SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELEMENT MATERIALS TECHNOLOGY DETROIT - WARREN 11 MILE
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MECHANICAL

Valid To: December 31, 2022 Certificate Number: 0098.11

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory at the location above ***as well as the two satellite laboratory locations listed below*** to perform the following tests:

Mechanical Tests: Tensile/Elongation; Hardness (Durometer and Rockwell); Compression; Impact (Izod, Charpy, and GM9300P); Strength at Room and High Temperatures; Shear Strength; Physical Properties Following Fluid Exposure; Hoses and Tubing; Tear Strength Using Tongue, and Trapezoid Methods; Filler, Glass, Carbon Black Content; Volume Change; Specific Gravity and Density; Cleanability; Dimensional Stability; Water Absorption; Melt Flow/Index; Migration and Contact Staining; Flammability; Compression Set; Low-Temperature Brittleness; Deflection Temperature; On Plastics, Rubber, Elastomer, Composite, Paper/Paperboard, Construction Elements, and Textile Products.

Environmental Simulation Tests: Weatherometer (Xenon); Sunlamp and QUV Exposure; Fadometer; Ozone Resistance; Fogging; Salt Spray; CASS; Humidity; Condensing; Crocking; Water Immersion; Taber Abrasion; Gravelometer; Specular Gloss; Luminous Transmittance; Chromaticity; Color Reading; Corrodokote; Oil/Gas Immersion Solvent and Detergent Resistance; Thermal Shock; Paint Adhesion; Spot Test Acid/Water and Soap; Cleanability; Coating Thickness; Flexibility; Perspiration; Scrub Resistance; Dime Scrape; Cure Test; Thumbnail Hardness; Oven Aging; Scab Corrosion; Environmental Cycling; Accelerated Corrosion; Filiform Corrosion.

Environmental Chambers Testing: Temperature, Dust and Humidity Exposures are Performed during Durability Cycling Simulating Actual Environment; Microprocessors Control Chambers allowing Automatic Cycling and Tracking of Desired Time, Temperature and Humidity; Sizes up to 4m x 10m x 5m; Flow Measurement (Liquid and/or Gas): Hydraulic Pump Performance; Fan and Blower Delivery Capabilities, Radiator Heat Exchange Capacity, Heater Output; Stress Measurements; Pressure Testing; Durability Testing Mechanical/Electrical Cycling; Marine Products (Pumps/Motors/Electronics); Hydrostatic Leak Testing (up to 40,000 psi); Electrodynamic Vibration Systems: Generate Controlled Sine or Random Vibration, Sine-on Random Vibration Control, Transient Vibration Control, Mechanical Shock in Sawtooth, Half-sine and Squared Wave Forms, Field Data Replication, Operating or Non-Operating Mode Environments, High or Low Temperature and Humidity Conditions Can be Applied; Servohydraulic Test Systems: Control of Displacement, Force or Acceleration; Thermal Shock, Liquid and Air; Light Intensity; Sound; MAST, Pressure Cycling; Pressure-Vacuum Cycling; Temperature Cycling; Component Performance Testing; Performance Testing including Electrical Evaluation; Hydrostatic Burst Testing

Using the following capabilities:

Test Technology	Range	Reference Standard
Combined Environments:	(-77 to 177) °C; (20 to 95) % RH	MIL-STD-810 (Method 514 Procedure I)
Dimensional	(0.00015 to 36.000) in	WSS-M15P4
Force	(0.01 to 22,000) lbf	GMW3172
Humidity	(5 to 98) % RH	MIL-STD-810
Liquid Flow	0.01 cc/min to 35 gpm	GM10004C
MAST: Multi Axial Simulation Table[2]	(1 to 50) Hz 6 Degrees of Freedom +/- Three Axis in all Axis Linear Displacement 2.95 (+/-) Angular Displacement roll 6.8° Pitch and Yaw 8.5° Linear Acceleration at max payload Vertical: 5 g's, Lateral 3 g's, Longitudinal: 2.4 g's Max Payload 1000 lbs 4'x 6' to 6'x 8' Table Size	MAST USC.13324.200X 433132 (Per Customer Specification)
Pressure	(0.008 to 45,000) psi	ESDS7H-19B591-AA
Pulse Pressure	Up to 1000 PSIG, Up to 20 Hz	GMW14139
Servohydraulic Frequencies	Up to 50 Hz	MIL-STD-810 (Method 514 Procedure I)
Servohydraulic Load Capacity	Up to 150,000 lbf	MIL-STD-810 (Method 514 Procedure I)
Servohydraulic Stroke	Up to 50 inches	MIL-STD-810 (Method 514 Procedure I)
Temperature	(-100 to 650) °C	WSS-M2D496-A1
Torque	1 in·oz to 80,000 in·lbf	GMW15607
Vacuum	(0.008 to 29.98) in Hg	DVM-0001-AS
Vibration:		
Displacement	2 in Peak to Peak	MIL-STD-810 (Method 514 Procedure I)
Load/Impact Velocity	1/2 SINE up to 1 ms to 35 m/s at Terminal Peak	MIL-STD-810 (Method 514 Procedure I)
Mechanical Shock Capacity	Up to 3,500 g	MIL-STD-810 (Method 514 Procedure I)
Vibration Acceleration	Up to 100 g	MIL-STD-810 (Method 514 Procedure I)
Vibration Frequencies	(3 to 2,700) Hz	MIL-STD-810 (Method 514 Procedure I)
Vibration Load Capacity	Up to 22,000 lbf	MIL-STD-810 (Method 514 Procedure I)

