



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

CARMEL-ENVIRONMENTAL TESTS LTD.
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MECHANICAL

Valid To: May 31, 2022

Certificate Number: 2881.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests on aircraft, military, and commercial products:

Environmental Simulation Tests:

<u>Test:</u>	<u>Test Methods ⁴:</u>
Altitude	ABD0100.1.2 (Airbus); ASTM D4169-09, D4169-14, D4169-16 – Schedule I; ASTM D6653/D6653M – 13; ASTM D7386-12, ASTM D7386-16; ATPD 2404B; DEF STAN 00-35, Part 3, Issue 4:2006; Chapter 3-09 Test CL9 - Rapid and Explosive Decompression; GR-63-CORE, Issue 1 Paragraph 4.1 and 5.1; GR-63-CORE, Issue 2, 3 Paragraph 4.1.3 and 5.1.3; IEC 60721-4-1:2001+A1:03 – Low air pressure; IEC 60721-4-2:2001+A1:03 – Low air pressure; IEC 60721-4-3:2001+A1:03 – Low air pressure; IEC 60721-4-4:2001+A1:03 – Low air pressure; IEC 60721-4-7:2001+A1:03 – Low air pressure; IEC 60601-1-11 – Editions 1, 2 (2015); IEC 60601-1-12; IEC 60721-3-2; JSS 55555:2000 Rev.2, JSS 55555:2012 Rev.3 Test Number 3; ISO 10236 Part 9; ISO 14708-1:2000(E), ISO 14708-1:2008; ISO 14708-1:2014; MIL-B-49430C (ER) Paragraph 4.8.7; MIL-B-49458C (ER) Paragraph 4.7.7; MIL-PRF-49471B (CR) Paragraph 4.7.7; MIL-PRF-28800F 3.8.3; MIL-STD-202F Method 105C, Conditions A, B, C, and F; MIL-STD-202G Method 105C, Conditions A, B, C, and F; MIL-STD-810C Method 500.1, Procedures I and II; MIL-STD-810D Method 500.2, Procedures I and II; MIL-STD-810E Method 500.3, Procedures I and II; MIL-STD-810F Method 500.4, Procedures I and II; MIL-STD-810G Method 500.5, Procedures I, II, and III;

Test:	Test Methods ⁴:
Altitude (cont.)	MIL-STD-810G (Change1) Method 500.6 Procedures I, II, and III; MIL-STD-810H Method 500.6 Procedures I, II, and III; SAE J1455; RTCA DO-160D, E, F, G Section 4, Paragraph 4.6.1, Category Ax, Bx, Cx, Dx, Ex, Fx; UN Transport of Dangerous Goods, Test T.1
Temperature / Altitude	DEF STAN 00-35, Part 3, Issue 4:2006: Chapter 3-11 Test CL11 - High Temperature - Low Pressure, Chapter 3-12 Test CL12 - Low Temperature - Low Pressure Test, Chapter 3-13 Test CL13 - Low Temperature - Low Pressure - High Humidity; MIL-STD-810C Method 504.1, Procedure I; MIL-STD-810D Method 520.0, Procedure I; MIL-STD-810E Method 520.1, Procedure I; MIL-STD-810F Method 520.2, Procedure I; MIL-STD-810G Method 520.3, Procedure I; MIL-STD-810G (Change 1) Method 520.4, Procedure I; MIL-STD-810H Method 520.5 Procedure I; RTCA DO-160D, E, G Section 4; IEC 60601-1-11 – Editions 1, 2 (2015); IEC 60601-1-12
Bench Handling	ATPD 2404B; MIL-STD-810C Method 516.2, Procedure V; MIL-STD-810D Method 516.3, Procedure VI; MIL-STD-810E Method 516.4, Procedure VI; MIL-STD-810F Method 516.5, Procedure VI; MIL-STD-810G Method 516.6, Procedure VI; MIL-STD-810G (Change 1) Method 516.7, Procedure VI; MIL-STD-810H Method 516.8, Procedure VI; MIL-PRF-28800F 3.8.5.3
Bounce (Loose Cargo Vibration)	ASTM D4169-09, D4169-14, D4169-16 – Schedule F; ASTM D999-96, D999-01, D999-07, D999-08 (2015); IEC 68-2-55, IEC 60068-2-55, Test Ee; ISTA 1A-2014, ISTA 2A-2011, ISTA 3A-2008, ISTA 1B-2011, ISTA 2B-2011; ISO 9022-3:2015; JSS 55555:2000 Rev.2, JSS 55555:2012 Rev.3 Test Number 4; MIL-STD-810C Method 514.2, Procedure IX Part 2, X, and XI; MIL-STD-810D Method 514.3, Category 3, Procedure II; MIL-STD-810E Method 514.4, Category 3, Procedure III; MIL-STD-810F Method 514.5, Category 5, Procedure II; MIL-STD-810G Method 514.6 ,Category 5, Procedure II; MIL-STD-810G (Change 1) Method 514.7, Category 5, Procedure II; MIL-STD-810H Method 514.8 Category 5, Procedure II; MIL-PRF-28800F 3.8.4.3; MIL-STD-331B

