



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELEMENT MATERIALS TECHNOLOGY KITCHENER

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MECHANICAL

Valid To: March 31, 2027

Certificate Number: 214.50

In recognition of the successful completion of the A2LA evaluation process; accreditation is granted to this laboratory to perform the following types of tests on Adhesives (Organic Resins), Glues, Paints, Varnishes, Inks, Coatings, Plastics, Resins, Rubbers, and Articles of Metal:

| <u>Test Technology</u>   | <u>Test Capabilities</u>                                            | <u>Test Specifications/Standards</u> <sup>1,2,3:</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature and Humidity | (-80 to 190) °C<br>(10 to 98%) %RH                                  | ASTM D1735;<br>ESBT4P-7H420-AD [REV. A], Sect. A.28, A.29;<br>GMW3172, Sec. 8.4; GMW3259; GMW14124;<br>GMW14650, Sect. 4.2, 4.3; GMW14729;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                          | Fog Type and Condensing Humidity                                    | IEC 60068-2-1; IEC 60068-2-2; IEC 60068-2-3;<br>IEC 60068-2-13; IEC 60068-2-14; IEC 60068-2-18;<br>IEC 60068-2-28; IEC 60068-2-30; IEC 60068-2-38;<br>IEC 60068-2-56;<br>LP-463PB-22-01;<br>MIL-STD-202F, G, H, Methods 103, 106;<br>MIL-STD-810D, E, F, G, H, Methods 501, 502; 507;<br>MIL-STD-883G, H, J, K, L Methods 1004, 1008 & 1010;<br>NES M0007 [2014-N], Sect. 32 & 46;<br>NES M0132 [2022-N];<br>NES M0141 [2018-N], Sect. 6.2.11, 6.3.8 & 6.3.9;<br>NES M0153 [2022-N];<br>PF.90005 [2019], Sect. 5.2.1 & 5.5;<br>RTCA DO-160E, F, G, Sect. 5.0 & 6.0;<br>TS371-00-004 [2017], Sect. 14; 27 to 31;<br>TSM0502G [REV. 14] Sect. 4.1, 4.1.3, 4.1.4, 4.1.5, & 4.2;<br>TSM0501G [REV. 16], Sect. 9.19 |
| Thermal Shock            | Air to Air<br>(-65 to 180) °C<br>Liquid to Liquid<br>(-30 to 85) °C | MIL-STD-202F, G, H, Method 107;<br>MIL-STD-810D, E, F, G, H, Method 503;<br>MIL-STD-883G, H, J, K, L Method 1011;<br>PF.90005 [2019], Sect. 5.1.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Altitude                 | (-70 to 100)°C<br>(0 to 65, 000) feet                               | GMW3172, Sec 7.3;<br>MIL-STD-810D, E, F, G, H Method 500;<br>RTCA DO-160E, F G, Sect. 4.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| <b><u>Test Technology</u></b>                          | <b><u>Test Capabilities</u></b>                                                                                                                                                                  | <b><u>Test Specifications/Standards</u></b> <sup>1,2,3</sup> :                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Leak Testing                                           | Trace Gas Fine Leak<br>Perfluorocarbon Gross Leak                                                                                                                                                | MIL-STD-883G, H, J, K, L Method 1014.15,<br>Test Conditions A & C                                                                                                                                                                                                                                                                                                      |
| Salt Spray/ Salt Fog                                   | (25 to 70) °C                                                                                                                                                                                    | ASTM B117; FLTM BI 103-01; GMW3172; GMW3286;<br>HES D2021 [REV 3]; HES D6501 [REV 3] Sect. 3.15;<br>IEC 60068-2-11; IEC 60068-2-52;<br>ISO 9227;<br>MIL-STD-202F, G, H, Method 101;<br>MIL-STD-810D, E, F, G, H, Method 509;<br>NES M0140 [2014-N]; NES M0007 [2014-N], Sect. 33;<br>RTCA DO-160E, F, G, Sect. 14;<br>TSH1552G [REV. 7]; TS371-00-004 [2017], Sect. 11 |
| Cyclic Corrosion                                       | (25 to 70) °C<br>(25 to 100) %RH                                                                                                                                                                 | CETP 00.00-L-467;<br>FLTM BI 104-02; FLTM BI 123-01; FLTM BI 123-03;<br>GMW14872; GMW15282;<br>GMW15288;<br>SAE J2334; NES M0007 [2014-N], Sect. 33                                                                                                                                                                                                                    |
| Copper Accelerated<br>Acetic Acid Salt<br>Spray (CASS) | (25 to 70) °C                                                                                                                                                                                    | ASTM B368;<br>GMW14458; NES M0138 [2013-N]                                                                                                                                                                                                                                                                                                                             |
| Acidic Atmosphere                                      | (25 to 70) °C                                                                                                                                                                                    | MIL-STD-810D, E, F, G, H, Method 518                                                                                                                                                                                                                                                                                                                                   |
| Explosive<br>Atmosphere                                | (1000 to 55000) feet<br>(Ambient to 70) °C                                                                                                                                                       | MIL-STD-810E, F, G, H, Method 511;<br>RTCA DO 160E, F, G, Sect. 9.0                                                                                                                                                                                                                                                                                                    |
| Vibration                                              | Frequency:<br>(1 to 2000) Hz<br>Random: 13500 force lbs<br>Sine: 13500 force lbs<br>Max. Acceleration:<br>104 g Sine<br>With Temperature:<br>(-40 to 100) °C<br>With Humidity:<br>(10 to 95) %RH | ASTM D4728; GMW3172, Sect. 9.3;<br>IEC 60068-2-6;<br>MIL-STD-202F, G, H, Methods 201, 204, & 214;<br>MIL-STD-810D, E, F, G, H, Method 514;<br>MIL-STD-883G, H, J, K, L Methods 2001 & 2007;<br>RTCA DO 160E, F, G, Section 8.0;<br>TSM0502G [REV. 14], Sect. 4.4                                                                                                       |

