



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

CHEMITOX, INC.
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Tokyo 145-0064, JAPAN
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MECHANICAL

Valid To: July 31, 2024

Certificate Number: 1136.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests on the following materials/products: Adhesives and Sealants; Varnish; Industrial Laminate; Ceramics; Films and Packaging; Leather; Packaging and Containers; Paper, Paperboard and Pulp; Plastics and Polymers; Rubber and Rubber Products; Textiles; Information Technology Equipment (ITE); Printed Wiring Board; Magnet Wire; and Wire Positioning Devices.

Test:

Test Method(s) ¹:

Migration Test for PWB

JPCA ET01-07

Flexibility

JIS C5016 (Section 8.6)

HAST (Highly Accelerated Stress Test)

JPCA ET08

¹When the date, revision or edition of a test method standard is not identified on the scope of accreditation, the laboratory is required to be using the current version within one year of the date of publication, per part C., Section 1 of A2LA R101 - *General Requirements - Accreditation of ISO-IEC 17025 Laboratories*.



Accredited Laboratory

A2LA has accredited

CHEMITOX, INC.

Tokyo, Japan

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 21st day of November 2022.

A blue ink signature of Mr. Trace McInturff, Vice President of Accreditation Services.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1136.01
Valid to July 31, 2024

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



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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ELECTRICAL

Valid To: July 31, 2024

Certificate Number: 1136.02

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests on the following materials/products: Adhesives and Sealants; Varnish; Industrial Laminate; Ceramics; Films and Packaging; Leather; Packaging and Containers; Paper, Paperboard and Pulp; Plastics and Polymers; Rubber and Rubber Products; Textiles; Information Technology Equipment (ITE); Printed Wiring Board; Magnet Wire; and Wire Positioning Devices.

Test:

Test Method(s)¹:

Volume Resistivity and Surface Resistance of Printed Wiring Materials (Insulation Resistance)

JIS C6481 (Sections 5.9 and 5.10);
JIS C5016 (Section 7.6);
JIS C6471 (Sections 7.1 and 7.2);
JIS C5012 (Section 7.6);
IPC-TM-650 (2.5.17)

Power Cycling Test

IEC 60749-34;
JEITA ED 4701/600;
ECPE Guideline AQG 324

¹ When the date, revision or edition of a test method standard is not identified on the scope of accreditation, the laboratory is required to be using the current version within one year of the date of publication, per part C., Section 1 of A2LA R101 - *General Requirements - Accreditation of ISO-IEC 17025 Laboratories*.



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Presented this 21st day of November 2022.

A blue ink signature of Mr. Trace McInturff, written over a horizontal line.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1136.02
Valid to July 31, 2024

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



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

CHEMITOX, INC.,
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Webpage: <https://www.chemitox.co.jp>

MECHANICAL

Valid To: July 31, 2024

Certificate Number: 1136.03

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following mechanical tests on the following materials/products: Photovoltaic Modules; Adhesives and Sealants; Varnish; Industrial Laminate; Ceramics; Films and Packaging; Leather; Packaging and Containers; Paper, Paperboard and Pulp; Plastics and Polymers; Rubber and Rubber Products; Textiles; Information Technology Equipment (ITE); Printed Wiring Board; Magnet Wire; and Wire Positioning Devices.

Test:

Test Method(s)¹:

Tensile Strength Test

ASTM D412, D638, D882; UL 746A (Sections 10-12);
CAN/CSA C22.2 No.0.17 (Section 5.5);
ISO 527-1, 527-2, 527-3, 527-4, 527-5;
JIS K6911, K7127, K7161-1, K7161-2, K7164, K7165

Flexural Strength Test

ASTM D790; CAN/CSA C22.2 No.0.17 (Section 5.4);
ISO 178; JIS K7171; UL 746A (Section 16)

Tensile Impact Test

ASTM D1822; JIS K7160; CAN/CSA C22.2 No.0.17 (Section 5.7);
UL 746A (Section 14); ISO 8256

