



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

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MECHANICAL

Valid To: July 31, 2012

Certificate Number: 0096.01

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

<u>Test Method:</u>	<u>Test Title:</u>	<u>Building No.:</u>
ASTM B117	Practice for Operating Salt Spray (Fog) Testing Apparatus	2
ASTM B368	Test Method for Copper-Accelerated Acetic Acid-Salt Spray (Fog) Testing (CASS Test)	2
ASTM B487	Test Method for Metal and Oxide Coating Thickness by Microscopical Examination of a Cross Section	2
ASTM C271	Test Method for Density of Sandwich Core Materials	1 & 2
ASTM C273	Test Method for Shear Properties in Flatwise Plane of Flat Sandwich Constructions or Sandwich Cores	1 & 2
ASTM C297	Test Method for Tensile Strength of Flat Sandwich Constructions in Flatwise Plane	1 & 2
ASTM C364	Test Method for Edgewise Compressive Strength of Flat Sandwich Constructions	1 & 2
ASTM C365	Test Methods for Flatwise Compressive Strength of Sandwich Cores	1 & 2
ASTM C393	Test Method for Flexural Properties of Flat Sandwich Constructions	1 & 2
ASTM C1166	Test Method for Flame Propagation of Dense and Cellular Elastomeric Gaskets and Accessories	2
ASTM D149	Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies	1
ASTM D150	Test Methods for A-C Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulating Materials	1
ASTM D256	Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics	1
ASTM D257	Test Methods for D-C Resistance or Conductance of Insulating Materials	1 & 2
ASTM D395	Test Methods for Rubber Property-Compression Set (Method B)	1 & 2
ASTM D412	Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers- Tension	1 & 2
ASTM D471	Test Method for Rubber Property-Effect of Liquids (Section 15 only)	1 & 2
ASTM D495	Test Method for High-Voltage, Low-Current, Dry Arc-Resistance of Solid Electrical Insulation	1
ASTM D570	Test Method for Water Absorption of Plastics	1 & 2
ASTM D575	Test Methods for Rubber Properties in Compression	1 & 2
ASTM D618	Conditioning of Plastics for Testing	1 & 2

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<u>Test Method:</u>	<u>Test Title:</u>	<u>Building No.:</u>
ASTM D624	Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers (Die B & C)	1 & 2
ASTM D621-64(88)	Test Methods for Deformation of Plastics Under Load (Withdrawn 1994)	1
ASTM D635	Test Method for Rate of Burning and/or Extent and Time Burning of Self-Supporting Plastics in a Horizontal Position	2
ASTM D638	Test Method for Tensile Properties of Plastics	1 & 2
ASTM D695	Test Method for Compressive Properties of Rigid Plastics	1 & 2
ASTM D732	Test Method for Shear Strength of Plastics by Punch Tool	1 & 2
ASTM D746	Test Method for Brittleness Temperature of Plastics and Elastomers by Impact	1
ASTM D785	Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials	2
ASTM D790	Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials	1 & 2
ASTM D792	Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement (Method A)	1
ASTM D877	Test Method for Dielectric Breakdown Voltage of Insulating Liquids Using Disk Electrodes	1
ASTM D882	Test Methods for Tensile Properties of Thin Plastic Sheet	1 & 2
ASTM D903	Test Method for Peel or Stripping Strength of Adhesive Bonds	1 & 2
ASTM D924	Test Method for Dissipation Factor (or Power Factor) and Relative Permittivity (Dielectric Constant) or Electrical Insulating Liquids	1
ASTM D952	Test Method for Bond or Cohesive Strength of Sheet Plastics and Electrical Insulating Materials	1 & 2
ASTM D953	Test Method for Bearing Strength of Plastics	1 & 2
ASTM D991	Test Method for Rubber Property-Volume Resistivity of Electrically Conductive and Antistatic Products	1
ASTM D1002	Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal)	1 & 2
ASTM D1004	Test Method for Initial Tear Resistance of Plastic Film and Sheet	1 & 2
ASTM D1043	Test Method for Stiffness Properties of Plastics as a Function of Temperature by Means of a Torsion Test	1
ASTM D1169	Test Method for Specific Resistance (Resistivity) of Electrical Insulating Liquids	1
ASTM D1238	Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer	1
ASTM D1621	Test Method for Compressive Properties of Rigid Cellular Plastics	1 & 2
ASTM D1622	Test Method for Apparent Density of Rigid Cellular Plastics	1 & 2
ASTM D1708	Test Method for Tensile Properties of Plastics by Use of Microtensile Specimens	1 & 2
ASTM D1781	Test Method for Climbing Drum Peel for Adhesives	1 & 2
ASTM D1876	Test Method for Peel Resistance of Adhesives (T-Peel Test)	1 & 2
ASTM D2095	Test Method for Tensile Strength of Adhesives by Means of Bar and Rod Specimens	1 & 2
ASTM D2137	Test Methods for Rubber Property-Brittleness Point of Flexible Polymers and Coated Fabrics	1
ASTM D2240	Test Method for Rubber Property-Durometer Hardness	1
ASTM D2295	Test Method for Strength Properties of Adhesives in Shear by Tension Loading at Elevated Temperatures (Metal-to-Metal)	1 & 2
ASTM D2344	Test Method for Apparent Interlaminar Shear Strength of Parallel Fiber Composites by Short-Beam Method	1 & 2
ASTM D2520	Test Method for Complex Permittivity (Dielectric Constant) of Solid Electrical Insulating Materials at Microwave Frequencies and Temperatures to 1650 °C	1