Test:	Test Methods ⁴:
Compression, Stacking	ASTM D4169-09, D4169-14, D4169-16 – Schedule C; ASTM D642-00, D642-15; ASTM D7386-12, ASTM D7386-16; ISTA 2A-2008, 2A-2011, ISTA 2B-2011; ISO 2234 (2000); IEC 60601-1 – Push Test
Drop & Topple	DEF STAN 00-35, Part 3, Issue 4:2006; ETSI EN 300 019-2-77:2003-04; IEC 68-2-31, IEC 60068-2-31, Test Ec; IEC 68-2-31, IEC 60068-2-31 amm-1982: Test Ec; IEC 60721-4-7:2001+A1:03 – Drop and Topple; IEC 60721-4-2:2001+A1:03 – Drop and Topple; ISTA 2A-2011; JSS 55555:2000 Rev. 2, JSS 55555:2012 Rev.3 Test Number 26; QM-333 Paragraph 13.0, Categories A, B, C, D; ISO 9022-3:2015
Drop Test	ASTM D5276, ASTM D5276-98 (2017), ASTM D5276-19, ASTM D7386-12; ASTM D6179-07 (2014); ASTM D4169-09, D4169-14, D4169-16 – Schedule A; ASTM D7386-12, ASTM D7386-16; ASTM D5487-16; EN 50130 Section 21 Free Fall (Operational); EN 50130:1999 Section 21 Free Fall (Operational); EN 1789:2007+A2; GR-63-CORE, Paragraph 5.3.1, Category A & B; GR-63-CORE, Paragraph 5.3.2; GS 95024-3-1:2019-08 (BMW); IEC 68-2-32, IEC 60068-2-32: Test Ed, Free Fall; IEC 60601-1-11 – Editions 1, 2 (2015); IEC 60721-3-2; IEC 61131-2 (Edition 3); IEC 60601-1:2005; MIL-B-49430C (ER), Paragraph 4.8.3; MIL-PRF-28800F 3.8.5.2; MIL-PRF-49471B (CR), Paragraph 3.10; MIL-STD-810C Method 516.2 Procedure II; MIL-STD-810D Method 516.3 Procedures III and IV; MIL-STD-810E Method 516.4 Procedures III and IV; MIL-STD-810F Method 516.5 Procedure IV; MIL-STD-810G Method 516.6 Procedure IV; MIL-STD-810G (Change 1) Method 516.7 Procedure IV; MIL-STD-810H Method 516.8 Procedure IV; MIL-STD-1344A Method 2015; MIL-STD-331B; ISO 10651-3 Lung Ventilators Medical Use Part 3 Section 4: Protection against mechanical hazards; BMW Group GS95003-1;



Test:	Test Methods ⁴:
Drop Test (cont.)	BS EN 50130-5:1999 Alarm Systems Part 5: Environmental Test Methods; DEF STAN 00-35, Part 3, Issue 4:2006; ISTA 1A-2014, ISTA 2A-2011, ISTA 3A-2008, ISTA 1B-2011, ISTA 2B-2011, ISTA 1G-2014, ISTA 1C; MIL-STD-648D; IS 10236 Part 15; ISO 14708-1:2000(E), ISO 14708-1:2008, ISO 14708-1:2014; ISO 9022-3:2015; ISO 4180-2:2009; ISO 11608-1-2015; ISO 16750-3; SAE J1455
Fire, Flammability	ABD0100.1.2 (Airbus); RTCA/DO-160E, F, G, Section 26; UL-94
Immersion	ABD0100.1.2 (Airbus); ATPD 2404B; DEF STAN 00-35, Part 3, Issue 4:2006; GS 95024-3-1:2019-08 (BMW); IEC 60529, Temporary Immersion IPx7, IPx8; IEC 60529-2001 COR 1 2003, Temporary Immersion IPx7 Paragraph 14.2.7; IEC 60529-2001 COR 1 2003, Continuous Immersion IPx8 Paragraph 14.2.8; ISO 20653 Degrees of protection (IP-Code); ISO 20653: 2006 Degrees of protection (IP-Code), IPx7, IPx8; JSS 55555:2000 Rev. 2, JSS 55555:2012 Rev.3 Test Number 19; MIL-DLT-62547C(AT); MIL-STD-810C Method 512.1, Procedure I and IV; MIL-STD-810D Method 512.2, Procedure I; MIL-STD-810E Method 512.3, Procedure I; MIL-STD-810F Method 512.4, Procedure I; MIL-STD-810G Method 512.6, Procedure I; MIL-STD-810G (Change 1) Method 512.6, Procedure I; MIL-STD-810H Method 512.6, Procedure I; SAE J1455
Mechanical Shock	ABD0100.1.2 (Airbus); ASTM D4169-09, D4169-14; ASTM D4169-16 Schedule J- Concentrated Impact (Test Method D6344); ASTM D6344-04 (2017); ASTM D880-92 (2015) (Side Impact); ISO 2244 (Horizontal impact by means of pendulum test); ATPD 2404B; BMW Group GS95003-1; BS EN 50130-5:1999 Alarm Systems Part 5: Environmental Test Methods; EN 1789:2007+A2;

Test:	Test Methods ⁴:
Mechanical Shock (cont.)	BS EN 61373:1999, 2010; BS EN 50155:2007; DEF STAN 00-35, Part 3, Issue 4:2006; ECSS-E-ST-10-03C (1 June 2012); ETSI 300-019-2-1, 2, 3, 4, 5, 6, 7, 8; GM 9123P; GS 95024-3-1:2019-08 (BMW); MIL-STD-648D; IEC 68-2-27, IEC 60068-2-27:Test Ea; IEC 68-2-29, IEC 60068-2-29:Test Eb; IEC 60601-1-11; IEC 60601-1-12; IEC 60721-4-1:2001+A1:03 – Shock; IEC 60721-4-2:2001+A1:03 – Shock; IEC 60721-4-3:2001+A1:03 – Shock; IEC 60721-4-4:2001+A1:03 – Shock; IEC 60721-4-7:2001+A1:03 – Shock; IEC 60721-3-2; IEC 61131-2 (Edition 3); IEC 60601-1 – Impact; IEC 60601-1-11; IEC 60068-2-75 – Hammer Tests; IEC 62262 (EN 62262, IK ratings) – Impact; IS 10236 Part 10 - Bump, IS 10236 Part 12 – Shock; ISO 10651-3 Lung Ventilators Medical Use Part 3 Section 4: Protection against mechanical hazards; ISO 80601-2-55:2011, Clause 201.15.3.5.101 ISO 80601-2-12:2011, Clause 201.15.3.5.101 ISO 9022-3:2015; ISO 15004-1:2007; ISO 14708-1:2008, ISO 14708-1:2014; ISO 16750-3; ISO 2233:2001; ISTA 1A-2014, ISTA 2A-2011, ISTA 3A-2008; JEDEC Standard JESD22-B104C; JSS 55555:2000 Rev. 2, JSS 55555:2012 Rev.3 Test Number 4, 24; MIL-B-49430, Paragraph 4.8.5; MIL-B-49458C (ER), Paragraph 4.7.5; MIL-DLT-62547C(AT); MIL-PRF-49471B (CR), Paragraph 3.9; MIL-STD-202F Method 213B, Conditions A, B, C, D, E, F, G,H, I, J, and K; MIL-STD-202G Method 213B, Conditions A, B, C, D, E, F, G,H, I, J, and K;