Ball Pressure Test

CAN/CSA C22.2 No.0.17 (Section 9.6);
Electrical Appliance and Materials Safety Law (in Japan 3-31-86);
UL 746C (Section 62); IEC 60695-10-2; JIS C 60695-10-2;
IEC 60335-1 (Section 30)

Izod Impact

ASTM D256; JIS K7110, JIS K6911 (Section 5.21);
ISO180; UL 746A (Section 13); CSA C22 No.17 (Section 5.3)

Charpy Impact Testing

ASTM D6110, JIS K7111-1, JIS K6911 (Section 5.20);
ISO 179-1; UL746A (Section 15); CSA C22 No.17 (Section 5.2)

Heat Deflection Temperature (HDT)

UL746A; ASTM D648; ISO 75-1, 75-2; JIS K7191-1, K7191-2

Vicat Softening Point/Temperature
(VST)

UL746A, UL746C; ASTM D1525;
ISO 306; JIS K7206

(A2LA Cert. No.1136.03) 10/07/2022

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<u>Test:</u>	<u>Test Method(s)¹:</u>
Relative Thermal Endurance Index (RTE, RTI)	IEC 60216-5, 61730-1; UL 746B; JIS C61730-1
20 mm Flame Confirmation Test	ASTM D5207; IEC 60695-11-4
125 mm Flame Confirmation Test	ASTM D5207; IEC 60695-11-3
12 mm Flame Confirmation Test	IEC 60695-11-5; GB/T 5169.5
Horizontal Burning Test	ASTM D635; CAN/CSA C22.2 No.0.17 (Section 4.2.3); CAN/CSA C22.2 No.60950-1 (Sections 4.7.3.1 - 4.7.3.6); EN 60950-1 (Sections 4.7.3.1 - 4.7.3.6); IEC 60950-1 (Sections 4.7.3.1 - 4.7.3.6), IEC 60695-11-10; JIS K6911; UL 94 (Section 7); UL 60950-1 (Sections 4.7.3.1 - 4.7.3.6); GB/T 5169.16, GB 4943.1, (Sections 4.7.3.1-4.7.3.6); BS EN 60695-11-10
Thin Material Vertical Burning Test	ASTM D4804; CAN/CSA C22.2 No.0.17 (Section 4.2.4); ISO 9773; UL 94 (Section 11)
Vertical Burning Test	ASTM D3801; CAN/CSA C22.2 No.0.17 (Section 4.2.2); CAN/CSA C22.2 No.60950-1 (Sections 4.7.3.1 - 4.7.3.6); EN 60950-1 (Sections 4.7.3.1 - 4.7.3.6); IEC 60950-1 (Sections 4.7.3.1 - 4.7.3.6), IEC 60695-11-10; JIS K6911; UL 94 (Section 8); UL 60950-1 (Sections 4.7.3.1 - 4.7.3.6); GB/T 5169.16, GB 4943.1, 4.7.3.1-4.7.3.6; BS EN 60695-11-10
Vertical Burning Test using a 125 mm Flame Source	UL 94 (Section 9), UL 60950-1, (Sections 4.7.3.1-4.7.3.6); IEC 60695-11-20; ASTM D5048; EN 60950-1, (Sections 4.7.3.1-4.7.3.6); CAN/CSA C22.2 No.0.17 (Section 4.2.1), CAN/CSA C22.2 60950-1, (Sections 4.7.3.1-4.7.3.6)
Vertical Burning Rate of Materials Test	UN ECE R118 (Annex 8)
Horizontal Burning Foamed Material Test	UL 94 (Section 12); CAN/CSA C22.2 No.0.17 (Section 4.2.5), UL 60950-1 (Sections 4.7.3.1 - 4.7.3.6); ASTM D4986; IEC 60950-1 (Sections 4.7.3.1 - 4.7.3.6); EN 60950-1 (Sections 4.7.3.1 - 4.7.3.6); CAN/CSA C22.2 No.60950-1 (Sections 4.7.3.1 - 4.7.3.6); ISO 9772; GB 4943.1, (Sections 4.7.3.1-4.7.3.6)
Burning Test using a 20 mm Flame Source Used in Electrical Equipment Evaluations	UL 746C (Sections 16 and 51), UL 60950-1 (Annex A2); IEC 60950-1 (Annex A2); EN 60950-1 (Annex A2); CAN/CSA C22.2 No.60950-1 (Annex A2); GB 4943.1, Annex A2