<u>Test Method:</u>	<u>Test Title:</u>	<u>Building No.:</u>
ASTM D2557	Test Method for Tensile-Shear Strength of Adhesives in the Subzero Temperature Range from (-267.8 to -55) °C or (-450 to -67) °F	1 & 2
ASTM D2583	Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor	1
ASTM D2584	Test Method for Ignition Loss of Cured Reinforced Resins	2
ASTM D2843	Test Method for Density of Smoke from the Burning or Decomposition of Plastics	2
ASTM D2919	Test Method for Determining Durability of Adhesive Joints Stressed in Shear by Tension Loading	1 & 2
ASTM D3039	Test Method for Tensile Properties of Polymer Matrix Composite Materials	1 & 2
ASTM D3163	Test Method for Determining Strength of Adhesively Bonded Rigid Plastic Lap-Shear Joints in Shear by Tension Loading	1 & 2
ASTM D3164	Test Method for Strength Properties of Adhesively Bonded Plastic Lap-Shear Sandwich Joints in Shear by Tension Loading	1 & 2
ASTM D3165	Test Method for Strength Properties of Adhesives in Shear by Tension Loading of Single-Lap-Joint Laminated Assemblies	1 & 2
ASTM D3167	Test Method for Floating Roller Peel Resistance of Adhesives	1 & 2
ASTM D3171	Test Method for Fiber Content of Resin-Matrix Composites by Matrix Digestion (Method A, B, F & G)	1
ASTM D3330	Test Method for Peel Adhesion of Pressure-Sensitive Tape	1 & 2
ASTM D3359	Test Methods for Measuring Adhesion by Tape Test	1
ASTM D3386-00	Test Method of Coefficient of Linear Thermal Expansion of Electrical Insulating Materials (withdrawn 2005)	1
ASTM D3410	Test Method for Compressive Properties of Polymer Matrix Composite Materials with Unsupported Gage Section by Shear Loading	1
ASTM D3417-99	Test Method for Enthalpies of Fusion and Crystallization of Polymers by Differential Scanning Calorimetry (DSC) (withdrawn 2004)	1
ASTM D3418	Test Method for Transition Temperatures of Polymers by Thermal Analysis	1
ASTM D3479	Test Methods for Tension-Tension Fatigue of Oriented Fiber, Resin Matrix Composites	2
ASTM D3518	Practice for In-Plane Shear Stress-Strain Response of Unidirectional Polymer Matrix Composite Materials by Tensile Test of ±45 Laminate	1 & 2
ASTM D3528	Test Method for Strength Properties of Double Lap Shear Adhesive Joints by Tension Loading	1 & 2
ASTM D3529	Test Method for Resin Solids Content of Epoxy-Matrix Prepreg by Matrix Dissolution	1
ASTM D3530	Test Method for Volatiles Content of Epoxy-Matrix Prepreg	1 & 2
ASTM D3531	Test Method for Resin Flow of Carbon Fiber-Epoxy Prepreg	1 & 2
ASTM D3532	Test Method for Gel Time of Carbon Fiber-Epoxy Prepreg	1 & 2
ASTM D3846	Test Method for In-Plane Shear Strength of Reinforced Plastics	1 & 2
ASTM D3850	Test Method for Rapid Thermal Degradation of Solid Electrical Insulating Materials by Thermogravimetric Method	1
ASTM D4255	Guide for Testing In-Plane Shear Properties of Composite Laminates	1
ASTM D4475	Test Method for Apparent Horizontal Shear Strength of Pultruded Reinforced Plastic Rods by the Short-Beam Method	1 & 2
ASTM D4496	Test Method for D-C Resistance or Conductance of Moderately Conductive Materials	1
ASTM D4591	Test Method for Determining Temperatures and Heats of Transitions of Fluoropolymers by Differential Scanning Calorimetry	1
ASTM D5379	Test Method for Shear Properties of Composite Materials by the V-Notched Beam Method	1 & 2