Test:	Test Methods ⁴:
Mechanical Shock (cont)	MIL-STD-810C Method 516.2, Procedures I, III, IV, and VI; MIL-STD-810D Method 516.3, Procedures I, II, V, and VIII; MIL-STD-810E Method 516.4, Procedures I, II, V, and VIII; MIL-STD-810F Method 516.5, Procedures I, II, III, V, and VIII; MIL-STD-810G Method 516.6, Procedures I, II, III, V, and VIII; MIL-STD-810G (Change 1) Method 516.7, Procedures I, II, III, V, and VIII; MIL-STD-810H Method 516.8, Procedures I, II, III, V, and VIII; MIL-STD-883A Method 2002.1, Condition A; MIL-STD-883E Method 2002.3, Condition A; MIL-STD-883F Method 2002.4, Condition A; MIL-STD-883G Method 2002.5, Condition A; MIL-STD-883H Method 2002.6, Condition A; MIL-STD-883J Method 2002.7, Condition A; MIL-STD-1344A Method 2004.1, Conditions A, B, C, E, F, G, H, and I; MIL-STD-1344A Method 2004.1, Conditions A, B, C, E, F, G, H, and I; RTCA DO-160D, 160E Section 7, Paragraphs 7.2.1, 7.2.2, Operational; RTCA DO-160D Section 7, Paragraphs 7.3.1, 7.3.1.1, Crash Safety; RTCA DO-160E, 160F, 160G Section 7, Paragraphs 7.3.1, 7.3.2, Crash Safety; UL-1642 4ED Rev August 2006, Paragraph 14A; UL 1254, Section 46; MIL-PRF-28800F 3.8.5; SAE J1455
Rain (Water Test)	ABD0100.1.2 (Airbus); ATPD 2404B; BS EN 50130-5:1999 Alarm Systems Part 5: Environmental Test Methods; DEF STAN 00-35, Part 3, Issue 4:2006 Chapter 3-27; DEF STAN 00-35, Part 3, Issue 4:2006 Chapter 3-28; GS 95024-3-1:2019-08 (BMW); IEC 68-2-18, IEC 60068-2-18 Test Rb2; IEC 60721-4-1:2001+A1:03 – Rain; IEC 60721-4-2:2001+A1:03 – Rain; IEC 60721-4-3:2001+A1:03 – Rain; IEC 60721-4-4:2001+A1:03 – Rain; IEC 60721-4-7:2001+A1:03 – Rain; IEC 60721-3-2; IEC 60529-2001 -02, Protection Against Water; IEC 60529 IPX1 Vertically Dripping; IEC 60529 IPX2 Dripping (15° tilted); IEC 60529 IPX3 Spraying; IEC 60529 IPX4 Splashing; IEC 60529 IPX5 Jetting; IEC 60529 IPX6 Powerful Jetting; IEC 60529 IPX7 Immersion; IEC 60529 IPX8 Immersion; IEC 60529 IPX9 Resist Ingress of High Temperature (Steam)/High Pressure Water;



Test:	Test Methods ⁴:
Rain (Water Test) (cont.)	IS 10236 Part 14 – Driving Rain; ISO 20653:2013; JSS 55555:2000 Rev.2, JSS 55555:2012 Rev.3 Test Number 11,12,16; MIL-DLT-62547C(AT); MIL-STD-810C Method 506.2, Procedures I and II; MIL-STD-810D Method 506.3, Procedures I and II; MIL-STD-810E Method 506.4, Procedures I and III; MIL-STD-810F Method 506.5, Procedures I and III; MIL-STD-810G Method 506.6, Procedures I and III; MIL-STD-810G (Change 1) Method 506.6, Procedures I and III; MIL-STD-810H Method 506.6, Procedures I and III; MIL-STD-108, Splashproof; MIL-STD-108E, Splashproof Paragraph 4.9; RTCA DO-160D,E,F,G Section 10; MIL-PRF-28800F 3.8.6; SAE J1455
Contamination by Fluids	ABD0100.1.2 (Airbus); ATPD 2404B; DEF STAN 00-35, Part 3, Issue 4:2006 Chapter 4-04 Test CN4; GS 95024-3-1:2019-08 (BMW); JSS 55555:200 Rev. 2 Test Number 6; MIL-STD 810F Method 504; MIL-STD 810G Method 504.1; MIL-STD-810G (Change 1) Method 504.2 MIL-STD-810H Method 504.3 RTCA/DO-160 C, D, E, F, Section 11; SAE J1455
Explosive Atmosphere	ABD0100.1.2 (Airbus); MIL-STD 810B:67 Method 511; MIL-STD 810C:75 Method 511; MIL-STD 810D:83 Method 511; MIL-STD 810E:89 Method 511; MIL-STD 810F:00 Method 511; MIL-STD 810G:08 Method 511; MIL-STD-810G (Change 1) Method 511.6; MIL-STD-810H Method 511.7; RTCA/ DO-160C Section 9; RTCA/DO-160D:97+CHG1:00+ CHG2:01+ CHG3:02 Section 9; RTCA/DO-160E:04 Section 9; RTCA/DO-160F:07 Section 9; RTCA/DO-160G:10 Section 9; MIL-PRF-28800F 3.8.9

