256 ASTM D4812
Lap Shear	ASTM D1002
Melting Point	ASTM E794
Microscopic Evaluation	IPC-TM-650, 2.1.1 MIL-P-50884 MIL-P-55110 MIL-PRF-31032 MIL-PRF-55110 NPS-25001
Microsectioning (as Received)	DELPHI/DELCO Cross Section Analysis IPC-TM-650, 2.1.1 MIL-P-50884 MIL-P-55110 MIL-PRF-31032

<u>Test</u>	<u>Test Method</u>
Microsectioning (as Received)	MIL-PRF-55110 NPS-25001
Peel Strength	IPC-4101 IPC-TM-650, 2.4.8 IPC-TM-650, 2.4.8.1 IPC-TM-650, 2.4.8.2 IPC-TM-650, 2.4.8.3 MIL-P-50884 MIL-P-55110 MIL-PRF-31032 MIL-PRF-55110
Photomicrography SEM Optical	Trace Equipment Manuals
Propagation Tear	ASTM D1938 IPC-TM-650, 2.4.17
Rework Simulation	IPC-TM-650, 2.4.36 MIL-P-50884 MIL-P-55110 MIL-PPR-31032 MIL-PRF-55110
Salt Spray (Fog)	ASTM B117
Shear Strength	ASTM D1002 ASTM D3528
Shock Thermal, Air to Air and/or Liquid to Liquid Shock (-75°C to +180°C)	IPC-SM-840 IPC-TM-650, 2.6.7.1 IPC-TM-650, 2.6.7.2 MIL-I-46058 MIL-P-50884 MIL-P-55110 MIL-PRF-31032 MIL-PRF-55110 MIL-STD-202, Method 107 NPS-25001
Solder Shock	MIL-STD-202, Method 210

<u>Test</u>	<u>Test Method</u>
Solderability	DELPHI/DELCO Q-1000, Method 202 J-STD-003 IPC-4101 IPC-SM-840 MIL-P-50884 MIL-P-55110 MIL-PRF-31032 MIL-PRF-55110 NPS-25001
Spread/Slump	IPC-TM-650, 2.4.35 J-STD-005
Steam Aging	J-STD-002 J-STD-003
Tack	IPC-TM-650, 2.4.44 J-STD-005
Tear Resistance	ASTM D1004 IPC-TM-650, 2.4.16
Temperature Cycling (-75°C to +180°C)	DELPHI/DELCO Q-1000, Method 101 MIL-I-46058 MIL-STD-202, Method 107
Tensile (- 170°C to +425°C) (10,000 lbs. Max)	ASTM D638 ASTM E8 ASTM E345 IPC-TM-650, 2.4.18
Tensile Impact	ASTM D1822
Thermal Aging	MIL-I-46058 MIL-STD-202, Method 108
Thermal Stress	IPC-4101 IPC-TM-650, 2.4.13.1 IPC-TM-650, 2.6.8 MIL-P-50884 MIL-P-55110 MIL-PRF-31032 MIL-PRF-55110 NPS-25001

<u>Test</u>	<u>Test Method</u>
Thickness	IPC-4101 IPC-TM-650, 2.1.6 IPC-TM-650, 2.3.11 MIL-I-46058 ASTM D1005
Visual Examination	AT&T MS-586000 DELPHI/DELCO Q-1000, Method 105 DELPHI/DELCO Q-1000, Method 106 DELPHI/DELCO Q-1000, Method 201 FORD WSF-M22P2-A-91 IPC-A-600 IPC-A-610 IPC-4101 IPC-TM-650, 2.1.5 IPC-TM-650, 2.1.10 MIL-I-46058 MIL-P-50884 MIL-P-55110 MIL-PRF-31032 MIL-PRF-55110
Water/Moisture Absorption	ASTM D570 IPC-4101 IPC-TM-650, 2.6.2 IPC-TM-650, 2.6.2.1
Water Immersion	DELPHI/DELCO Q-1000, Method 113
Water Vapor Transmission	ASTM E96
X-Ray Radiography	IPC-TM-650, 2.6.10 MIL-STD-750D, 2076.2 MIL-STD-883F, 2012.7
Small Parts	ASTM F963 (para 4.6); 16CFR; 1500.18 (a)(9), 1501, 1500.51 (excluding 1500.51(c)), 1500.52 (excluding 1500.52(c))

On the following products or materials:

Adhesives & Sealants; Aircraft Components; Automotive Components; Ceramics; Coatings; Metals & Alloys; Plastic & Rubber Products; Circuit Boards & Circuit Board Components

Facility studies performed according to IPC-QL-653A "Certification of Facilities that Inspect/Test Printed Boards, Components and Materials."