<u>Test Method:</u>	<u>Test Title:</u>	<u>Building No.:</u>
ASTM D5083	Tensile Properties of Reinforced Thermosetting Plastics Using Straight Sided Specimens	2
ASTM D5420	Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact)	1
ASTM D5467	Test Method for Compressive Properties of Unidirectional Polymer Matrix Composites Using a Sandwich Beam	1 & 2
ASTM D5528	Mode I Interlaminar Fracture Toughness of Unidirectional Fiber Reinforced Polymer Matrix Composite	1 & 2
ASTM D5656	Test Method for Thick Adherent Metal Lap-Shear Joints for Determination of the Stress-Strain Behavior of Adhesives in Shear by Tension Loading	1 & 2
ASTM D5766	Open Hole Tensile Strength of Polymer Matrix Composite Laminates	1 & 2
ASTM D5961	Test Method for Bearing Response of Polymer Matrix Composite Laminates	1 & 2
ASTM D6110	Test Method for Determining the Charpy Impact Resistance of Notched Specimens of Plastics	1
ASTM D6272	Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials by Four-Point Bending	1 & 2
ASTM D6415	Test Method for Measuring the Curved Beam Strength of a Fiber Reinforced Polymer Composite	1 & 2
ASTM D6484	Test Method for Open-Hole Compressive Strength of Polymer Matrix Composite Laminates	2
ASTM D6742	Filled Hole Tension and Compression Testing of Polymer Matrix Composites	2
ASTM D6641	Test Method for Determining the Compressive Properties of Polymer Matrix Composite Laminate Using a Combined Loading Compression (CLC) Test Fixture	1 & 2
ASTM D6671	Mixed Mode I-Mode II Interlaminar Fracture Toughness of Unidirectional Fiber Reinforced Polymer Matrix Composites	1 & 2
ASTM D7028	Test Method for Glass Transition Temperature (DMA Tg) of Polymer Matrix Composites by Dynamic Mechanical Analysis (DMA)	1
ASTM D7078	Test Method for Shear Properties of Composite Materials by V-Notched Rail Shear Method	1 & 2
ASTM D7136	Test Method for Measuring the Damage Resistance of a Fiber-Reinforced Polymer Matrix Composite to a Drop-Weight Impact Event	2
ASTM D7137	Test Method for Compressive Residual Strength Properties of Damaged Polymer Matrix Composite Plates	2
ASTM D7249	Test Method for Facing Properties of Sandwich Constructions by Long Beam Flexure	1 & 2
ASTM D7291	Test Method for Through-Thickness "Flatwise" Tensile Strength and Elastic Modulus of a Fiber-Reinforced Polymer Matrix Composite Material	2
ASTM D7332	Test Method for Measuring the Fastener Pull-Through Resistance of a Fiber-Reinforced Polymer Matrix Composite	1 & 2
ASTM E3	Practice for Preparation of Metallographic Specimens	2
ASTM E662	Test Method for Specific Optical Density of Smoke Generated by Solid Materials	2
ASTM E831	Test method for Linear Thermal Expansion of Solid Materials by Thermomechanical Analysis	1
ASTM E1131	Test Method for Compositional Analysis by Thermogravimetry	1
ASTM E1269	Determining Specific Heat Capacity by DSC	1
ASTM E1356	Test Method for Glass Transition Temperatures by Differential Scanning Calorimetry or Differential Thermal Analysis (DSC Only)	1
ASTM E1545	Test Method for Assignment of the Glass Transition Temperature by Thermomechanical Analysis	1