Also using customer specific test methods utilizing any combination of test equipment parameters listed above and the following tests and standards:

Test Method	Test Technology
ASTM D870	Testing Water Resistance of Coatings Using Water Immersion
GMW15201	Double-Coated Foam Tape for Exterior Attachments
GMW14325	HVAC Air Ducts
Abrasion	
ASTM D4157	Abrasion Resistance of Textiles, Wyzenbeek
GMW15487	Resistance to Abrasion of Organic Coating
NES M0136 Method 1	Abrasion Resistance
SAE J948	Resistance to Abrasion
Martindale Abrasion	
ASTM D4966	Abrasion Resistance of Textile Fabrics
ASTM D4970	Pilling Resistance and Other Related Surface Changes of Textile Fabrics: Martindale Tester
GMW3405	Seam Fatigue for Automobile Textiles
ISO 12945-2	Determination of Fabric Propensity to Surface Fuzzing and to Pilling, Modified Martindale Method
ISO 12947-1	Abrasion Resistance of Fabrics by the Martindale Method
ISO 12947-2	Abrasion Resistance of Fabrics by the Martindale Method – Specimen Breakdown
ISO 12947-3	Abrasion Resistance of Fabrics by the Martindale Method – Mass Loss
ISO 12947-4	Abrasion Resistance of Fabrics by the Martindale Method – Assessment of Appearance Change
Taber Abrasion	
ASTM C501	Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser
ASTM D3389	Coated Fabrics Abrasion Resistance (Rotary Platform, Double-Head Abrader)
ASTM D3884	Abrasion Resistance of Textiles, Taber
ASTM D4060	Taber Abrasion, Organic Coatings
FLTM BN 108-02	Abrasion-Taber
FLTM BN 108-04	Scuffing
SAE J1530	Resistance to Abrasion, Bearding, and Fiber Loss of Carpet, Taber
SAE J1847	Taber Abrasion
SAE J365	Scuffing Resistance, Taber
Adhesion	
ASTM B571 (Sections 3.8 and 13)	Qualitative Adhesion Testing of Metallic Coatings
ASTM D3359	Adhesion Tape Test
ASTM D952	Bond of Cohesive Strength of Sheet Plastics and Electrical Insulation
GMW14829	Tape Adhesion Test for Paint Finishes
GMW14892 (Section 3.1.5)	Adhesion

Test Method	Test Technology
Charpy	
ISO 179-1	Determination of Charpy Impact Properties, Non-Instrumented Impact Test
Chemical Resistance	
AATCC TM 104	Spot Test Water
AATCC TM 15	Perspiration
AATCC TM 6	Spot Test Acid
ASTM D1308	Effect of Household Chemicals on Clear and Pigmented Organic Finishes
ASTM D4752	Measuring MEK Resistance of Ethyl Silicate (Inorganic) Zinc-Rich Primers by Solvent Rub
ASTM D1693	Environmental Stress Cracking
ASTM D471	Rubber Property-Effect of Liquids
ASTM D543	Resistance of Plastics to Chemical Reagents
ASTM D925 Method A	Staining of Surfaces (Contact/Migration/Diffusion)
ASTM F146	Fluid Resistance of Gasket Materials
Chrysler LP-463PB-31-01	
Chrysler LP-463PB-57-03	
FLTM AN 101-01	Resistance of Textiles to Bleeding, Perspiration and Water Spotting
FLTM BI 113-01	Spot Test Water and Soap
FLTM BI 113-02	Spot Test Acid
FLTM BI 113-05	Resistance to Acid Spotting of Painted Test Panels or Actual Finished Parts
FLTM BI 113-07	Resistance to Synthetic Perspiration Staining
FLTM BI 152-01	Resistance of Paint Films to Solvents
FLTM BN 103-01	Resistance of Coated Fabrics and Plastic Film to Migration Staining And Blocking
FLTM BN 112-08	Soiling & Cleanability Test for Interior Trim Materials
GMW14102	Determination of Water Spotting Test
GMW14141	Dye Migration
GMW14333	Fuel Resistance of Automotive Exterior Materials and Components
GMW14334	Chemical Resistance to Fluids
GMW14444	Material Related Interior Part Performance
GMW14445	Sunscreen and Insect Repellent Resistance
GMW14864	Procedure for Determining the Staining of Trim Materials Due to Sulfur Dioxide, SO2, and Hydrogen Sulfide, H2S
GMW14701	Resistance of Coatings to Chemical Etching and Distortion
GMW16625	Preparation of Acid Rain Solution
GMW3402	Soil and Cleaner Resistance of Automotive Materials
NES M0133 Method 2 & 3	Chemical Resistance Test Methods
Nissan 28401NDS01 [10] Section CH/11	Resistance to Calcium Chloride