<u>Test:</u>	<u>Test Method(s)¹:</u>
Burning Test using a 127 mm Flame Source Used in Electrical Equipment Evaluations	UL 746C (Sections 17 and 52), UL 60950-1 (Annex A1); IEC 60950-1 (Annex A1); EN 60950-1 (Annex A1); CAN/CSA C22.2 No.60950-1 (Annex A1); GB 4943.1, Annex A1
Enclosure Burning Test used in Electrical Evaluations	UL 746C (Sections 18 and 53)
Burning Test using a Needle Flame Source	UL 746C (Section 15), UL 60950-1, Annex A2.7, UL 1694; GB/T 5169.5; CAN/CSA C22.2 No.0.17 (Section 9.2.1); IEC 60695-11-5, IEC 60335-1 (Section 30 and Annex E), IEC 60950-1, Annex A2.7; EN 60950-1, Annex A2.7; CAN/CSA C22.2 60950-1, Annex A2.7; GB 4943.1, Annex A2.7; IEC 62368-1 Annex S
Burning Test of Automotive Interior Materials	ASTM D5132; FMVSS 302; ISO 3795; JIS D1201; SAE J369; GB 8410; UN ECE R118 (Annex 6)
Ignitability Test	ISO 11925-2; IEC 61730-2 (MST 24); DIN 4102-1 (Class B2 only), 53438-2, 53438-3; GB 8626; JIS C61730-2 (MST 24)
VW-1 Flammability Test	UL224 (Section, 5.11), UL510 (Section 6), UL510a (Section 9, 20), UL1441 (Section 5.7), UL1581 (Section, 1080), UL2556 (Section, 9.4); ASTM D2671 (Section 72 Procedure C); IEC TS 60695-11-21
Resistance to Flame Propagation Test for Automotive Cables and Wires	UN ECE R118 (Annex10); ISO 6722-1 (Section 5.22)
Test Methods for Rubber or Plastic Insulated Wires and Cables	JIS C3005 (Section 4.26)
Folding Endurance	JIS C5016 (Section 8.7), JIS C6471 (Section 8.2)

<u>Test:</u>	<u>Test Method(s)¹:</u>
Thermal Shock by Air	JIS C5012 (Section 9.2), JIS C5016 (Section 9.2)
Hot Oil	JIS C5012 (Section 9.3), JIS C5016 (Section 9.3)
Reflow Solder	JIS C5012 (Section 10.4.2)
Cross-Sectional Observation Test	JIS C5012 (Section 6.2), JIS C5016 (Section 6.2), JIS C61730-2 (MST 04); IEC 61730-2 (MST 04)
Vibration	JIS C5402-6-4, JIS C60068-2-6, JIS C60068-2-53, JIS C60068-2-64, JIS C60068-2-80, JIS D1601, JIS C60068-2-57; IEC 60068-2-6, IEC 60068-2-53, IEC 60068-2-57, IEC 60068-2-64, IEC 60068-2-80; ISO 19453-3 (Section 4.1), ISO 16750-3 (Section 4.1); JASO D014-3 (Section 4.1), JASO D902 (Section 6.4), JASO M312 (Section 5.6)
Shock	JIS C60068-2-27, JIS C60068-2-53; IEC 60068-2-27, IEC 60068-2-53; ISO 19453-3 (Section 4.2), ISO 16750-3 (Section 4.2); JASO D014-3 (Section 4.2)