<u>Test Method:</u>	<u>Test Title:</u>	<u>Building No.:</u>
ASTM E1640	Test Method for Assignment of the Glass Transition Temperature by DMA	1
ASTM F814-84b	Test Method for Specific Optical Density of Smoke Generated by Solid Materials for Aerospace Applications (Withdrawn 1995)	1
ASTM G85 (A1)	Practice of Modified Salt Spray (Fog) Testing	2
ASTM G154	Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials	1
DIN EN 2564	Aerospace Series-Carbon Fibre Laminates – Determination of Fibre, Resin, and Void Contents	1
DIN EN 2850	Aerospace Series Carbon-Fibre Thermosetting Resin Unidirectional Laminates – Compression Test Parallel to the Fibre Direction	1 & 2
EN ISO 527	Plastics – Determination of Tensile Properties	1 & 2
EN ISO 14125	Fibre-reinforced Plastic Composites – Determination of the Flexural Properties	1 & 2
ISO 14126	Fibre-Reinforced Plastic Composites – Determination of Compressive Properties in the In-Plane Direction	1 & 2
ISO 14129	Fibre-Reinforced Plastic Composites – Determination of the In-Plane Shear Strain Response, including the In-Plane Shear Modulus and Strength by the $\pm 45$ Tension Test Method	1 & 2
ISO 1887	Determination of Combustible-Matter Content	2
<u>DOT:</u>		
DOT MVSS 302	Department of Transportation Motor Vehicle Safety Standard Flammability of Interior Materials	2
<u>FAA:</u>		
FAR 25.853	Airworthiness Standards: Transport Category Airplanes, Fire Protection, Compartment Interiors, Appendix F, Part I, IV, and V	2
<u>NASA:</u>		
1092	Standard Tests for Toughened Resin Composites	2
1142	NASA/Aircraft Industry Standard Specification for Graphite Fiber-Toughened Thermoset Composite Materials	2
<u>Boeing:</u>		
BSS 7230	Determination of Flammability Properties of Aircraft Materials	2
BSS 7238	Test Method for Smoke Generation by Materials on Combustion	2
BSS 7239	Test Method for Toxic Gas Generation by Materials on Combustion	2
BSS 7322	Boeing Specification Support Standard, Ohio State University Calorimeter Heat Release, Determination of	2
<u>Airbus:</u>		
ABD 0031	Fireworthiness Requirements Pressurized Section of Fuselage	2
AITM 2.0002	Flammability of Non-metallic Materials,- Small Burner Test, Vertical	2
AITM 2.0003	Flammability of Non-metallic Materials,- Small Burner Test, Horizontal	2