Test:	Test Methods ⁴:
Icing	ABD0100.1.2 (Airbus); ATPD 2404B; DEF STAN 00-35, Part 3, Issue 4:2006 Chapter 3-10 Test CL10; JSS 55555:2000 Rev.2, JSS 55555:2012 Rev.3 Test Number 18; MIL-STD 810 D,E,F,G Method 521; MIL-STD-810G (Change 1) Method 521.4; MIL-STD-810H Method 521.4; RTCA/DO-160 C, D, E, F, G, Section 24
Salt Fog (Spray)	ABD0100.1.2 (Airbus); ASTM B117-11, ASTM B117-16; ATPD 2404B; BS EN 50130-5:1999 Alarm Systems Part 5: Environmental Test Methods; DEF STAN 00-35, Part 3, Issue 4:2006 Chapter 4-02 Test CN2; DET NORSKE VERITAS (DNV) STANDARD FOR CERTIFICATION NO. 2.4: ENVIRONMENTAL TEST SPECIFICATION FOR ,INSTRUMENTATION AND AUTOMATION EQUIPMENT (April 2006); GM 9123P; GS 95024-3-1:2019-08 (BMW); IEC 68-2-11, Test Ka, Salt Fog, Corrigendum 1999; IEC 68-2-52, IEC 60068-5-52, Test Kb Salt Fog, Cyclic; IS 10236 Part 6; ISO 9227; ISO 7253: 2010; ISO 12944-6 (1998); JSS 55555:2000 Rev. 2, JSS 55555:2012 Rev.3 Test Number 9; MIL-C-83733; MIL-C-5541E Class: 1A and 3; MIL-DLT-62547C(AT); MIL-STD-202F Method 101D, Conditions A and B; MIL-STD-202G Method 101E, Conditions A and B; MIL-STD-810C Method 509.1; MIL-STD-810D Method 509.2; MIL-STD-810E Method 509.3; MIL-STD-810F Method 509.4; MIL-STD-810G Method 509.5; MIL-STD-810G (Change 1) Method 509.6; MIL-STD-810H Method 509.7; MIL-STD-883E Method 1009.8, Conditions A, B, C, and F; MIL-STD-883F Method 1009.8, Conditions A, B, C, and F; MIL-STD-883G Method 1009.8, Conditions A, B, C, and F; MIL-STD-883H Method 1009.8, Conditions A, B, C, and F; MIL-STD-883J Method 1009.8, Conditions A, B, C, and F; MIL-STD-1344A Method 1001.1, Conditions A, B, C, and D; MIL-C-675C; MIL-C-48497A; RTCA DO-160D, E, F, G, Section 14; MIL-PRF-28800F 3.8.8; SAE J1455

Test:	Test Methods ⁴:
Temperature	ABD0100.1.2 (Airbus); ASTM D4169-09, D4169-14, D4169-16; ASTM D4332-14; ASTM F2825-10 (2015); ASTM F2825-18; ASTM D7386-12, ASTM D7386-16; ATPD 2404B; BS EN 50130-5:1999 Alarm Systems Part 5: Environmental Test Methods, Chapter 3-14 Test CL14 - Thermal Shock and Rapid Rate of Change of Temperature; DEF STAN 00-35, Part 3, Issue 4:2006; DET NORSKE VERITAS (DNV) STANDARD FOR CERTIFICATION NO. 2.4: ENVIRONMENTAL TEST SPECIFICATION FOR INSTRUMENTATION AND AUTOMATION EQUIPMENT (April 2006); ECSS-E-ST-10-03C (1 June 2012); EIA/JEDEC Standard EIA/JESD22-A104-B; EN 50130-5 Section 8 Dry Heat (Operational); EN 50130-5:1999 Section 8 Dry Heat (Operational); EN 50130-5:1999 Section 9 Dry Heat (Endurance); EN 50130-5:1999 Section 10 Cold (Operational); EN 50130-5:1999 Section 11 Temperature Change (Operational); ETSI 300-019-2-1, 2, 3, 4, 5, 6,7, 8; GM 9123P; GR-63-CORE, Paragraph 5.1.1.1, Low Temperature; GR-63-CORE, Paragraph 5.1.1.2, High Temperature; GR-1221-CORE, Paragraph 6.2.4, High Temperature; GR-1221-CORE, Paragraph 6.2.6, Low Temperature; GR-1221-CORE, Paragraph 6.2.7, Thermal Shock; GS 95024-3-1:2019-08 (BMW); IEC 68-2-1, IEC 60068-2-1, Test Aa, Ab, Ac, and Ad, Low Temperature; IEC 68-2-2, IEC 60068-2-2, Test Ba, Bb, Bc, and Bd, High Temperature; IEC 68-2-14, IEC 60068-2-14, Test Na, Nb, and Nc, Temperature Cycling; IEC 60721-4-1:2001+A1:03 – Low Temperature; IEC 60721-4-1:2001+A1:03 – High Temperature; IEC 60721-4-1:2001+A1:03 – Temperature cycle; IEC 60721-4-2:2001+A1:03 – Low Temperature; IEC 60721-4-2:2001+A1:03 – High Temperature; IEC 60721-4-2:2001+A1:03 – Temperature cycle; IEC 60721-4-3:2001+A1:03 – Low Temperature; IEC 60721-4-3:2001+A1:03 – High Temperature; IEC 60721-4-3:2001+A1:03 – Temperature cycle; IEC 60721-4-4:2001+A1:03 – Low Temperature; IEC 60721-4-4:2001+A1:03 – High Temperature; IEC 60721-4-4:2001+A1:03 – Temperature cycle; IEC 60721-4-7:2001+A1:03 – Low Temperature; IEC 60721-4-7:2001+A1:03 – High Temperature; IEC 60721-4-7:2001+A1:03 – Temperature cycle; IEC 60721-3-2;