| <b><u>Test Technology</u></b>       | <b><u>Test Capabilities</u></b>                                                                                                                                                                                                  | <b><u>Test Specifications/Standards</u> <sup>1,2,3</sup>:</b>                                                                                                                             |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shock                               | Pneumatic Shock Table<br>Duration:<br>(0.25 to 30) msec<br>Acceleration:<br>(5 to 10 000) g<br><br>Electrodynamic Shock<br>Tester<br>Duration: (up to 30) msec<br>Acceleration: (1 to 100) g<br><br>Half Sine<br>Sawtooth<br>SRS | IEC 60068-2-27;<br>MIL-STD-202F, G, H, Methods 203, 207, & 213;<br>MIL-STD-810D, E, F, G, H, Method 516;<br>MIL-STD-883G, H, J, K, L Method 2002;<br>RTCA DO 160E, F, G, Section 7.0      |
| Highly Accelerated Life Test (HALT) | Acceleration: 50 Grms<br>Temperature Range:<br>(-80 to 200) °C<br>Ramp Rate: 50 °C/min.                                                                                                                                          | Qualmark HALT Testing Guidelines, Document 933-0336 Rev:04                                                                                                                                |
| Linear and Constant Acceleration    | Acceleration:<br>(5 to 5 000) g                                                                                                                                                                                                  | MIL-STD-810E, F, G, H, Method 513;<br>MIL-STD-883G, H, J, K, L Method 2001, Test Condition A                                                                                              |
| Durability and Cycling              |                                                                                                                                                                                                                                  | ASTM D3574, Test I3;<br>ESBT4P-7H420-AD [REV. A], Sect. A.5, A.18;<br>PF.90015 [Change Level F], Sect. 6.3.14, 6.3.15;<br>RTS.3593, Sect. 6.1, 6.3, 6.5;<br>SAE J343, Sect. 4.2, 4.4, 4.6 |
| Sand and Dust                       | Temperature<br>(ambient to 70) °C<br>Blowing Sand and Dust<br>Free Settling Dust                                                                                                                                                 | IEC 60068-2-68, Test L;<br>MIL-STD-202F, G, H, Method 110;<br>MIL-STD-810D, E, F, G, H, Method 510;<br>PF.90084 [Change Level A];<br>RTCA DO-160E, F, G, Section 12;<br>SAE J726          |
| Dust (IP Codes)                     |                                                                                                                                                                                                                                  | IEC 60529 IP5X, IP6X; ISO 20653 IP5KX, IP6KX                                                                                                                                              |
| Water (IP Codes)                    |                                                                                                                                                                                                                                  | IEC 60529 IPX1, IPX2, IPX3, IPX4, IPX5, IPX6, IPX7, IPX8, IPX9; ISO 20653 IPX1, IPX2, IPX3, IPX4, IPX4K, IPX5, IPX6, IPX7, IPX8, IPX9K                                                    |
| Icing/Freezing Rain                 |                                                                                                                                                                                                                                  | GMW3172 Sect. 9.5.5;<br>MIL-STD-810E, F, G, H, Methods 521 & 524;<br>RTCA DO-160, Section 24                                                                                              |
| Waterproofness/Rain Exposure        | Speed: up to 18m/s                                                                                                                                                                                                               | MIL-STD-810E, F, G, H, Method 506;<br>RTCA DO-160E, F, G, Section 10                                                                                                                      |

