SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

NTS Labs, LLC Baltimore
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MECHANICAL

Valid To: December 31, 2024 Certificate Number: 0214.35

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests on the following product types: Aerospace, Automotive, Avionics, Consumer Products, Electronics, Industrial, Medical, Military Telecommunication and Textiles.

Test Technology:	**Test Method(s)[1]:**
Plating Adhesion	IPC-TM-650 (Method 2.4.1)
Strength/Compression (Bond Strength, Lap Shear Strength, Shear Strength, Compression/Compression Strength, Tension/Tensile Strength, Tack, Tear Strength, Tear Resistance, Propagation Tear, Peel Strength, Scratch Resistance) Range: Up to 22,500 lbs (-170 to 425) °F	ASTM D638; IPC-TM-650 (Methods 2.4.8, 2.4.8.1, 2.4.18, 2.4.18.1, 2.4.21); MIL-STD-883, Method 5011
Bow and Twist/Warpage	IPC-TM-650 (Methods 2.4.22 and 2.4.22.1)
Failure Analysis using Techniques Included in Method O-17 or in the Chemical, Electrical and/or Mechanical Scope	BAL O-17[2]
Electronic Part Authenticity Testing/Counterfeit Detection	BAL O-27[2]; SPOC-419 (*Excluding Paragraphs 9 to 13*)
Flammability	UL 94 (Sections 7 and 8)
Flexibility Endurance/Folding Flexibility	IPC-TM-650 (Method 2.4.3); MIL-P-50884[3]
Fungus Resistance (Non-Nutrient Growth)	ASTM G21; IPC-TM-650 (Methods 2.6.1 and 2.6.1.1); MIL-STD-810; MIL-I-46058[2] Amendment 7 (Sections 3.7 and 4.8.4)

Test Technology:	**Test Method(s)[1]:**
Hardness (Pencil, Shore A, Shore D, Shore O, Knoop, Vickers, Barcol Hardness)	ASTM D3363; ASTM D2240; ASTM E92; ASTM E384; ASTM D2583; IPC-TM-650 (Method 2.4.27.2)
Corrosion of Flux using Temperature/Humidity Chamber	IPC-TM-650 (Method 2.6.15)
Hydrolytic Stability/Temperature/Humidity Aging	IPC-TM-650 (Methods 2.6.11 and 2.6.11.1); MIL-I-46058[3]; IPC-SM-840; IPC-CC-830
Life at Elevated Ambient Temperature	MIL-STD-202, Method 108
Microscopic Evaluation/Visual Examination/ Microsection Analysis (Cross-Section) (3 to 1,000x)	IPC-TM-650 (Methods 2.1.1, 2.1.2, 2.1.5, and 2.1.10)
Outgassing	ASTM E595
Thermal Diffusivity	ASTM E1461
Thickness – Micrometer	ASTM D1005 (Methods C and D); MIL-I-46058[3]
Goniometer/Hydrophobic Contamination/ Contact Angle/Surface Wettability	ASTM C813; ASTM D7334
Ultraviolet Exposure	ASTM G154
Xenon Arc Exposure	ASTM G155
Shock (Thermal Shock, Air-to-Air, Thermal Cycling, Temperature Cycling, Rapid Change of Temperature) Range: (-75 to 180) °C	IPC-TM-650 (Methods 2.6.7, 2.6.7.1, and 2.6.7.2 Revision B); MIL-STD-202, Method 107
Solderability/Steam Aging	IPC-J-STD-002; IPC-J-STD-003
Rework Simulation/Thermal Stress/ Solder Shock/Resistance to Soldering Heat	IPC-TM-650 (Methods 2.4.13.1, 2.4.36, and 2.6.8); MIL-STD-202, Method 210
Water Absorption/Moisture Absorption	ASTM D570; IPC-TM-650 (Methods 2.6.2 and 2.6.2.1)
Water Vapor Transmission	ASTM E96
X-Ray Radiography	BAL SOP O-3

Test Technology:	**Test Method(s)[1]:**
Instrumental Color Difference Measurements for Exterior Finishes, Textiles, and Colored Trim	SAE J1545; ASTM D2244
Dry and Pry/Dye and Pull	IPC-TM-650 (Method 2.4.53)

Supporting the following documents: IPC-SM-840, IPC-CC-830, IPC-6012, IPC-6013, IPC-6018, MIL-A-28870, MIL-I-46058, MIL-P-50884, MIL-PRF-31032, MIL-PRF-55110, IPC-J-STD-004, IPC-J-STD-005

This laboratory also uses customer supplied specifications and/or methods directly related to the testing technologies and parameters listed above.

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

[1] When the date, edition, version, etc. is not identified in the scope of accreditation, laboratories may use the version that immediately precedes the current version for a period of one year from the date of publication of the standard measurement method, per part C., Section 1 of A2LA *R101 - General Requirements- Accreditation of ISO-IEC 17025 Laboratories*.

[2] In-house Test Method.

[3] This laboratory's scope contains withdrawn or superseded methods. As a clarifier, this indicates that the applicable method itself has been withdrawn or is now considered "historical" and not that the laboratory's accreditation for the method has been withdrawn.

Accredited Laboratory

A2LA has accredited

NTS LABS, LLC BALTIMORE

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 17025:2017 *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 April 2017*).

Presented this 5th day of June 2023.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 0214.35
Valid to December 31, 2024

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