Test:	Test Methods ⁴:
Temperature (cont.)	IEC 60601-1-11 – Editions 1, 2 (2015); IEC 60601-1-12; IEC 61131-2 (Edition 3); IS 10236 Part 2 – Dry Heat; IS 10236 Part 3 – Cold; IS 10236 Part 8 – Thermal Shock; ISO 14708-1:2000(E), ISO 14708-1:2008, ISO 14708-1:2014; ISO 9022-2:2015; ISO 11608-1:2015; ISO 16750-4; ISTA 1B-2011, ISTA 2B-2011, ISTA 1A-2014, ISTA 2A-2011, ISTA 3A-2008; JSS 55555:2000 Rev. 2, JSS 55555:2012 Rev.3 Test Number 13, 20, 22; MIL-DLT-62547C(AT); MIL-STD-202F Method 107D, Conditions A, A-1, A-2, A-3, B, B-1, B-2, B-3, F, F-1, F-2, and F-3, Thermal Shock; MIL-STD-202G Method 107G, Conditions A, A-1, A-2, A-3, B, B-1, B-2, B-3, F, F-1, F-2, and F-3, Thermal Shock; MIL-STD-202F, G Method 108A, High Temperature; MIL-STD-810C Method 501.1, Procedure I, High Temperature; MIL-STD-810C Method 501.1, Procedure II, Temperature Cycling; MIL-STD-810C Method 502.1, Procedure I, II, III Low Temperature; MIL-STD-810C Method 503.1, Procedure I, Thermal Shock; MIL-STD-810D Method 501.2, Procedure I, II High Temperature; MIL-STD-810D Method 502.2, Procedure I, II, III Low Temperature; MIL-STD-810D Method 503.2, Procedure I, Thermal Shock; MIL-STD-810E Method 501.3, Procedure I, II High Temperature; MIL-STD-810E Method 502.3, Procedure I, II Low Temperature; MIL-STD-810E Method 502.3, Procedure III, Low Temperature; MIL-STD-810E Method 503.3, Procedure I, Thermal Shock; MIL-STD-810F Method 501.4, Procedure I, II High Temperature; MIL-STD-810F Method 502.4, Procedure I, II, III Low Temperature; MIL-STD-810F Method 503.4, Procedure I, II Thermal Shock; MIL-STD-810G Method 503.5, Procedure I, II Thermal Shock; MIL-STD-810G Method 501.5, Procedure I, II High Temperature; MIL-STD-810G Method 502.5, Procedure I, II, III Low Temperature; MIL-STD-810G (Change 1) Method 503.6, Procedure I, II Thermal Shock; MIL-STD-810G (Change 1) Method 501.6, Procedure I, II High Temperature; MIL-STD-810G (Change 1) Method 502.6, Procedure I, II, III Low Temperature; MIL-STD-810H Method 503.7, Procedure I, II Thermal Shock; MIL-STD-810H Method 501.7, Procedure I, II High Temperature; MIL-STD-810H Method 502.7, Procedure I, II, III Low Temperature; MIL-STD-883E, F, G, H Method 1010.7, Conditions A, B, C, and F, Thermal Shock; RTCA DO-160D, E, F, G, Sections 4 and 5; TIA/EIA 455-4C, High Temperature; SAE J1455

Test:	Test Methods ⁴:
Solar Radiation (Sunshine)	ASTM G154-12a; ATPD 2404B; BS EN 50130-5:11; BS EN 50130-5:1999 Alarm Systems Part 5 : Environmental Test Methods; GS 95024-3-1:2019-08 (BMW); MIL-STD-810C, D, E, F, G Method 505.1, Procedure I; MIL-STD-810C, D, E, F, G Method 505.1, Procedure II; MIL-STD-810G (Change 1) Method 505.6, Procedures I and II; MIL-STD-810H Method 505.6, Procedures I and II; IEC 60068-2-5:75; Part 2-5: Tests - Test Sa; IEC 60068-2-5:10; IEC 60721-4-1:2001+A1:03 – Solar Radiation; IEC 60721-4-2:2001+A1:03 – Solar Radiation; IEC 60721-4-3:2001+A1:03 – Solar Radiation; IEC 60721-4-4:2001+A1:03 – Solar Radiation; IEC 60721-4-7:2001+A1:03 – Solar Radiation; IS 10236 Part 16; JSS 55555:2000 Rev.2, JSS 55555:2012 Rev.3 Test Number 25; MIL-PRF-28800F 3.8.13
Temperature and Humidity	ABD0100.1.2 (Airbus); ASTM D4169-09, D4169-14, D4169-16; ASTM D4332-14; ASTM F2825-10 (2015); ASTM D7386-12, ASTM D7386-16; ATPD 2404B; BS EN 50130-5:1999 Alarm Systems Part 5: Environmental Test Methods; DEF STAN 00-35, Part 3, Issue 4:2006; DET NORSKE VERITAS (DNV) STANDARD FOR CERTIFICATION NO. 2.4: ENVIRONMENTAL TEST SPECIFICATION FOR INSTRUMENTATION AND AUTOMATION EQUIPMENT (April 2006); ECSS-E-ST-10-03C (1 June 2012); EIA/JEDEC Standard EIA/JESD22-A101-B; EN 50130-5:1999 Section 12 Damp Heat, Steady State (Operational); EN 50130-5:1999 Section 13 Damp Heat (Endurance); EN 50130-5:1999 Section 14 Damp Heat Cycling (Operational); EN 50130-5:1999 Section 15 Damp Heat Cycling (Endurance); BS EN 50155:2007; ETSI 300-019-2-1, 2, 3, 4, 5, 6, 7, 8; GM 9123P; GR-63-CORE, Issue 1, Paragraph 5.1.1.3, Humidity; GR-63-CORE, Issue 1, 2 and 3, Paragraph 5.1.2, Humidity; GR-1221-CORE, Paragraph 6.2.5 and 6.2.8, Humidity; GS 95024-3-1:2019-08 (BMW); IEC 68-2-3, Test Ca, Humidity [replaced by IEC 60068-2-78] ³ ; IEC 68-2-30, IEC 60068-2-30, 3ed 2005, Test Db, Humidity; IEC 68-2-38 led 1974, Test Z/AD, Humidity;