Testing Performed on Photovoltaic Modules

Visual Inspection	IEC 61730-2 (MST 01), IEC 61215-2 (Section 4.1, MQT 01); JIS C61730-2 (MST 01), JIS C61215-2 (Section 4.1, MQT 01)
Thermal Cycling	IEC 61730-2 (MST 51), IEC 61215-2 (Section 4.11, MQT 11); JIS C61730-2 (MST 51), JIS C61215-2 (Section 4.11, MQT 11)

Test:**Test Method(s)¹:****Testing Performed on Photovoltaic Modules (cont'd)**

Humidity Freeze	IEC 61730-2 (MST 52), IEC 61215-2 (Section 4.12, MQT 12); JIS C61730-2 (MST 52), JIS C61215-2 (Section 4.12, MQT 12)
Damp Heat	IEC 61730-2 (MST 53), IEC 61215-2 (Section 4.13, MQT 13); JIS C61730-2 (MST 53), JIS C61215-2 (Section 4.13, MQT 13)
Salt Mist Corrosion	IEC 61701 (Test method 1~7), IEC 60068-2-52 (Test method 1~7); JASO D014-4 (Section 5.5), JASO D616 (Section 6.20), JASO M609-91
Cold Conditioning	IEC 61730-2 (MST 55)
Dry Heat Conditioning	IEC 61730-2 (MST 56)
Cut Susceptibility Test	IEC 61730-2 (MST 12); JIS C61730-2 (MST 12)
Bending Test	IEC 61215-2 (Section 4.22, MQT 22)
Hot Spot Endurance Test	IEC 61730-2 (MST 22), IEC 61215-2 (Section 4.9, MQT 09); JIS C61730-2 (MST 22), JIS C61215-2 (Section 4.9, MQT 09)
Fire Test	IEC 61730-2 (MST 23 Annex B, B.3); UL 790 (Sections 7 and 8), UL 1703 (Section 31) JIS C8993, JIS C61730-2 (MST 23)
Bypass Diode Thermal Test	IEC 61730-2 (MST 25), IEC 61215-2 (Section 4.18.1, MQT 18.1); JIS C61730-2 (MST 25), JIS C61215-2 (Section 4.18.1, MQT 18.1)
Bypass Diode Functionality Test	IEC 61215-2 (Section 4.18.2, MQT 18.2); JIS C61215-2 (Section 4.18.2, MQT 18.2)
Bypass Diode – Thermal Runaway Test	IEC 62979
Module Breakage	IEC 61730-2 (MST 32); JIS C61730-2 (MST 32)

Test: **Test Method(s)¹:**

Testing Performed on Photovoltaic Modules (cont'd)

Dynamic Mechanical Load	IEC TS 62782
Static Mechanical Load Test	IEC 61215-2 (Section 4.16, MQT 16), 61730-2 (MST34); JIS C61215-2 (Section 4.16, MQT 16), JIS C61730-2 (MST34)
Stabilization	IEC 61215-2 (Section 4.19, MQT 19);
Stabilization (cont'd)	JIS C61215-2 (Section 4.19, MQT 19)
UV-Xenon Arc Exposure Test	UL 746C; ASTM G155; ISO 4892-2; IEC 61730-1, IEC 62368-1 Annex C
Water Exposure/Immersion	UL 746C (Sections 26 and 58)
Surface Flame Spread Test	ASTM E162; IEC 61730-1 ² (Edition 1, 2004, Section 5.4.2); ISO 5658-2; IMO Resolution MSC 307(88) – 2010 FTP Code Annex 1: Part 5
Environmental Test	
Visual Inspection	EN50155 (Section 13.4.1); IEC 60571 (Section 12.2.2)
Performance Test	EN50155 (Section 13.4.2); IEC 60571 (Section 12.2.3)
Low Temperature Start-up Test	EN50155 (Section 13.4.4); IEC 60571 (Section 12.2.4)
Dry Heat Test	EN50155 (Section 13.4.5); IEC 60571 (Section 12.2.5)
Low Temperature Storage Test	EN50155 (Section 13.4.6)
Cyclic Damp Heat Test	EN50155 (Section 13.4.7); IEC 60571 (Section 12.2.6)
Salt Mist Test	EN50155 (Section 13.4.10); IEC 60571 (Section 12.2.11)
Smoke Density Measurement	ASTM E662, ASTM F814; ISO 5659-2; 14 CFR Appendix F to Part 25, Part V; FAA Aircraft Materials Fire Test Handbook, Chapter 6
Toxicity	BSS 7239; DIN 5510-2 Appendix D.4 (Colorimetric Measurements)
Flammability Testing for Aircraft Interior Materials (Vertical, Horizontal, 45-Degree, 60 Degree, Flammability Test)	14 CFR 25 (Appendix F, Part 1); CS 25 (Appendix F, Part 1); JAR 25 (Appendix F, Part 1); JCAB AIM Part III (Appendix F, Part 1); RTCA/DO-160G (Section 26); FAA Aircraft Materials Fire Test Handbook Chapter 1, FAA Aircraft Materials Fire Test Handbook Chapter 2, FAA Aircraft Materials Fire Test Handbook Chapter 3, FAA Aircraft Materials Fire Test Handbook Chapter 4
Test Methods for Determining the Degree of Cure in Ethylene-Vinyl Acetate	TPE-1-21