| <b><u>Test Technology</u></b>                        | <b><u>Test Capabilities</u></b> | <b><u>Test Specifications/Standards</u></b> <sup>1,2,3</sup> :                                                                                                                                                                              |
|------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High Pressure<br>Cleaning / Water Jet                | Temperature:<br>(25 to 100) °C  | AA-0136 [REV. D];<br>ISO 16925;<br>FLTM BI 107-05;<br>GMW14797, GMW15919; GMW16745;<br>NES M0141 [2018-N], Sect. 6.2.13;<br>TS371-00-004 [2017], Sect. 36                                                                                   |
| Submergence/<br>Immersion                            |                                 | ASTM D570; ASTM D870;<br>FLTM BI 104-01; HES D6501 [REV. 3];<br>IEC 60068-2-18;<br>MIL-STD-202F, G, H, Method 104;<br>MIL-STD-810E, F, G, H, Method 512;<br>NES M0007 [2014-N], Sect. 57                                                    |
| Water Resistance /<br>Absorption                     |                                 | HES 0096Z-SM4-0000, Sect. 3 & 4;<br>AATCC 42; AATCC 127;<br>HES D6506D6506 [REV.5], NES M0141 [2018-N], Sect.<br>6.3.1 & 6.3.10;<br>TS371-00-004 [2017], Sect. 16 & 17;<br>TSM0501G [REV. 16], Sect. 9.16;<br>TSM0502G [REV. 14], Sect. 4.3 |
| Solar Climatic /<br>Solar Radiation /<br>IR Exposure | (-30 to 100) °C<br>(10- 90) %RH | DIN 75220;<br>MIL-STD-810E, F, G, H, Sect. 505;<br>TSM0502G [REV. 14], Sect. 4.1, Method B                                                                                                                                                  |
| Weatherability<br>and Solar (Xenon)                  | CI4000<br>CI5000<br>Q-Sun       | ASTM G155; ASTM D2565;<br>GMW14162; JIS D 0205; NES M0135 [2018-N];<br>SAE J1885; SAE J1960; SAE J2412; SAE J2527;<br>TSH1585G [REV. 6]; TSL0601G [REV. 11];<br>NES M0007 [2014-N], Sect. 48 (2);<br>NES M0141 [2018-N], Sect. 6.4.1 (7)    |
| Accelerated<br>Weathering                            | QUV                             | ASTM G154;<br>NES M0007 [2014-N], Sect. 48 (3);<br>NES M0141[2018-N], Sect. 6.4.1 (6);<br>SAE J2020                                                                                                                                         |
| Microscopic<br>Evaluation                            | Magnification:<br>20 to 1000 x  | ASTM A892; ASTM E112; ASTM E930;<br>MIL-STD-883, Method 2009                                                                                                                                                                                |
| Mass/Weight Testing                                  |                                 | D6506 [REV.5]; ISO J860                                                                                                                                                                                                                     |
| Differential Scanning<br>Colorimetry (DSC)           |                                 | ASTM D3895; ASTM D3418                                                                                                                                                                                                                      |
| Thermal Gravimetric<br>Analysis<br>(TGA)             |                                 | ASTM D3850; ASTM E1131                                                                                                                                                                                                                      |