<u>Test Method:</u>	<u>Test Title:</u>	<u>Building No.:</u>
<u>Airbus (continued):</u>		
AITM 2.0004	Flammability of Non-Metallic Materials,- Small Burner Test, 45 degree	2
AITM 2.0005	Flammability of Non-Metallic Materials,- Small Burner Test, 60 degree	2
AITM 2.0006	Determination of Heat Release Rate of Aircraft Materials	2
AITM 2.0007	Determination of Specific Optical Smoke Density of Aircraft Interior Materials	2
AITM 2.0008	Determination of Specific Optical Smoke Density of Wire/Cable Insulation	2
AITM 2.0038	Flammability of Heat Shrinkable Tubing's,- Small Burner Test, 60 degree	2
AITM 3.0005	Determination of Specific Gas Components of Smoke Generated by Non-Metallic Aircraft Materials inside the Pressurized Section of Fuselage	2
<u>Military Standards:</u>		
MMM-A-132	Federal Specification, Adhesives, Heat Resistant, Airframe Structural, Metal-to-Metal (Except Creep)	1 & 2
MIL-STD-810	Environmental Engineering Considerations and Laboratory Tests:	
Method 501	High Temperature	1 & 2
Method 502	Low Temperature	1 & 2
Method 503	Thermal Shock	1
Method 507	Humidity	1 & 2
Method 509	Salt Fog	2
Method 514	Vibration (Selected Methods)	1
Method 516	Shock	1
MIL-STD-202	Test Methods for Electronic and Electrical Component Parts:	
Method 101	Salt Atmosphere (Corrosion)	2
Method 103	Humidity (Steady State)	1 & 2
Method 104	Immersion (Method A)	1 & 2
Method 106	Moisture resistance	1 & 2
Method 107	Thermal shock	1
Method 108	Life (at Elevated Ambient Temperature)	1
Method 201	Vibration	1
Method 204	Vibration, High Frequency	1
Method 301	Dielectric Withstanding Voltage	1
Method 302	Insulation Resistance	1
Method 303	DC Resistance	1
Method 306	Quality Factor (Q)	1
Method 307	Contact Resistance	1

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SACMA (Suppliers of Advanced Composite Materials Association):

SRM 1-94	Compressive Properties of Oriented Fiber-Resin Composites	1 & 2
SRM 2-94	Compression After Impact Properties of Oriented Fiber-Resin Composites	2
SRM 3-94	Open-Hole Compression Properties of Oriented Fiber-Resin Composites	1 & 2
SRM 4-94	Tensile Properties of Oriented Fiber-Resin Composites	1 & 2
SRM 5-94	Open-Hole Tensile Properties of Fiber-Resin Composites	1 & 2
SRM 6-94	Compressive Properties of Oriented Cross-Plied Fiber-Resin Composites	1 & 2
SRM 7-94	In-Plane Shear Stress-Strain Properties of Oriented Fiber-Resin Composites	1 & 2
SRM 8-94	Short Beam Shear Strength of Oriented Fiber-Resin Composites	1 & 2
SRM 9-94	Tensile Properties of Oriented Cross-Plied Fiber-Resin Composites	1 & 2
SRM 10-94	Fiber Volume, Percent Resin Volume and Calculated Average Cured Ply Thickness of Plied Laminates	1
SRM 11R-94	Environmental Conditioning of Composite Test Laminates	1 & 2
SRM 18R-94	Glass Transition Temperature (T <sub>g</sub> ) Determination By DMA	1
SRM 21R-94	Fluid Resistance Evaluating of Composite Materials	1 & 2
SRM 22R-94	Determining the Resin Flow of Preimpregnated "B" Staged Material	2
SRM 23R-94	Determination of Resin Content and Fiber Areal Weight of Thermoset Prepreg with Destructive Techniques	1 & 2
SRM 25R-94	Onset Temperature and Peak Temperature for Composite Resin Systems Using Differential Scanning Calorimetry (DSC)	1

IPC:

IPC-6012	Qualification and Performance Specification for Rigid Printed Boards (Except 2.1.1.2A, 2.3.15D, 2.5.5.7A, 2.6.1F, 2.6.4B)	1 & 2
IPC-6013	Qualification and Performance Specification for Flexible Printed Boards (Except 2.1.1.2, 2.3.15, 2.3.39, 2.5.5.7, 2.6.1, 2.6.4)	1 & 2
IPC-CC-830	Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies (Except FT-IR) (Except 2.3.42, 2.6.1.1)	1 & 2
IPC J-STD-003	Solderability Tests for Printed Boards (Test A)	2
IPC-TM 650	Test Methods Manual	1 & 2