Test Method	Test Technology
Color	
ASTM D1003	Haze and Luminous Transmittance
ASTM D2244	Calculation of Color Differences from Instrumentally Measured Color Coordinates
SAE J1545	Delta-E Value (Color Measurement)
Compression	
ASTM D1056	Compression Force
ASTM D1229	Compression Set at Low Temperatures
ASTM D1621	Compressive Properties of Rigid Cellular Plastics
ASTM D395	Rubber Property-Compression Set (Method B)
ASTM D575	Rubber Properties in Compression
ASTM D695	Compressive Properties of Rigid Plastics
ASTM F36	Compressibility and Recovery of Gasket Materials
ISO 3386-2	Flexible Cellular Polymeric Materials – Determination of Stress-Strain Characteristics in Compression
ISO 815	Determination of Compression Set of Thermoplastic/Vulcanized Rubber at Ambient, Elevated, or Low Level Temperatures
Corrosion	
GMW15282	Corrosion/Undercutting Scribe Creepback
GMW15288	Scab Corrosion Creepback of Paint Systems for Metal Substrates
Salt Spray	
ASTM B117	Operating Salt Spray (Fog) Apparatus
ASTM B368	Copper-Accelerated Acetic Acid-Salt Spray (Fog) Testing (CASS Test)
ASTM G85	Corrosion Testing
DIN 50021 (Withdrawn 06/88)[1]	Salt Spray
FLTM BQ 105-01	Corrosion Testing, CASS
GM4298P (Inactive 12/10)[1]	Salt Spray Test
GM4476P (Inactive 12/10)[1]	CASS Test Copper-Accelerated Acetic Acid Salt Spray Test (Fog)
GMW3286	Neutral Salt Spray
GMW14458	CASS Test Copper Accelerated Acetic Acid Salt Spray Test
ISO 9227	Corrosion Testing, Salt Spray
RTCA DO-160 Section 14.0	Environmental Conditions/Test Procedures for Airborne Equipment: Salt Spray
Crocking	
AATCC TM 8	Crocking, Dry and Wet
FLTM BN 107-01	Crocking, Dry and Wet
SAE J861	Crocking
GMW14872	Cyclic Corrosion Chamber Humidity (20 to 100) %RH Chamber Temperature Ambient to 70°C Cycle Step Increments > 1 minute Atomized Solution Collection: Adjustable

Test Method	Test Technology
Crocking (cont'd)	
ASTM B380	Corrosion Testing of Decorative Electrodeposited Coatings by the Corrodkote Procedure
FLTM BI 123-01	Painted Sheet Metal Corrosion, Apg
SAE J2334	Cosmetic Corrosion
Density	
ASTM D1622	Apparent Density of Rigid Cellular Plastics
ASTM D3776	Mass Per Unit Area (Weight) of Fabric
ASTM D792	Density Method A
GMW3182	Determination of Mass per Area
ISO 1183-1	Determining the Density of Non-Cellular Plastics Using Immersion Method
ISO 845	Cellular Plastics and Rubbers – Determination in Apparent Density (Bulk)
Dimensional	
ASTM D1777	Thickness of Textile Materials
ASTM D5729	Standard Test Method for Thickness of Nonwoven Fabrics
ASTM D7091	Standard Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals
FLTM BI 117-01	Coating Thickness
ISO 2808, Mtd 7C	Paints and Varnishes – Determination of Film Thickness
ISO 5084	Determination of Thickness of Textiles and Textile Products
SAE J882	Thickness of Textile Materials
SAE J883	Dimensional Stability of Automotive Textiles
Dynamic Mechanical Properties	
ASTM D4065	Dynamic Mechanical Properties of Plastics
ASTM D4440	Rheological Measurements of Polymer Melts Using Dynamic Mechanical Procedures
ASTM D5279	Dynamic Mechanical Properties of Plastics Using Torsion
ISO 6721-1	Dynamic Mechanical Properties General Principles
ISO 6721-10	Dynamic Mechanical Properties Viscosity, Non-Resonance
ISO 6721-7	Dynamic Mechanical Properties Torsional, Non-Resonance
Environmental Exposure	
Ford MA-0130	Humidity Aging
IEC 60068-2-78	Test Cab: Damp Heat, Steady State
ISO 22088-3	Determination of Resistance to Environmental Stress Cracking (ESC)
MIL-STD-810C/D/E/F/G (Sections 500-503, 507, 512-514, 516, 520, 524, 528 only)	Environmental Test Methods and Engineering Guidelines
NES M0153	Moisture Resistance Test Method

