SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

TUV SUD AMERICA- HOLLAND
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MECHANICAL

Valid To: June 30, 2022 Certificate Number: 2955.04

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following vibration, mechanical shock, thermal, exposure tests on automotive, military, aerospace, medical, and commercial outdoor lighting products:

Vibration: Sine and Random, 3 Axis Vibration, Frequency Range from (5 to 3,000) Hz, Force Pound Rating to 18,000 lbf, 2-inch displacement

Environmental Vibration: Temperature from (-73 to 177) °C and Humidity up to 97 %RH

Mechanical Shock: Up to 100 G's

Thermal Testing: Custom Profiles from (-73 to 210) °C

Temperature and Humidity: Temperature up to 90 °C; Relative Humidity up to 97 %RH

Thermal Shock: Custom Profiles from (-73 to 177) °C

Fluid Dynamics: Custom Liquid Temperature, Pressure and/or Flow Profiles ranging from (-40 to 145) °C, (0 to 10,000) PSI and (0 to 500) gpm, respectively. Custom Air Temperature, Pressure, and/or Flow Profiles ranging from (10 to 260) °C, (0 to 100) PSI and (0 to 2,000) kg/hr respectively

Cyclic Corrosion: Temperature: Ambient to 70 °C; Humidity: (50 to 100) %RH during High Humidity from Ambient to 60 °C

Dust: Injection 6 to 8 grams/min

Vacuum: Atmosphere to 20kPA (absolute)

Magnification: 5x to 1000x

X-Ray: up to 150kVA

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TEST TECHNOLOGY:	**TEST METHOD(s) [1, 2]:**
Vibration* (Including Environmental Vibration)	MIL-STD-810, Method 514; GM 9110P (1989); Chrysler PF-9688 (Proc. 2.6); SAE/USCAR-2; GMW 3172; GMW 3431; Ford ES-5L1T-14A067-AA; IEC 60601-1-11; IEC 60068-2-27
Mechanical Shock* (Including Environmental Shock)	MIL-STD-810, Method 516; GM 9110P (1989); GMW 3172; GMW 3431; IEC 60601-1-11; IEC 60068-2-64
Dust*	SAE J575; Ford ES-5L1T-14A067-AA; Toyota TSC7000G
Fluid Dynamics*	Volvo TR 1564798 (Issue 2); DMX DC11044; SAE J1542; GMW 14191; GMW 14193; Ford ESJL34-6K775-DA; Ford ESJX61-8D048-AA; Ford ESCH34-8005-AA; Ford ESHC24-8005-CD
Temperature Exposure / Thermal Shock*	MIL-STD-810, Methods 501, 502, and 503; GM 9505P (2005); GMW 3172; GMW 14124; GMW 14191; SAE/USCAR-2; Ford ES-5L1T-14A067-AA; Ford ES-F57H-19893-AA (Test III.H); Toyota TSC7000G (Section 4.6); Toyota TSC7010G (*except Section 3.4*); Toyota TSC7019G
Salt Fog*	ASTM B117; MIL-STD-810, Method 509; GM 4298 (1997); GM 9110P (1989); GM 9610 (1990); GMW 3172; Ford ES-5L1T-14A067-AA

TEST TECHNOLOGY:	**TEST METHOD(s) [1, 2]:**
Cyclic Corrosion*	GMW14872; SAE J2334; Ford CEPT:00.00-L-467
Temperature / Humidity*	GM 4465P (1985); MIL-STD-810, Method 507; GMW 3172; DIN 50017; Ford ES-5L1T-14A067-AA; Toyota TSC7000G; Toyota TSC7019G; IEC 60601-1-11
Environmental Life Cycle / Durability*	GM 9103 (1988); GM 9505P (2005); GM 9545P (1995); GM 6207M (2000); Chrysler PF-9007 (Appendix B, Proc. B-2.7); Fiat/Chrysler PF-90088; Ford ES-E59H-18B402-AA (Proc. IV.F.) Pressure, Temperature; SAE J2044; USCAR-2; GMW 6273 (*except Sections 3.4.1, 3.4.7, 3.4.8, and 3.4.9*); GMW 3431; GMW 16295
Tensile (Room Temperature) *	ASTM A370 E8
Pit Depth Analysis*	Ford ESG3G3-8005-AA; GMW14193
Solder Joint Inspection and Cross-Sectioning*	Toyota TSC7019G; Toyota TSC7038G; IPC-A-610
Radioscopy (Digital X-Ray)	ASTM E1255, E1416, E1734
Terminal Crimp Evaluation*	USCAR21

* Including customer supplied and industry specifications directly related to the test technologies and parameters listed above.

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

[2] The laboratory is only accredited for testing activities outlined within the test methods listed above. Reference to any other activity within these standards, such as risk management or risk assessment, does not fall within the laboratory's accredited capabilities.

Accredited Laboratory

A2LA has accredited

TUV SUD AMERICA - HOLLAND

Holland, 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 15th day of July 2020.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2955.04
Valid to June 30, 2022

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