IPC-TM-650 Test Methods:

2.1.1	Microsectioning	2
2.1.1.1	Microsectioning, Ceramic Substrate	2
2.1.6	Thickness of Glass Fabric	2
2.1.6.1	Weight of Fabric Reinforcements	1
2.1.7	Thread Count of Glass Fabric (Method A)	1
2.1.7.1	Thread Count, Organic Fibers	1
2.1.8	Workmanship	1 & 2
2.2.1	Mechanical Dimensional Verification	1 & 2
2.2.2	Optical Dimensional Verification	1 & 2

Test Method:      Test Title:      Building No.:

IPC-TM-650 Test Methods (cont.):

2.2.4	Dimensional Stability, Flexible Dielectric Materials	1
2.2.5	Dimensional Inspections Using Microsections	2
2.2.12.2	Weight and Thickness of Copper Foils with Releasable Carriers	1
2.2.12.3	Weight and Thickness Determination of Copper Foils With Etchable Carriers	1
2.2.18	Determination of Thickness of Laminates by Mechanical Measurement	1 & 2
2.2.18.1	Determination of Thickness of Metallic Clad Laminates, Cross-sectional	2
2.2.19.1	Length, Width and Perpendicularity of Laminate and Prepreg Panels	1 & 2
2.3.2	Chemical Resistance Of Flexible Printed Wiring Material	1 & 2
2.3.4	Chemical Resistance, Marking Paints and Inks	1 & 2
2.3.4.2	Chemical Resistance of Laminates, Prepreg and Coated Foil Products, by Solvent Exposure	1 & 2
2.3.5	Density, Insulating Material	1
2.3.6	Etching, Ammonium Persulfate Method	1
2.3.7	Etching, Ferric Chloride Method	1
2.3.7.1	Cupric Chloride Etching Method	1
2.3.7.2	Alkaline Etching Method	1
2.3.8	Flammability, Flexible Insulating Materials	2
2.3.8.1	Flammability of Flexible Printed Wiring	2
2.3.9	Flammability of Prepreg and Thin Laminate	2
2.3.10	Flammability of Laminate	2
2.3.10.1	Flammability of Soldermask on Printed Wiring Laminate	2
2.3.16	Resin Content of Prepreg, by Burn-off	2
2.3.16.1	Resin Content of Prepeg, by Treated Weight	1
2.3.16.2	Treated Weight of Prepreg	1
2.3.17	Resin Flow Percent of Prepreg	1
2.3.17.1	Resin Flow of Adhesive Coated Films and Unsupported Adhesive Films	1
2.3.17.2	Resin Flow of "No Flow" Prepreg	1
2.3.18	Gel Time, Prepreg Materials	1
2.3.19	Volatile Content of Prepreg	1
2.3.23	Cure (Permanency) Thermally Cured Solder Mask	1
2.3.24.2	Porosity of Metallic Coatings on Copper-Based Alloys and Nickel (Nitric Acid Vapor Test)	1 & 2
2.3.25	Detection and Measurement of Ionizable Surface Contaminants by Resistivity of Solvent Extract	1 & 2
2.3.29	Flammability, Flexible Flat Cable	2
2.3.37	Volatile Content of Adhesive Coated Dielectric Films	1
2.3.38	Surface Organic Contaminant Detection Test	1
2.3.40	Thermal Stability	1
2.4.1	Adhesion, Tape Testing	1 & 2
2.4.1.6	Adhesion, Polymer Coating	1 & 2
2.4.2.1	Flexural Fatigue and Ductility, Foil	1 & 2
2.4.3.1	Flexural Fatigue and Ductility, Flexible Printed Wiring	1 & 2
2.4.3.2	Flexural Fatigue and Ductility, Flexible Metal-Clad Dielectrics	1 & 2