Test Method	Test Technology
Environmental Exposure (cont'd)	
SAE J323	Cold Cracking of Flexible Plastic Materials
Fabric, Leather, and Other Textiles	
ASTM D1117	Evaluating Non-woven Fabrics
ASTM D751	Coated Fabrics (except Bursting Strength, Hydrostatic Pressure, Adhesion Coating, Strength of Coating, Crack Resistance, and Crush Resistance)
FLTM BN 106-02	Seam Fatigue Testing
GMW3211	Resistance to Stretch and Set
ISO 13937-2	Tear Properties of Fabrics
SAE J913	Wicking
SAE J855	Stretch and Set
Fatigue	
ASTM D6182	Flexibility and Adhesion of Finish on Leather
Chrysler LP-463KB-38-01	Fabric Lint Pickup and Lint Loss
FLTM BN 102-02	W Flex
Flexural	
ASTM D747	Apparent Bending Modulus of Plastics by Means of a Cantilever Beam
ASTM D790	Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM F147	Flexibility of Non-metallic Gasket Materials
ISO 178	Determination of Flexural Properties
SAE J949	Stiffness (Modulus of Bending)
Foams and Flexible Cellular Materials	
ASTM D1667	Flexible Cellular Materials-Vinyl Chloride Polymers and Copolymers
ASTM D3574	Test Methods for Flexible Cellular Materials (*except Test G, I4, Airflow, Test I2 Dynamic Fatigue Test by the Roller Shear at Constant Force, Test I4 Dynamic Fatigue Test for Carpet Cushion*)
ASTM D3575	Test Methods for Flexible Cellular Materials Made From Olefin (*except Sections 34-35, 45-46, 49-50, 66-67*)
Fogging	
GMW3235	Fogging
SAE J1756	Determination of Fogging Characteristics of Interior Automotive Materials
Toyota TSM0503G	Fogging Test Method for Non-Metallic Materials
Gloss	
ASTM D523	Specular Gloss
FLTM BI 110-01	Specular Gloss
JIS Z 8741	Specular Glossiness Methods of Measurement
Hardness	
ASTM D2240, Shore A and D	Durometer Hardness

Test Method	Test Technology
Hardness (cont'd)	
ASTM D3363	Film Hardness by Pencil Test
ASTM D785 R Scale	Rockwell Hardness of Plastics and Electrical Insulating Materials
ISO 868	Plastic and Ebonite – Determination of Indentation Hardness by Means of a Durometer (Shore Hardness)
Heat	
ASTM D2584	Ignition Loss of Cured Reinforced Resins
ASTM D3012	Thermal-Oxidative Stability of Propylene Plastics Using a Specimen Rotator Within an Oven
ASTM D3769	Heat Sag
Heat (cont'd)	
ASTM D518	Rubber Deterioration-Surface Cracking
ASTM D573	Rubber-Deterioration in an Air Oven
ISO 188	Rubber, Vulcanized Thermoplastic-Accelerated Aging and Heat Resistance Test
ISO 3451-1	Determination of Ash
SAE J912	Blocking Resistance
Hoses and Hard/Soft Lines	
ASTM D380	Method for Rubber Hose (*except Sections 12-13*)
GMW14319 Section 4.3.20 (pressure cycling) only	Air Conditioning Hose and Coupling Assemblies R134a and R1234yf
GMW14329 (Sections 4.3, 4.5, and 4.6)	Performance Testing of Heater and Coolant Hoses
GMW15724 (Section 4.3.8 (PDT) only)	Transmission and Engine Oil Cooler Plumbing System
PF 90080 (Sections 9.3.1 and 9.3.2 only)	Coolant Hoses and Plumbing Assemblies
Humidity	
ASTM D1735	Standard Practice for Testing Water Resistance of Coatings Using Water Fog Apparatus
SAE J1389	Corrosion Test for Insulation Materials
Impact	
ASTM D2137	Brittleness Point of Flexible Polymers and Coated Fabrics
ASTM D5420	Gardner Impact
ASTM D746	Brittleness Temperature of Plastics Elastomers by Impact
GMW16746	Evaluating Brittleness of Painted Plastics
SAE J400	Chip Resistance of Surface Coatings
Instrumented Impact	
ASTM D3763	Standard Test Method for High Speed Puncture Properties of Plastics Using Load and Displacement Sensors
Izod	
ASTM D1822	Tensile Impact
ASTM D256	Izod Pendulum Impact Resistance of Plastics
ASTM D4812	Unnotched Cantilever Beam Impact Strength of Plastics