| <b><u>Test Technology</u></b>                                             | <b><u>Test Capabilities</u></b>                                | <b><u>Test Specifications/Standards</u></b> <sup>1,2,3:</sup>                                                                                                                                                          |
|---------------------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fourier Transform Infrared (FTIR) Spectroscopy                            | Transmission<br>Reflectance<br>ATR<br>Microscope Capabilities  | ASTM E168                                                                                                                                                                                                              |
| Scanning Electron Microscope (SEM) / Energy Dispersive Spectroscopy (EDS) |                                                                | ASM Handbook Volume 12;<br>ASTM E1508                                                                                                                                                                                  |
| High Pressure Liquid Chromatography (HPLC)                                | Diode Detector<br>Aldehyde/ Formaldehyde Analysis              | GMW15635;<br>NES M0402 [2016-N]; PV3925 [2009-06];<br>TSM0508G [REV. 5]                                                                                                                                                |
| Gas Chromatography / Mass Spectroscopy (GC/MS)                            | Gerstel Thermal Desorption (TDS)<br>Headspace<br>Direct Inject | GMW15634;<br>NES M0402 [2016-N];<br>PV3341 [REV. 1];<br>TSM0508G [REV. 5]; TSM0512G [REV. 1];<br>VDA 278                                                                                                               |
| Moisture / VOC Content                                                    |                                                                | ASTM D2369; ASTM D1203; ASTM D2288;<br>LP-463DD-04-01;<br>NES M0007 [2014-N], Sect. 8;<br>NES M0141[2018-N], Sect. 5.5;<br>NES M7108 [2005-N], Sect. 17;<br>TSL5100G [REV.8]                                           |
| Adhesion Testing (Tape Adhesion)                                          |                                                                | ASTM B571; ASTM D3359; FLTM BI 106-01;<br>GMW14829; GMW15851;<br>ISO 2409;<br>NES M0007 [2014-N], Sect. 29;<br>NES M0141[2018-N], Sect. 6.2.4;<br>TS 371-00-004 [2017], Sect. 7 & 8;<br>TSM0501G [REV. 16], Sect. 9.22 |
| Coating Weight                                                            |                                                                | ASTM A90; ASTM B680                                                                                                                                                                                                    |
| Coating/ Film Thickness                                                   | Microscopic Measurements<br>Digital Thickness Gauge            | ASTM B487; ASTM B499;<br>FLTM BI 117-01; GMW14668;<br>ISO 2808, Sect. 5.4, 5.5;<br>TS371-00-004 [2017], Sect. 2, 3                                                                                                     |
| Paint Film Permeability                                                   |                                                                | NES M0141 [2018-N], Sect. 6.3.26                                                                                                                                                                                       |
| Stone/ Chip Resistance                                                    |                                                                | AA-0079 [REV. A];<br>ASTM D3170;<br>FLTM BI 157-05;<br>GMW14700, Methods B and C;<br>LP-463-PB-39-01;<br>NES M0007 [2014-N], Sect. 28 & 77                                                                             |