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IPC-TM-650 Test Methods (cont.):

2.4.4	Flexural Strength of Laminates (at Ambient Temperature)	1 & 2
2.4.4.1	Flexural Strength of Laminates (at Elevated Temperature)	1 & 2
2.4.5.1	Flexibility – Conformal Coating	1 & 2
2.4.7	Machinability, Printed Wiring Materials	1 & 2
2.4.8	Peel Strength of Metallic Clad Laminates	1 & 2
2.4.8.1	Peel Strength, Metal Foil (Keyhole Method for Thin Laminates)	1 & 2
2.4.8.2	Peel Strength of Metallic Clad Laminates at Elevated Temperature (Hot Fluid Method)	1 & 2
2.4.8.3	Peel Strength of Metallic Clad Laminates at Elevated Temperature (Hot Air Method)	1 & 2
2.4.9	Peel Strength, Flexible Dielectric Materials	1 & 2
2.4.13	Solder Float Resistance Flexible Printed Wiring Materials	2
2.4.13.1	Thermal Stress of Laminates	2
2.4.18.1	Tensile Strength and Elongation, In-House Plating	1 & 2
2.4.19	Tensile Strength and Elongation, Flexible Printed Wiring Materials	1 & 2
2.4.21	Land Bond Strength, Unsupported Component Hole	1
2.4.22	Bow and Twist (Percentage)	1 & 2
2.4.24	Glass Transition Temperature and Z-Axis Thermal Expansion by TMA	1
2.4.24.1	Time to Delamination (TMA Method)	1
2.4.24.4	Glass Transition and Modulus of Materials Used in High Density Interconnection (HDI) and Microvias (DMA Method)	1
2.4.24.5	Glass Transition Temperature and Thermal Expansion of Materials Used In High Density Interconnection (HDI) and Microvias -TMA Method	1
2.4.25	Glass Transition Temperature and Cure Factor by DSC	1
2.4.27.2	Solder Mask Abrasion (Pencil Method)	1
2.4.28	Adhesion, Solder Mask (Non-Melting Metals)	1 & 2
2.4.28.1	Adhesion, Solder Resist (Mask), Tape Test Method	1 & 2
2.4.36	Rework Simulation, Plated-Through Holes for Leaded Components	1 & 2
2.4.38	Prepeg Scaled Flow Testing	1 & 2
2.4.39	Dimensional Stability, Glass Reinforced Thin Laminates	1
2.4.41.2	Coefficient of Thermal Expansion – Strain Gage Method	1 & 2
2.4.41.3	In-Plane Coefficient of Thermal Expansion, Organic Films	1
2.5.1	Arc Resistance of Printed Wiring Materials	1
2.5.5.1	Permittivity (Dielectric Constant) and Loss Tangent (Dissipation Factor) of Insulating Material at 1 MHz (Contacting Electrode Systems)	1
2.5.5.2	Dielectric Constant and Dissipation Factor of Printed Wiring Board Material—Clip Method	1
2.5.5.4	Dielectric Constant and Dissipation Factor of Printed Wiring Board Material—Micrometer Method	1
2.5.5.5	Stripline Test for Permittivity and Loss Tangent (Dielectric Constant and Dissipation Factor) at X-Band	1
2.5.6	Dielectric Breakdown of Rigid Printed Wiring Material	1
2.5.6.2	Electric Strength of Printed Wiring Material	1
2.5.6.3	Dielectric Breakdown Voltage and Dielectric Strength	1

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IPC-TM-650 Test Methods (cont.):