Test:

Test Method(d):

Testing Performed on Photovoltaic Modules (cont'd)

Test to Determine the Melting Behavior of Material	UN ECE R118 (Annex 7)
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Heat Release Rate (Cone Calorimeter Method) and Smoke Production Rate (Dynamic Measurement)	ISO 5660-1 ASTM E1354
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¹ UL 60950-1, IEC 60950-1, CAN/CSA C22.2 No.60950-1, and EN60950-1 base requirements are nearly identical. Section numbers relate to all four editions, unless otherwise indicated.

² 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



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Presented this 7th day of October 2022.

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Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
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ELECTRICAL

Valid To: July 31, 2024

Certificate Number: 1136.04

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

Tests:

Dielectric Breakdown Voltage and
Dielectric Strength Test

Comparative Tracking Index Test

High Voltage, Low Current,
Dry Arc Resistance Test

Hot Wire Ignition Test

Test Method(s)¹:

UL 746A (Section 21);
CAN/CSA C22.2 No.0.17 (Section 6.2);
ASTM D149,
ASTM D3755;
IEC 60243-1, -2;
JIS K6911,
JIS C 2110-1, -2, -3;
IPC-TM-650 (2.5.6)

UL 746A (Section 24);
CAN/CSA C22.2 No.0.17 (Section 6.5);
ASTM D3638;
IEC 60112;
JIS C2134, C61730-1

UL 746A (Section 23);
ASTM D495;
JIS K6911;
CAN/CSA C22.2 No.0.17 (Section 6.4);
IPC-TM-650 (2.5.1)

UL 746A (Section 32);
ASTM D3874;
CAN/CSA C22.2 No.0.17 (Section 4.3.1)

Test**Test Method(s)¹:**

Glow Wire Ignition Test

IEC 60695-2-13,
IEC 60695-2-10;
JIS C60695-2-13,
JIS C60695-2-10;
UL 746A (Section 35);
CAN/CSA C22.2 No. 17 (Section 4.3.5);
GB/T 5169.10

Glow Wire Flame Test

IEC 60695-2-12,
IEC 60695-2-10;
JIS C60695-2-12,
JIS C60695-2-10;
GB 5169.10

Glow Wire Flammability Test for End-Product Test

UL 746C (Sections 12.3 and 73);
IEC 60695-2-10,
IEC 60695-2-11;
JIS C60695-2-11,
JIS C60695-2-10;
GB 5169.10,
GB 5169.11;
CAN/CSA C22.2 No. 17 (Section 9.3);
BS EN 60695-2-11

Volume/Surface Resistivity

UL 746A (Section 22);
ASTM D257;
JIS C5016,
JIS K6911,
JIS C6481,
JIS C6471,
JIS C2139-3-1,
JIS C2139-3-2;
IEC 62631-3-1,
IEC 62631-3-2;
CAN/CSA C22.2 No. 17 (Section 6.3)