Test Method	Test Technology
Izod (cont'd)	
ISO 180	Plastics – Determination of Izod Impact Strength
Melt Flow	
ASTM D1238	Melt Index (Flow Rate)
ISO 1133-1	Plastics – Determination of the Melt Mass-Flow Rate (MFR) and the Melt Volume-Flow Rate (MVR)
Odor	
FLTM BO 131-03	Interior Odor Test
GMW3205	Test Method for Determining the Resistance to Odor Propagation of Interior Materials
GMW3259	Determination of Resistance to Mildew Growth
SAE J1351	Hot Odor Test for Insulation Materials
Toyota TSM0505G	Smell Quality of Non-Metallic Materials
VDA 270	Determination of the Odor Characteristics
VW PV3900	Odor Test
Ozone	
ASTM D1149	Rubber Deterioration Surface Ozone Cracking in a Chamber
ASTM D1171	Rubber Deterioration Surface Ozone Cracking Outdoors or Chamber (Triangular)
VW PV3305	Test of Ozone Resistance and Permanent Deformation
28400NDS26	Exposure Only
Peel	
ASTM D1000	Unwind Pull (Method B only)
ASTM D3330	Peel Adhesion of Pressure Sensitive Tape
ASTM D413	Rubber Property-Adhesion to Flexible Substrate
ASTM D903	Peel or Stripping Strength of Adhesive Bonds
PSTC 101	Non-ASTM Peel
Permeability	
ASTM D737	Air Permeability of Fabrics, Fraiser Method
ASTM E96	Water Vapor Transmissions
Protection against Dust, Sand, Water, or Foreign Object Ingress	
DIN 40050-9 (Withdrawn 1993)[1]	Protection Against Foreign Objects; Water and Contact; Electrical Equipment (IP5KX, IP6KX, IPX1 through IPX4, IPX4K, IPX5, IPX6, IPX6K, IPX7, IPX8, IPX9K only)
IEC 60068-2-68 (*Except LA1 and LC1*)	Dust and Sand
IEC 60529	Degrees of protection provided by enclosures (IP code) (IP5X, IP6X, IPX1 through IPX9 only)
ISO 20653	Road Vehicles – Degrees of Protection (IP-Code) – Protection Against Foreign Objects, Water and Access – Electrical Equipment (IP5KX, IP6KX, IPX1 through IPX4, IPX4K, IPX5, IPX6, IPX6K, IPX7, IPX8, IPX9K only)
JIS D 0203 (R2, S1, S2)	Moisture, Rain and Spray Test for Automobile Parts
JIS D 0207	Dust Test for Automobile Parts (F-Type Only)

Test Method	Test Technology
Scratch	
FLTM BN 108-13	Scratch Test
GMW14130	Scuff and Mar Resistance
GMW14688	Resistance to Scratching
GMW14698 Method B	Scratch Resistance of Organic Coatings and Self-Adhesive Foils
Chrysler LP-463DD-18-01	Scratch and Mar Resistance of Automotive Plastics
Tear	
ASTM D1004	Initial Tear Resistance of Plastic Film and Sheeting
ASTM D2261	Tongue Tear
ASTM D5587	Tearing Strength of Fabrics by the Trapezoid Procedure
ASTM D5733	Tearing Strength of Nonwoven Fabrics by the Trapezoid Procedure
ASTM D624	Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer
GMW3326	Tearing Strength of Textile Materials by Trapezoid Method
GMW3387	Fiber Degradation of Automotive Textiles
ISO 34-1	Determination of Tear Strength of Thermoplastic/Vulcanized Rubber Using Trouser, Angle and Crescent Pieces
Tensile	
ASTM D1894	Static and Kinetic Coefficients of Friction of Plastic Film and Sheeting
ASTM D3163	Strength of Adhesive Bonded Rigid Lap Shear Joints
ASTM D412	Tensile Properties, Vulcanized Rubber and Thermoplastics Elastomers
ASTM D5034	Tensile Strength
ASTM D5035	Breaking Strength, Textile Fabrics, Strip Method
ASTM D638	Tensile Properties of Plastics (Including Poisson's Ratio)
ASTM D882	Tensile Properties Thin Plastic Sheeting
ASTM E132	Poisson's Ratio
ASTM F152	Tension Testing of Nonmetallic Gasket Materials
ISO 1798	Flexible Cellular Polymeric Materials- Determination of Tensile Strength and Elongation at Break
ISO 37	Determination of Tensile Stress/Strain Properties of Thermoplastic/Vulcanized Rubber
ISO 527-1	Tensile Properties Part 1 General Principles
ISO 527-2	Tensile Properties Part 2 Test Conditions for Molding and Extrusion Plastic
ISO 527-3	Tensile Properties Part 3 Film, Sheets
ISO 527-4	Tensile Properties Part 4 Isoropic and Orthotropic Fiber-Reinforced Plastics
ISO 527-5	Tensile Properties Part 5 Test Conditions for Unidirectional Fiber-Reinforced Plastics
ISO 8295	Coefficient of Friction
SAE J2044	Quick Connector Specification for Liquid Fuel and Vapor/Emissions Systems