2.5.7	Dielectric Withstanding Voltage, PWB	1
2.5.7.1	Dielectric Withstanding Voltage – Polymeric Conformal Coating	1
2.5.8	Dissipation Factor of Flexible Printed Wiring Material	1
2.5.11	Insulation Resistance, Multilayer Printed Wiring (Within a Layer)	1
2.5.12	Interconnection Resistance, Multilayer Printed Wiring	1
2.5.17	Volume Resistivity and Surface Resistance of Printed Wiring Materials	1
2.5.17.1	Volume and Surface Resistivity of Dielectric Materials	1
2.5.17.2	Volume Resistivity of Conductive Resistance Used in High Density Interconnection (HDI) and Microvias, Two-Wire Method	1
2.5.27	Surface Insulation Resistance of Raw Printed Wiring Board Material	1
2.5.28	Q Resonance, Flexible Printed Wiring Materials	1
2.5.32	Resistance Test, Plated Through-Holes	1
2.6.2	Moisture Absorption, Flexible Printed Wiring	1
2.6.2.1	Water Absorption, Metal Clad Plastic Laminates	1
2.6.3	Moisture and Insulation Resistance, Printed Boards	1
2.6.3.1	Moisture and Insulation Resistance – Solder Mask	1
2.6.3.2	Moisture and Insulation Resistance, Flexible Base Dielectric	1
2.6.3.4	Moisture and Insulation Resistance – Conformal Coating	1
2.6.3.5	Bare Board Cleanliness by Surface Insulation Resistance	1
2.6.3.6	Surface Insulation Resistance – Fluxes – Telecommunications	1
2.6.5	Physical Shock, Multilayer Printed Wiring	1
2.6.6	Temperature Cycling, Printed Wiring Board	1
2.6.7	Thermal Shock and Continuity, Printed Board	1
2.6.7.1	Thermal Shock – Conformal Coating	1
2.6.7.2	Thermal Shock, Continuity and Microsection, Printed Board	1
2.6.7.3	Thermal Shock – Solder Mask	1
2.6.8	Thermal Stress, Plated Through-Holes	2
2.6.8.1	Thermal Stress, Laminate	2
2.6.9	Vibration, Rigid Printed Wiring	1
2.6.11	Hydrolytic Stability Solder Mask	1
2.6.11.1	Hydrolytic Stability – Conformal Coating	1
2.6.14	Resistance to Electrochemical Migration, Solder Mask	1
2.6.14.1	Electrochemical Migration Resistance Test	1
2.6.25	Conductive Anodic Filament (CAF) Resistance Test: X-Y Axis	1

SAE (Society of Automotive Engineers)

SAE J2253	Test Procedures for Automotive Structural Composite Materials (Formerly ACCM-T-02)	1 & 2
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*The laboratory is only accredited for the test methods listed above. The accredited test methods are used in determining compliance with the material specifications listed below. The inclusion of these material specifications on this Scope does not confer laboratory accreditation to the material specifications nor does it confer accreditation for the method(s) embedded within the specifications.*

<u>Test Method:</u>	<u>Test Title:</u>	<u>Building No.:</u>
MIL-I-46058	General Specification for Insulating Compound, Electrical (For Coating Printed Circuit Assemblies) (Except Fungus)	1 & 2
MIL-P-55110	General Specification for Printed Wiring Board, Rigid	1 & 2
MIL-S-13949	General Specification for Sheet, Printed Wiring Board (Except Fungus)	1 & 2
MIL-PRF-31032	General Specification for Printed Circuit Board/Printed Wiring Board	1 & 2
MIL-PRF-50884	General Specification for Printed-Wiring, Flexible and Rigid-Flex	1 & 2

on the following materials and products:

Adhesives, composites and laminates, printed boards and electrical insulating materials, elastomers, plastics and engineering thermoplastics, graphite or boron reinforced thermoplastics, metal matrix composites, graphite/epoxy, graphite/bismaleimide, polyimide/glass, epoxy/glass, toughened epoxy systems and graphite aramid or boron reinforced epoxies, and similar materials.

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.



The American Association for Laboratory Accreditation

World Class Accreditation

# Accredited Laboratory

A2LA has accredited

## DELSEN TESTING LABORATORIES, INC.

*Glendale, CA*

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 23<sup>rd</sup> day of November 2010.



  
\_\_\_\_\_  
Peter Abney

President & CEO  
For the Accreditation Council  
Certificate Number 0096.01  
Valid to July 31, 2012

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