| <u>Test Technology</u>                                   | <u>Test Capabilities</u> | <u>Test Specifications/Standards</u> <sup>1,2,3:</sup>                                                                                                                                                                                         |
|----------------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stone/ Chip<br>Resistance (continued)                    |                          | NES M0141[2018-N], Sect. 6.2.3;<br>SAE J400, Methods B and C;<br>TS371-00-004 [2017], Sect. 10;<br>TSM0502G [REV. 14]G, Sect. 4.5.4;<br>FLTM BI 007-01; FLTM BI 157-06;<br>ISO 20567-1;<br>NES M0007 [2014-N], Sect. 28, Method B              |
| Density / Specific<br>Gravity                            |                          | ASTM D1056; ASTM D3574, Test A;<br>ASTM D3575, Suffix W; ASTM B328; ASTM D792;<br>GMW3182;<br>HES D6506 [REV.5];<br>ISO 1183-1;<br>NES M0007 [2014-N], Sect. 7;<br>NES M0141[2018-N], Sect. 5.4;<br>TSM0501G [REV. 16], Sect. 9.1              |
| Filler & Ash Content - (40 to 1050) °C<br>Muffle Furnace |                          | ASTM D2584; ASTM D5630;<br>ISO 1172;<br>NES M0007 [2014-N], Sect. 10;<br>TSM0501G [REV. 16], Sect. 9.24                                                                                                                                        |
| Melt Flow                                                |                          | ASTM D1238, Procedure A;<br>TSM0501G [REV. 16], Sect. 9.10                                                                                                                                                                                     |
| Coefficient of Friction                                  |                          | HES D6506 [REV.5], Section 5.23;<br>TSL5100G [REV.8], Sect. 4.36                                                                                                                                                                               |
| Tension/Compression                                      |                          | ASTM D1056; ASTM D3574, Test B, C, & D;<br>ASTM D3575, Suffix B, D, BB;<br>ASTM D1229; ASTM D395; ATSM D412; ASTM D575;<br>ASTM E8; ASTM F152; ASTM A370;<br>ISO 1856; ISO 844; ISO 7214, Sect. 8.8;<br>MIL-STD-883, Method 2019;<br>SAE J1352 |
| Tear Testing                                             |                          | ASTM D3574, Test F;<br>ASTM D1004; ASTM D2261;<br>ASTM D624; ASTM D5733;<br>HES D6506 [REV.5], Sect. 5.6;<br>ISO 7214, Sect. 8.7; ISO 8067;<br>NES M0076 [2023], Sect 13; NES M7108[2005-N], Sect. 8;<br>TSL5100G [REV.8], Sect. 4.4           |
| Tensile                                                  |                          | ASTM D3574, Test E; ASTM D952;<br>ASTM D1708; ASTM D1822; ASTM D2990;<br>ASTM D638; ASTM D882; ASTM A370;<br>ASTM D380; ASTM D5034;<br>HES D6506 [REV.5], Section 5.4;<br>ISO 37; ISO 527-1; ISO 527-2;<br>ISO 188; ISO 1798; ISO 1926         |

**Test Technology****Test Capabilities****Test Specifications/Standards**<sup>1,2,3</sup>:

Tensile (cont.)

NES M0076 [2023], Sect. 12; NES M7108[2005-N], Sect. 7;  
TSL3505G, Sect. 6.4; TSL2100G, Sect. 4.7;  
TSL3608G, Sect. 4.6, 4.8, 4.9;  
TSL5100G [REV.8], Sect. 4.3;  
TSM0501G [REV. 16], Sect. 9.2;  
TSM0506G, Sect. 3.2;  
TSL3607G, Sect. 6.1

Peel / Pluck /Shear  
Strength

ASTM D903;  
GMW14892;  
HES D6506 [REV.5], Sect. 5.24;  
LP-463LB-10-01;  
NES M0007 [2014-N], Sect. 7, 44, 67, & 69;  
NES M0076 [2023], Sect. 14;  
NES M0141 [2018-N], Sect. 6.3.27;  
NES M0152[2006-N], Sect. 12;  
NES M8506 [2024-N];  
SAE J1553; SAE J1679;  
TSL5100G [REV.8], Sect. 4.5;  
TSM0502G [REV. 14], Sect. 4.14 & 9.23

Flexural Bending /  
(3 Point) Modulus

ASTM D790;  
ISO 178; ISO 1209-1;  
NES M0141 [2018-N], Sect. 6.2.12;  
NES M7108[2005-N], Sect. 9;  
TSM0501G [REV. 16], Sect. 9.3

Mandrel Bend /  
Material Flexibility

ASTM D1056; ASTM B571; ASTM D926;  
FLTM BI 009-05,  
HES D6506 [REV.5] Sect. 5.8;  
LP-463LB-11-01, Methods A & B;  
NES M0007 [2014-N], Sect. 30;  
NES M0141 [2018-N], Sect. 6.2.7;  
SAE J323, Method A;  
TS371-00-004 [2017], Sect. 34;  
TSL5100G [REV.8], Sect. 4.18

Brittleness

ASTM D1790; ASTM D746;  
GMW16746;  
ISO 812; ISO 974;  
TSM0501G [REV. 16], Sect. 9.5

Gardner Impact

ASTM D2794; ASTM D5420;  
LP-463DB-14-01;  
NES M0007 [2014-N], Sect. 27;  
NES M0141 [2018-N], Sect. 6.2.2;  
TSL5100G [REV.8], Sect. 4.11