Test Method	Test Technology
Thermal Cycle	
GMW14124	Automotive Environmental Cycles
VW PV1200	Resistance to Environmental Cycle Test (80 to -40) °C
Ford CETP 00.00.E-412	Sections 5.3.1-5.3.7
FCA CS.00056	Section 6.4.5.1-6.4.5.8
Vibration	
JIS D 1601	Vibration Testing Methods for Automobile Parts
Vicat	
ASTM D1525	Vicat Softening Temperature of Plastic
ASTM D648	Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position
ISO 306	Determination of Vicat Softening Temperature (VST) of Thermoplastic Materials
ISO 75-1	Plastics-Determination Temperature of Deflection Under Load Part 1 General Test Method
ISO 75-2	Plastics – Determination of Temperature of Deflection Under Load Part 2 Plastics and Ebonite
ISO 75-3	Plastics – Determination of Temperature of Deflection Under Load Part 3 High Strength Thermosetting

[3]This accreditation covers testing/calibration performed at the main laboratory listed above, and the following satellite laboratories listed below:

ELEMENT MATERIALS TECHNOLOGY
14610 Jib Street
Plymouth, MI 48170

Test Method	**Test Technology**
Ford IP-0105	Instrument Panel Sunload Resistance
Ford MA-0128	Simulated Sunload Resistance – Exterior
Ford MA-0130	Humidity Aging
Ford MA-0131	Heat Age
Ford OR-0329	Sunload Resistance – Exterior Ornamentation
GMW14124	Automotive Environmental Cycles
NES M0132	Thermal Cycle Test Methods for Plastic Parts
Nissan 96030 NDS00	Air Spoiler Testing
PF-11084	Door Trim Panel Assembly and Components
WSS-M15P32-C	Trim Assembly, Enclosed Luggage Compartment Covering
WSS-M15P45-A (*except 3.12*)	Performance, Instrument Panel Assembly, Flexible Cover Skin Material
WSS-M15P4-E	Interior Trim, Assembly Performance
WSS-M15P4-F	Assembly Performance, Hard Mold-In-Color Interior Components
WSS-M15P4-G (Sections 3.4.1, 3.4.2, 3.5.1.1)	Assembly Performance, Hard Mold-In-Color Interior Components

ELEMENT MATERIALS TECHNOLOGY
1920 Concept Dr.
Warren, MI 48091-1385

Test(s):	**Test Method(s):**
Abrasion Resistance	
Abrex	Ford FLTM BN 155-01; GS 97024-1, -4, -5
Adhesion Testing	ASTM B571 (*except sections 6 and 11*), ASTM D3359; Ford BI 106-01, BI 106-02; GMW3368, GMW14829
Chip or Gravel Resistance	ASTM D3170; Ford BI 157-04, BI 157-06; GMW14700; Chrysler LP 463PB-52-01; SAE J400
Color Measurements	
Instrumental, sphere	ASTM D2244, ASTM E1331; SAE J1545, J1717 (Appendix E)
Visual (Light Booth)	SAE J1545; ASTM D1729; Ford BI 109-01; AATCC (EP1); ISO 105-A03
Corrosion Testing	
Spray (CASS) Testing	ASTM B368
Cyclic Corrosion Testing	Ford BQ 105-01, BI 123-01, BI 123-03, CETP 00.00-L-467; GMW14458, GMW14872, GMW15288; NES M0158-96 CCTI & CCTIV; SAE J2334
Dynamic Sled (Crash Simulation, Front Impact, Side Impact, Rear Impact, Acceleration, Whiplash)	14 CFR 23; APTA PR-CS-S-011-99; FMVSS 202a, FMVSS 206 (Doors and Latching Mechanisms), FMVSS 207, FMVSS 208, FMVSS 214 (Side Impact), FMVSS 301 (Rear Impact); IIHS; EuroNCAP Whiplash; CNCAP Whiplash; JNCAP Whiplash; KNCAP Whiplash; IIHS RCAR-IIWPG Seat/Head Restraint Evaluation Protocol; NTEA-AMD Standardized Test Methods; UN ECE-17
Environmental Conditioning & Cycling	
Brittleness Temperature/ Cold Cracking	Chrysler LP-463LB-11-01-B, LP-463DD-07-01
Cold Cycling	Chrysler LP-463DD-08-02
Humidity	ASTM D1735, ASTM D2247; GMW14729
Hot/ Cold/ Humidity Cycling	GM9310P; Chrysler LP-463DD-08-02
Hot/ Cold/ Humidity / IR	GMW15432