Test:	Test Methods ⁴:
Temperature and Humidity (cont.)	IEC 60068-2-56, Test Cb, Humidity [superseded by IEC 680068-2-78:2001] ³ ; IEC 60721-4-1:2001+A1:03 – Humidity/Damp Heat; IEC 60721-4-2:2001+A1:03 – Humidity/Damp Heat; IEC 60721-4-3:2001+A1:03 – Humidity/Damp Heat; IEC 60721-4-4:2001+A1:03 – Humidity/Damp Heat; IEC 60721-4-7:2001+A1:03 – Humidity/Damp Heat; IEC 60601-1-11 – Editions 1, 2 (2015); IEC 60601-1-12; IEC 60721-3-2; IEC 61131-2 (Edition 3); IS 10236 Part 4 – Damp Heat; IS 10236 Part 5 – Damp Hear (Cyclic); ISO 10079-1:1999; ISO 15004-1:2007 ISO 9022-2:2015; ISO 12944-6 (1998); ISO 11608-1-2015; ISO 16750-4; ISTA 1B-2011, ISTA 2B-2011, ISTA 1A-2014, ISTA 2A-2011; ISTA 3A-2008; JSS 55555:2000 Rev. 2, JSS 55555:2012 Rev.3 Test Number 10, 27; MIL-DLT-62547C(AT); MIL-STD-202F Method 103B, Conditions A, B, C, and D, Humidity; MIL-STD-202F Method 106E, Humidity; MIL-STD-202G Method 103B, Conditions A, B, C, and D, Humidity; MIL-STD-202G Method 106G, Humidity; MIL-STD-810C Method 507.1, Procedures I, II, III, IV, and VI; MIL-STD-810D Method 507.2, Procedures I, II, and III; MIL-STD-810E Method 507.3, Procedures I, II, and III; MIL-STD-810F Method 507.4, Procedure I; MIL-STD-810G Method 507.5, Procedures I and II; MIL-STD-810G (Change 1) Method 507.6; MIL-STD-810H Method 507.6; MIL-STD-883E Method 1004.7; MIL-STD-883F Method 1004.7; MIL-STD-883G Method 1004.7; MIL-STD-883H Method 1004.7; MIL-STD-883J Method 1004.7; MIL-STD-1344A Method 1002.2, Type I, Conditions A, B, C, and D; MIL-STD-1344A Method 1002.2, Type II, and III; MIL-C-675C; MIL-C-48497A; RTCA DO-160C, D, E, F, G, Section 6; TIA/EIA 455-5C, Method A, Conditions A, B, C, D, and E, Humidity; TIA/EIA 455-5C, Methods B and C, Humidity; ASTM F1980-16 (AGING); MIL-PRF-28800F 3.8.2; SAE J1455



<u>Test:</u>	<u>Test Methods</u> ⁴ :
Vibration	ABD0100.1.2 (Airbus); ASTM D999, ASTM D999-96, D999-2001 Method A1, B, C, Sine Vibration; ASTM D4169-09, D4169-14, D4169-16 – Schedules D, E, F; ASTM D7386-12, ASTM D7386-16; ASTM D4728-17, ASTM D4728-95, D4728-2006 Random Vibration; ATPD 2404B; BRB/LU Ltd /RIA SPECIFICATION No 20:1988 (Testing for Railway Vehicles); DET NORSKE VERITAS (DNV) STANDARD FOR CERTIFICATION NO. 2.4: ENVIRONMENTAL TEST SPECIFICATION FOR INSTRUMENTATION AND AUTOMATION EQUIPMENT (April 2006); ECSS-E-ST-10-03C (1 June 2012); GR-63-CORE, Paragraph 5.4.2, Sine Vibration; GR-63-CORE, Paragraph 5.4.3, Sine Vibration; GR-1221-CORE, Paragraph 6.2.2, Sine Vibration; General Motors Engineering Standards GM 9123P; General Motors Engineering Standards GM 3155; GS 95024-3-1:2019-08 (BMW); IEC 68-2-6, IEC 60068-2-6, Test Fc, Sine Vibration; IEC 68-2-34:73 AMD 1 83, Test Fd, Random Vibration; IEC 68-2-36, Test Fdb, Random Vibration [superseded by IEC 60068-2-64] ³ ; IEC 68-2-64 1993 COR 1 1993, Test Fh, Random Vibration; IEC 60601-1-11; IEC 60601-1-12; EN-45502-1 IEC 60721-4-1:2001+A1:03 – Sine Vibration; IEC 60721-4-2:2001+A1:03 – Random Vibration; IEC 60721-4-2:2001+A1:03 – Sine Vibration; IEC 60721-4-3:2001+A1:03 – Sine Vibration; IEC 60721-4-4:2001+A1:03 – Sine Vibration; IEC 60721-4-7:2001+A1:03 – Random Vibration; IEC 60721-4-7:2001+A1:03 – Sine Vibration; IEC 60721-3-2; IEC 61131-2 (Edition 3) IS 10236 Part 11; ISTA 1A-2014, ISTA 2A-2011, ISTA 3A-2008, ISTA 2B-2011, ISTA 1G-2014, ISTA 1H-2001; JIS E 3014: 1999 Part of Railway signal – Vibration Test Methods; JSS 55555:2000 Rev. 2, JSS 55555:2012 Rev.3 Test Number 4, 28;