Impact

Temperature:  
(-40 to 180) °C

FMVSS 201;  
GMW14093;  
LP.7N022 [REV. A]

| <b><u>Test Technology</u></b> | <b><u>Test Capabilities</u></b>                                                                                                                 | <b><u>Test Specifications/Standards</u></b> <sup>1,2,3</sup> :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Impact (cont.)                | Temperature:<br>(-40 to 180) °C                                                                                                                 | NES M0007 [2014-N], Sect. 76; NES M0134 [2004-N];<br>SAE J323, Method B;<br>TS371-00-004 [2017], Sect. 9;<br>TSM0502G [REV. 14], Sect. 4.5.2                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Dimensional Stability         | FARO Arm (CMM):<br>up to 2 400 mm<br>(± 0.043 mm)<br>Calipers<br>Micrometers<br>Temperature:<br>(-70 to 180) °C<br>Humidity:<br>(10 to 100) %RH | ASTM D3575, Suffix S;<br>GMW3172;<br>HES D6506 [REV.5], Section 5.25 & 5.26;<br>ISO 2808, Sect. 5.2.4;<br>NES M0076 [2023], Sect 24, 25 & 26;<br>RTS.3593, Sect. 6.2;<br>SAE J343, Sect. 4.3;<br>TSL5100G [REV.8], Sect. 4.15;<br>TSM0501G [REV. 16], Sect. 9.13                                                                                                                                                                                                                                                                                                                                        |
| Abrasion                      | Taber Abraser<br>Crock Meter<br>Gakushin                                                                                                        | ASTM D1044; ASTM D4060; ASTM D3884;<br>HES D6506 [REV.5], Section 5.10;<br>LP-463KB-21-01;<br>NES M0141, Sect. 6.2.8, Method 4;<br>SAE J948; SAE J1530;<br>TSL5100G [REV.8], Sect. 4.12;<br>TSM0502G [REV. 14], Sect. 4.6.4;<br>FLTM BN 107-01; FLTM BN 108-10; FLTM BI 161-01;<br>LP-463PB-54-01;<br>SAE J861;<br>TSL5100G [REV.8], Sect. 4.8, 4.9, Method B;<br>HES D6506 [REV.5], Sect. 5.11.2;<br>JIS L 0849;<br>NES M0076 [2023], Sect 16 & 23;<br>NES M7108[2005-N], Sect. 15 & 16;<br>TSL5100G [REV.8], Sect. 4.8, Method A;<br>TSL5100G [REV.8], Sect. 4.33;<br>TSM0502G [REV. 14]G, Sect. 4.13 |
| Scratch Resistance            | Car Wash<br>Taber<br>Pencil Scratch<br>Five Finger<br>Scratch and Mar                                                                           | NES M0159, Method A & B;<br>NES M0152[2006-N], Sect. 13;<br>NES M7108 [2005-N], Sect. 10;<br>GMW14130;<br>ISO 20566;<br>LP-463DD-18-01;<br>GMW14688;<br>NES M0007 [2014-N], Sect. 31 & 55;<br>NES M0136 [2005-N], Method 1;<br>NES M0141 [2018-N], Sect. 6.2.8, Method 1, & 6.2.9,<br>Method 1 to 6;<br>TSL5100G [REV.8], Sect. 4.24, 4.25;<br>TSM0502G [REV. 14], Sect. 4.6.2;<br>TSL5100G [REV.8], Sect. 4.23;<br>TSM0502G [REV. 14], Sect. 4.15;<br>TS371-00-004 [2017], Sect. 5                                                                                                                     |
| Surface Roughness             |                                                                                                                                                 | ISO 4287, ISO 4288                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| <b><u>Test Technology</u></b> | <b><u>Test Capabilities</u></b>                                 | <b><u>Test Specifications/Standards</u></b> <sup>1,2,3</sup> :                                                                                                                                                   |
|-------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flammability                  | Horizontal and Vertical Orientation                             | CMVSS 302; FMVSS302;<br>ASTM D635;<br>GB 8410; GMW3232;<br>HES C206 [REV.9]; HES D6003 [REV.9];<br>ISO 3795; ISO J369;<br>LP-463KC-13-01;<br>NES M0094 [2015-2];<br>RTCA DO-160, Sect. 26;<br>TSM0500G [REV. 19] |
| Pencil Hardness               | 6B to 6H                                                        | 0096Z-SM4-0000 [2017], Sect. 10;<br>ASTM D3363;<br>HES D6501 [REV. 3];<br>GMW14130;<br>NES M0007 [2014-N], Sect. 26;<br>NES M0141 [2018-N], Sect. 6.2.1;<br>TSH1539G; TS371-00-004 [2017], Sect. 4               |
| Durometer Hardness            | Shore A<br>Shore D<br>Asker C                                   | ASTM D2240;<br>HES D2500, Sect. 3.7.2;<br>ISO 868;<br>TSM0501G [REV. 16], Sect. 9.9.2                                                                                                                            |
| Hardness - Rockwell           | HRA, HRBW, HRC, HRR                                             | ASTM D785; ASTM E18;<br>TSM0501G [REV. 16], Sect. 9.9.1                                                                                                                                                          |
| Appearance                    | AATCC Grayscale<br>Color scale<br>Macbeth Lightbooth            | ASTM D1729;<br>FLTM BI 109-01;<br>GMW15357;<br>JIS L 0804;<br>MIL-STD-883, Method 2009;<br>TS371-00-004 [2017], Sect. 1                                                                                          |
| Colour                        | CIE Color Scale<br>XYZ Color Scale<br><br>10° and 45° observers | ASTM D2244;<br>NES M0141 [2018-N], Sect. 6.1.5;<br>SAE J1545                                                                                                                                                     |
| Specular Gloss                | Tri-Gloss (20°, 60°, 85°)<br>60° Micro-Gloss                    | ASTM D4039; ASTM D2457; ASTM D523;<br>FLTM BI 110-01;<br>NES M0007 [2014-N], Sect. 21;<br>NES M0141 [2018-N], Sect. 6.1.2                                                                                        |
| Haze / Transmission           | Haze-Gard                                                       | ASTM D1003;<br>HES D6508 [REV.B];<br>NES M0161 [2011-N];<br>TSM0501G [REV. 16], Sect. 9.15                                                                                                                       |