Test(s):	**Test Method(s):**
Environmental Conditioning & Cycling (cont'd)	
Accelerated Ageing/Automotive Cycles	ASTM D5427; GMW14124
Environmental Cycles / Exposure / Thermal Shock	Chrysler LP-463CB-10-01, LP-463LB-12-01, LP-463PB-22-01, LP-463PB-52-01, LP-463LB-13-01, LP-463PB-36-01; BI 107-05, BQ 104-07; DVO-0001-IP; GM9310, GMW14124, GMW14872, GMW15432; MIL-STD 810G (Methods 501, 502, 503, 507, 521)
Evaluations	ASTM D610, D660, D661, D714, D1654; Ford BI 160-01 (*except procedure A*); GMW15282
Falling Sand Abrasion	ASTM D968
Filiform Corrosion	ASTM D2803; Ford BI 124-01
Film Thickness	ASTM D7091; Ford BI 117-01;
Flow Rates of Thermoplastics by Extrusion Plastomer	ASTM D1238; ISO 1133
Fluorescent UV Condensation Exposure	ASTM D4329, ASTM D4587, ASTM G151, ASTM G154; TSH3130G;SAE J2020
Fogging	GMW3235; HES D6508 SAE J1756; VW PV 3015 Chrysler LP-463DB-12-1; NES M0161; DIN 75201
Gloss/Haze Measurements	ASTM D523, ASTM D4039; Ford BI 110-01; SAE J1717 (Appendix E)
Hardness	
Pencil	ASTM D3363;
Humidity Resistance	
Water Fog Condensing Cleveland Condensing	ASTM D1735, ASTM D2247, ASTM D4585; Ford BI 104-02, BI 106-03, BQ 104-02; GMW14729
Impact	
Gardner	ASTM D2794, ASTM D5420 (Geometry GC and GE); Ford BI 108-01, BO 151-01 (Method B [Impact Ball Shore A 72.5])
Odor	NES M0160; TSM 0505G;

Test(s):	**Test Method(s):**
PACCAR Paint Performance	PACCAR CMT-0033 (*except section 8.1*)
Salt Spray (Fog) Testing	ASTM B117, ASTM G85; ISO 9227; Ford BI 103-01; GMW3286; NES M0140-01; JIS Z2371
Solvent Wipe	ASTM D5402; GMW15891
Standard Atmosphere for Conditioning & Testing	ASTM D618; ISO 291
Three-Dimensional (3D) Image Blue-Light Scanning	
Scan Volume 200 mm x 150 mm x 150 mm Scan Volume 500 mm x 380 mm x 380 mm	ATOS V8 SR1 Manual Basic; Customer-Specified
Water Resistance	
Water Immersion	ASTM D870
Water Chemistry	Ford BI 104-01, BI 104-04
Car Wash	GMW16745, GMW17103
Weathering (Artificial)	
Weatherometer	
ASTM D2565	Xenon-Arc Exposure of Plastics Intended for Outdoor Applications
ASTM D4459	Xenon-Arc Exposure of Plastics Intended for Indoor Applications
ASTM D7869	Xenon Arc Exposure Test with Enhanced Light and Water Exposure for Transportation Coatings
ASTM G155	Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials
Ford FLTM BO 116-01	Resistance to Interior Weathering
GMW14162	Colorfastness to Artificial Weathering
GMW3414	Colorfastness to Artificial Light
ISO 4892-2	Xenon Exposure Testing
SAE J1885 (Inactive 2008)[1]	Accelerated Exposure of Automotive Interior Trim Components Using a Controlled Irradiance Water Cool
SAE J1960 (Inactive 2008)[1]	Xenon Arc Accelerated Exposure (External)
SAE J2412	Accelerated Exposure of Automotive Interior Trim Components using a Controlled Irradiance Xenon-Arc
SAE J2527	Accelerated Exposure of Automotive Exterior Materials using a Controlled Irradiance Xenon-Arc

Xenon Weathering utilizing any combination of the following parameters[2]:

(0.2 to 1.38) W/m^2 at 340nm	Chamber Air Temperature (15 to 90) °C
(0.45 to 3.11) W/m^2 at 420 nm	Black Panel Temperature (25 to 125) °C
(26 to 166) W/m^2 at (300 to 400) nm	Chamber Humidity (10 to 95) %RH