Test:	Test Methods ⁴:
Vibration (cont.)	MIL-B-49430, Paragraph 4.8.6, Sine Vibration; MIL-B-49458C (ER), Paragraph 4.8.6, Sine Vibration; MIL-DLT-62547C(AT); MIL-PRF-49471B (CR), Paragraph 4.7.6; MIL-STD-202F Method 201A, Sine Vibration; MIL-STD-202F Method 204D, Test Conditions A, B, C, D, E, F, G, H, Sine Vibration; MIL-STD-202F Method 214 Condition I, Test Conditions A, B, C, D, E, F, G, H, J, K, Random Vibration; MIL-STD-202F Method 214 Condition II, Test Conditions A, B, C, D, E, F, G, H, J, K, Random Vibration; MIL-STD-202G Method 201 A, Sine Vibration; MIL-STD-202G Method 204D, Test Conditions A, B, C, D, E, F, G, H, Sine Vibration; MIL-STD-202G Method 214 Condition I, Test Conditions A, B, C, D, E, F, G, H, J, K, Random Vibration; MIL-STD-202G Method 214 Condition II, Test Conditions A, B, C, D, E, F, G, H, J, K, Random Vibration; MIL-STD 167-1A:05 - Vibrations of Shipboard Equipment; MIL-STD-810C Method 514.2, Procedure I, Curve AR-L, Sine Vibration; MIL-STD-810C Method 514.2, Procedure 1, Curve B, Sine Vibration; MIL-STD-810C Method 514.2, Procedure 1, Curve M, Sine Vibration; MIL-STD-810C Method 514.2, Procedure IA, Figure 514.2-2A, Random Vibration; MIL-STD-810C Method 514.2, Procedure IIA, Figure 514.2-4, Random Vibration; MIL-STD-810C Method 514.2, Procedure IIB, Figure 514.2-4A, Random Vibration; MIL-STD-810C Method 514.2, Procedure V, VI, VII; MIL-STD-648D Figure 514.2-4A, Sine & Random Vibration; MIL-STD-810C Method 514.2, Procedure VIII, Curve V, Sine Vibration; MIL-STD-810C Method 514.2, Procedure VIII, Curve W, Sine Vibration; MIL-STD-810C Method 514.2, Procedure VIII, Curve Y, Sine Vibration; MIL-STD-810D Method 514.3, Category 1, Procedure I, Random Vibration; EIA/JEDEC STANDEARD EIA/JESD22 –B103-B; MIL-STD-810D Method 514.3, Category 10, Procedure 1, Sine & Random Vibration; MIL-STD-810D Method 514.3, Category 4, 5, 6, 7B, 7C, 8, 9, Procedure I, Random Vibration; MIL-STD-810D Method 514.3, Category 7A, Procedure IV, Random Vibration; MIL-STD-810D Method 519.3, Random Vibration; MIL-STD-810E Method 514.4, Category 1, 4, 5, 6, 7B, 7C, 8, 9, Procedure I, Random Vibration; MIL-STD-8 IOE Method 514.4, Category 10, Procedure 1, Sine & Random Vibration; MIL-STD-810E Method 514.4, Category 7A, Procedure IV, Random Vibration; MIL-STD-810E Method 519.4, Gunfire Vibration;

Test:	Test Methods ⁴:
Vibration (cont.)	MIL-STD-810F Method 514.5, Category 1, 2, 3, 4, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 25, Procedure I, Random Vibration; MIL-STD-810F Method 514.5, Category 15, 17, 18, 19, Procedure IV, Random Vibration; MIL-STD-810F Method 514.5, Category 20, Procedure III, Random Vibration; MIL-STD-810F Method 514.5, Category 24, Procedure 1, Sine Vibration; MIL-STD-810F Method 519.5, Gunfire Vibration; MIL-STD-810F Method 528, Shipboard Equipment; MIL-STD-810G Method 514.6, Category 1, 2, 3, 4, 7, 8, 9, 11, 12, 13, 14, 16, 17, 18, 19, 20, 221, 22, 23, 24, 25, Procedure I, Random Vibration; MIL-STD-810G Method 514.6, Category 15, 17, 18, 19, Procedure IV, Random Vibration; MIL-STD-810G Method 514.6, Category 20, Procedure III, Random Vibration; MIL-STD-810G Method 519.6, Gunfire Vibration; MIL-STD-810G (Change 1) Method 514.7; MIL-STD-810G (Change 1) Method 519.7; MIL-STD-810H Method 514.8; MIL-STD-810H Method 519.8; MIL-STD-883E, F, G, H, J Method 2005.2, Test Conditions A, B, C, Sine Vibration; MIL-STD-883E, F, G, H, J Method 2006.1, Sine Vibration; MIL-STD-883E, F, G, H, J Method 2007.2, Test Conditions A, B, C, Sine Vibration; MIL-STD-883E, F, G, H, J Method 2026, Condition 1, Test Conditions A, B, C, E, F, G, H, J, K, Random Vibration; MIL-STD-883E, F, G, H, J Method 2026, Condition 11, Test Conditions A, B, C, E, F, G, H, J, K, Random Vibration; MIL-STD- I 344A Method 1015, Condition B (Group III) Sine Vibration; MIL-STD- I 344A Method 2005.1, Conditions I, II, III, IV, V (A, B, C, D, E, F, G, H, J, K), VI (A, B, C, D, E, F, G, H, J, K); RTCA DO-160D Section 8; RTCA DO-160E Section 8; RTCA DO-160F Section 8; RTCA DO-160G Section 8; TIA/EIA 455-1 IB, TIA/EIA 455-11C, Condition I, Sine Vibration; TIA/EIA 455-1113, TIA/EIA 455-11C, Condition II, Sine Vibration; TIA/EIA 455-1113, TIA/EIA 455-11C, Condition III, Sine Vibration; TIA/EIA 455-11B, TIA/EIA 455-11C, Condition IV, Sine Vibration; TIA/EIA 455-1113, TIA/EIA 455-11C, Condition IV, Sine Vibration; TIA/EIA 455-1113, TIA/EIA 455-11C, Condition VI, Random Vibration; TIA/EIA 455-1 IB, TIA/EIA 455-11C, Condition VII, Random Vibration; TIA/EIA 455-1 IC, TIA/EIA 455-11C, Condition I, Sine Vibration; TIA/EIA 455-11C, TIA/EIA 455-11C, Condition II, Sine Vibration; TIA/EIA 455-1 IC, TIA/EIA 455-11C, Condition III, Sine Vibration; TIA/EIA 455-11C, TIA/EIA 455-11C, Condition IV, Sine Vibration; TIA/EIA 455-11C, TIA/EIA 455-11C, Condition IV, Sine Vibration;