| <b><u>Test Technology</u></b>                         | <b><u>Test Capabilities</u></b>                   | <b><u>Test Specifications/Standards</u></b> <sup>1,2,3</sup> :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fogging                                               | Haake Fog Units<br><br>Gravimetric<br>Photometric | DIN 75 201;<br>GMW3235; HES D6508 [REV.B];<br>LP-463DB-12-01; NES M0161 [2011-N];<br>PV3015 [2019-03]; SAE J1756;<br>TSM0503G [REV. 15]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Odor / Smell Testing                                  |                                                   | FLTM BO 131-01; FLTM BO 131-03;<br>GMW3205; HES D6506 [REV.5], Section 5.20;<br>LP-463KC-09-01; MS-300-34;<br>NES M0160 [2016-N]; PV3900 [2000-08], SAE J1351;<br>TSM0505G [REV. 13]; VDA 270                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Contamination by<br>Fluids / Fluids<br>Susceptibility |                                                   | MIL-STD-810D, E, F, G, H, Method 504;<br>RTCA DO-160E, F, G, Sect. 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Chemical / Fluid<br>Resistance                        | Solvents<br>Oil/Gasoline<br>Wax<br>Acid/Base      | 0096Z-SM4-0000 [2017], Sect. 7, 8, & 9;<br>ASTM D1308; ASTM D471; ASTM D1056;<br>FLTM BO 155-01;<br>GMW14333; GMW14334; GMW14650, Sect. 4.10;<br>GMW14701; GMW16955;<br>HES D6501 [REV. 3];<br>LP.7M052 [REV.A];<br>NES M0007 [2014-N], Sect. 36, 37, 39 to 41, 43, 59 to 64,<br>72, 73, & 74;<br>NES M0133 [2018-N];<br>NES M0141 [2018-N], Sect. 6.3.2 to 6.3.5, 6.3.7, 6.3.11 to<br>6.3.16, 6.3.18, 6.3.21, 6.3.23, 6.3.24, 6.3.25, & 6.3.28;<br>RTS.3593, Sect. 6.7;<br>SAE J343, Sect. 4.9;<br>TS371-00-004 [2017], Sect. 21 to 25, & 37;<br>TSH1551G; TSL5100G [REV.8], Sect. 4.35;<br>TSM0501G [REV. 16], Sect. 9.18;<br>TSM0502G [REV. 14] G, Sect. 4.8 |
| Contact Migration<br>Staining                         | Contact Migration                                 | HES D6506 [REV.5], Sect. 5.11;<br>NES M0007 [2014-N], Sect. 70;<br>NES M0076 [2023], Sect 22;<br>NES M0141 [2018-N], Sect. 6.2.5 & 6.3.17;<br>TS 371-00-004 [2017], Sect. 6;<br>TSH1501G [REV. 4];<br>TSL5100G [REV.8], Sect. 4.10, 4.37, & 4.38                                                                                                                                                                                                                                                                                                                                                                                                                |
| Gel Content<br>(Jelly Content)                        |                                                   | NES M0141 [2018-N], Sect. 6.3.20;<br>NES M0007 [2014-N], Sect. 65                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