Test(s):	Test Method(s):	Parameter(s):
Flexible Test Cells		
Durability Testing		
Mechanical Cycling	DVM 0019-ST; GMW3067, GMW7699, GMW7000, GMW9123 , GMW3172; Chrysler PF 8502, PF 8401, PF 11029; DC-10859, 10254; Customer Specifications[2]	Axial & Bending Fatigue: (50,000 lb max) Ultimate Strength: (200,000 lb max) Torsion: (up to 4000 ft./lbs – 100° Rotation) Pneumatic & Hydraulic actuation with force and/or position feedback
Slosh	PF.90083; PF.8950	Table travel length up to 1250 mm Table weight capacity 1300 lbs Table speed up to 300 mm / second Table acceleration up to 1.0 g Table cycle rate up to 3 Hz
Multi Axis Simulation Table (MAST) *(6 axis) up to 100 Hz*	ST-0009; DC-10859 (Heidedauerlauf); IP-0008 (Key Life Test); Customer Specifications[2]	6 DOF, vertical, lateral, longitudinal pitch, roll, and yaw inputs (-50 to 177) °C
Environmental Testing	GM9310P; Chrysler PF 11084, 11029; Ford SDS IT 0005, 9014; MES PA 5500 D; NES MO 131; Customer Specifications[2]	Temperature: (-100 to 374) ºF / (-73 to 190) ºC (using various reach-in, walk-in, and drive-in chambers) Humidity: Up to 95% RH
Solar Loading/ Heating Testing		
High & Low Temperature Testing with Relative Humidity		
Thermal Shock		
Noise Analysis Testing		
BSR Objective and Jury Evaluator	GMW7293, GMW14011; Customer Specifications[2]	Real Time 33 db ambient

Test(s):	Test Method(s):	Parameter(s):
Flexible Test Cells (cont'd)		
Vertical Pitch and Roll +4D Quiet Shaker System	GMW14011, GMW14144, GMW14155, GMW14188, GMW14240, GMW14264, GMW15655; Chrysler LP.7R027, LP.7R0774, PF 90192, PF 90052, PF 90223, PF 90232 (2015), PF 90243, PF 90283; Ford CETP 00.00-L-448, CETP 01.10-L-419_2, CETP 01.12-L-300, CETP 18.03-L-400, CETP 00.00-E-412, CETP 01.10-L-413, CETP 12.00-L-403, CES_Seat Recliner Component Eng., CES_Seat Track Component Eng., DVM-0010-SM, ES-6E5H-19980-AJ, Seat SDS v18 or newer	

The laboratory is accredited for the test methods listed above. The accredited test methods are used in determining compliance with the material specifications listed below; however, the inclusion of these material specifications on this Scope does not confer laboratory accreditation to the material specifications. Inclusion of these material specifications on this Scope also does not confer accreditation for every method embedded within the specification. Only the methods listed above on this Scope are accredited.

Test(s):	Test Method(s):
Chrysler:	
CS-11982	Electrical/Electronic (E/E) Environmental Specification
MS JP 1-3	Color Durability of Interior Materials
MS-DC 40	Co-Extruded Polyethylene Film
PF-10952	Floor Console Assembly System Requirements
PF-11084	Door Trim Panel Assembly and Components
PF-11203	Material Durability Requirements for Interior Plastic Trim Components
Ford:	
WSS-M1F27	Luxury Leather
WSS-M8P18	Fabric Performance
WSS-M15P32-C	Trim Assembly, Enclosed Luggage Compartment Covering
WSS-M15P45-A, except section 3.12	Performance, Instrument Panel Assembly, Flexible Cover Skin Material

Test(s):	Test Method(s):
Ford (cont'd):	
WSS-M15P4-E	Interior Trim, Assembly Performance
WSS-M15P4-F	Assembly Performance, Hard Mold-in-Color Interior Components
WSS-M15P4-G	Assembly Performance, Hard Mold-In-Color Interior Components
WSS-M1F28	Leather
FMVSS 571.106	Brake Hoses
GM:	
GMW14231	Automotive Fabrics
GMW14650	Performance Requirements for Exterior Plastic Parts
GMW16443	Peel Test Pressure Sensitive Adhesive
Japan:	
JIS L 1096	Woven Fabrics
Hyundai:	
MS 300-32	Woven, Knit
MS 320-05	Fabrics for Seats
Nissan:	
Nissan NES M0094	Flammability of Automotive Materials
SAE:	
SAE J1639	Test Methods for Nylon Materials
SAE J17	Latex Foam Rubbers
Toyota:	
Toyota TSH3130G	Paint Quality for Interior Parts
Volkswagen:	
VW PV3366	Elastomer Seals

[1] 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.

[2] Using the following standards and test methods:
ASTM, FMVSS, JIS, ISO, IP, SAE, GM, Ford, Chrysler, Mazda, Honda, Toyota, Navistar, Paccar, Volvo, Freightliner, and standards and specifications furnished by the customer for the parameters listed above and the equipment capabilities.

Accredited Laboratory

A2LA has accredited

ELEMENT MATERIALS TECHNOLOGY DETROIT – WARREN 11 MILE

Warren, MI

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 4th day of March 2021.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 0098.11
Valid to December 31, 2022

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