Test:	Test Methods ⁴:
Vibration (cont.)	TIA/EIA 455-11C, TIA/EIA 455-11C, Condition VI, Random Vibration; TIA/EIA 455-11C, TIA/EIA 455-11C, Condition VII, Random Vibration; QM-333 Paragraph 12.0, Category A, B, C, D, Sine Vibration; UL 1642, Paragraph 15, Sine Vibration; UL 1254, Section 46; UN Transport of Dangerous Goods, Test T.2, Sine Vibration; ISO 10651-3 Lung Ventilators Medical Use Part 3; ISO 14708-1:2000 (E), Section 4: Protection against mechanical hazards; ISO 14708-1:2008; ISO 14708-1:2014; ISO 80601-2-55:2011 Clause 201.15.3.5.101; ISO 80601-2-12:2011 Clause 201.15.3.5.101; ISO 9022-3:2015; ISO 15004-1:2007 ISO 11608-1:2015; ISO 16750-3; BS EN 50155:2007; BS EN 61373:1999, 2010; DEF-STD 00-35 part 3; DEF-STD 00-35 part 5; ETSI 300-019-2-1, 2, 3, 4, 5, 6, 7, 8; NATO AECTP-400 Edition 3; BMW Group GS95003-1; ASTM D999, Method A1, B, C, Sine Vibration; ASTM D999, ASTM D999-96, D999-2001 (Method A1, B, C, Sine Vibration); EN 50130 Section 22, 23 Vibration, Sinusoidal; EN 50130:1999 Section 22 Vibration, Sinusoidal (Operational); EN 50130:1999 Section 23 Vibration, Sinusoidal (Endurance); BS EN 50130-5:1999 Alarm Systems Part 5: Environmental Test methods; EN 1789:2007+A2; SAE J1455
HALT ¹	Highly Accelerated Life Test (HALT); Cold Temperature Steps; Hot Temperature Steps; Cold Start Test; Temperature Cycling; Random Vibration-3 axis; Temperature & Vibration Combined Cycling; Temperature Measurements
HASS ^{1,2}	Highly Accelerated Stress Simulation (HASS); Stress Profile Definition; Analyzing POS Stage; Mounting Jig Assembly; Running Multi-Tester Jig; Set-up for Mass Production; Temperature & Vibration Combined Cycling
IR Imaging	Using Inframetrics PM920 Thermacam IR Camera Using Method: ThermoCAM Hand-held IR Imaging Radiometers Operating Instructions

Test:	Test Methods ⁴:
Sand & Dust	ABD0100.1.2 (Airbus); ATPD 2404B; DEF STAN 00-35, Part 3, Issue 4:2006 Chapter 3-25 Test CL25; GS 95024-3-1:2019-08 (BMW) IEC 60529-2001 COR 1 2003, Degrees of Protection provided by Enclosures (IP Code) Degrees of protection (IP-Code), IP5X,6X; IS 10236 Part 13; ISO 20653:2013 MIL-PRF-28800F 3.8.10; JSS 55555:2000 Rev.2, JSS 55555:2012 Rev.3 Test Number 14; MIL-DLT-62547C(AT); MIL-STD-810 C, D, E, F, G, Method 510, Procedures I, II, and III; MIL-STD-810G (Change 1) Method 510.6, Procedures I and II; MIL-STD-810H Method 510.7, Procedures I and II; RTCA DO-160 C, D, E, F, G, Section 12, Procedure II; MIL-PRF-28800F 3.8.4; SAE J1455
Acceleration (Sustained)	MIL-STD-810 A, B, C, D, E, F, G, G-Change1, H, Method 513; MIL-STD-883F (Method 2001-2); MIL-STD-202G (Method 212A); DEF STAN 00-35, Part 3, Issue 4, Chapter 2-13 (Steady State Acceleration); STANAG 4370 AECTP (Method 404); JSS 55555:2000 Rev.2, JSS 55555:2012 Rev.3, Test Number 1; JSS 0256-01:1992 (Test No. 16); RTCA DO-160D, E, F, G, Section 7 (Crash Safety – Sustained); IEC 60068-2-7, Test Ga; ETSI (Method 300-019-2-2, 300-019-2-6); AECTP-400 Edition 3 (Method 404); BS G 260:1996; ISO 2669:1995; ABD0100.1.2 (Airbus); ECSS-E-ST-10-03C (1 June 2012)
Peel & Dye Test	ASTM F88 / F88M-15; ASTM F1929-15; ASTM F1886-16 (Visual Inspection); ISO 11607-1 (2019)
Detecting Gross Leaks (Bubble Test)	ASTM F2096-11
Protection Against Foreign Objects	IEC 60529, IP Rating - IP1x, IP2x, IP3x, IP4x; ISO 20653:2013

^{1,2} HALT, HASS, & HASA Explained: Accelerated Reliability Techniques
Harry W. McLean; ASQ Quality Press, 2000.

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

⁴When 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*.





Accredited Laboratory

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Petach Tikva, ISRAEL

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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 7th day of October 2020.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2881.01
Valid to May 31, 2022
Revised March 10, 2022

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