<sup>1</sup> The laboratory is accredited for the test methods listed above. The accredited test methods listed above 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 specification. The 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.

**Chrysler:** PF.7051; PF.90189; PF.90192; PS.7232

**Ford:** WSS-M2P180-A; WSS-M2P181-A; WSS-M2P188-A1, B1, WSS-M99P2222; WSS-M15P50; WSS-M98P13; WSS-M2P177; WSS-M4P13-A; WSS-M15P4

**GM:** GMW14797; GMW14444; GMW14650; GMW15725

**Honda:** 0094Z-SFA-9000; 0094Z-SJC-A210-MI; 0096Z-SEC-A000; 0096Z-SIE-E000; 7214Z-ST7-0000-R4P21051-E; 7244Z-STKA-A000; 7315ZS5A-0000-R4Y21094-E; 7710Z-SCC-9000; 7710Z-SCC-9001; 7410Z-SDA-A000; 7481Z-SZAAA000-SZAAF2387-E; 7710Z-SCC-9001; 7710Z-SEP-A010-M1; 7710Z-SEP-A210-M1; 7710Z-SEP-A810-M1; 7710Z-SZAA-V000 DOC070529; 7710Z-TK4-A110-M1; 7710Z-TK4-A210-M1; 7710Z-TK4-A910-M1; 7710Z-WZXA-R800; 7711Z-SOK-A011-M1; 7785Z-STXA-A810-M1; 7785Z-STX-A810-M1-C4624034-E; 7850ZSNA-N901-R4523058-E; 8102Z-SDAX-A500; 8330Z-STX-A010-M1; 8341Z-S84-A000; 8350Z-SDA-9000; 8350Z-SNA-0000; 8350Z-SNA-N000; 8410Z-SJD-9000; 8420Z-SLJ-0000; 8460Z-SEA-0000; 8461Z-SZAA-V000

**Nissan:** 27800NDS00; 27860NDS00; 76840NDS00; 76850NDS00; 80900NDS00; 62022NDS00; 62256NDS01; NES M5081

**Rivian:** RTS.2006

**Tesla:** TM-5016; TM-0008F-M

**Toyota:** TSZ0001G; TSM5518G; TSM5523G; TSM5601G; TSM5608G; TSM5725G; TSM7500G; TSH3130G; TSH3131G; TSF0901G; TSF0902G; TSF0903G; TSF0904G; TSF0905G

*Note: Humidity values cannot exceed the absolute values of 0% & 100%*

<sup>2</sup> 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 test method, per Annex A, Part C of A2LA's *R101 - General Requirements: Accreditation of Conformity Assessment Bodies*.

<sup>3</sup> This laboratory's scope contains withdrawn or inactive 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

### ELEMENT MATERIALS TECHNOLOGY KITCHENER

*Kitchener, Ontario, Canada*

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 3<sup>rd</sup> day of June 2025.

A blue ink signature of Mr. Trace McInturff, written in a cursive style.

Mr. Trace McInturff, Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 0214.50  
Valid to March 31, 2027

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