Insulation Test

EN50155 (Section 13.4.9);
IEC 60571 (Section 12.2.10)

Testing performed on Photovoltaic Modules^{1, 2}

Maximum Power Determination

IEC 61215-2 (Section 4.2, MQT 02) ;
JIS C61215-2 (Section 4.2, MQT 02)

Measurement of Temperature Coefficient

IEC 61215-2 (Section 4.4, MQT 04);
JIS C61215-2 (Section 4.4, MQT 04)

Performance at STC and NMOT

IEC 61215-2 (Section 4.6, MQT 06);
JIS C 61215-2(Section 4.6, MQT 06)

Performance at Low Irradiance

IEC 61215-2 (Section 4.7, MQT 07);
JIS C61215-2 (Section 4.7, MQT 07)

Test**Test Method(s)¹:****Testing performed on Photovoltaic Modules^{1,2}**
(cont'd)

Photovoltaic (PV) Module Performance Testing and Energy Rating	IEC61853-1, IEC61853-2 (Section 7.2)
Ground Continuity	IEC 61730-2 (MST 13); JIS C61730-2(MST 13)
Dielectric Withstand Test	IEC 61730-2 (MST 16); JIS C61730-2 (MST 16)
Insulation Test	IEC 61215-2 (Section 4.3, MQT 03); JIS C61215-2(Section 4.3, MQT 03)
Wet Leakage Current Test	IEC 61730-2 (MST 17), IEC 61215-2 (Section 4.15, MQT 15); JIS C61730-2(MST 17), JIS C61215-2 (Section 4.15, MQT 15);
Reverse Current Overload	IEC 61730-2 (MST 26); JIS C61730-2 (MST 26)
Inclined Plane Tracking Test	IEC 60587; ASTM D2303; UL 746A (Section 26)
Detection of Potential-induced Degradation	IEC TS 62804-1; TPV-27
Electro-luminescence	IEC TS-60904-13

Testing Performed on Battery

Charge / discharge Low temperature discharge performance	IEC 62620; JIS C8715-1
High rate discharge performance	IEC 62620; JIS C8715-1
Capacity retention rate and capacity recovery rate	IEC 62620; JIS C8715-1
AC internal resistance	IEC 62620; JIS C8715-1
DC internal resistance	IEC 62620; JIS C8715-1
Charge / discharge cycle durability	IEC 62620; JIS C8715-1
Standby state retention durability	IEC 62620; JIS C8715-1
Continuous charging test	IEC 62133-2; JIS 62133-2

Test**Test Method(s)¹:****Testing Performed on Battery (cont'd)**

External short circuit test	IEC 62133-2, IEC 62619; JIS 62133-2, JIS C8715-2
Overcharge test	IEC 62133-2, IEC 62619; JIS 62133-2, JIS C8715-2
Over-discharge test	IEC 62133-2, IEC 62619; JIS 62133-2, JIS C8715-2
Heating test	IEC 62133-2, IEC 62619; JIS 62133-2, JIS C8715-2
Crush test	IEC 62133-2; JIS 62133-2
Thermal cycle test	IEC 62133-2; JIS 62133-2
Nail stab test	TP-81

¹ UL 60950-1, IEC 60950-1, CSA C22 No. 60950-1, EN60950-1 base requirements are nearly identical, section numbers relate to all four editions, unless otherwise indicated. For example, North American Annex NAE is specifically included for Battery Circuits on this scope. Included in the product safety activities are visual observations and similar activities for markings and other characteristics.

On the following materials and products: Adhesives and Sealants; Ceramics; Films and Packaging; Leather; Packaging and Containers; Paper, Paperboard and Pulp; Plastics and Polymers; Rubber and Rubber Products; Textiles; Information Technology Equipment (ITE); Photovoltaic Modules; Printed Wiring Board; Magnet Wire; Varnish; Industrial Laminate; and Wire Positioning Devices.



Accredited Laboratory

A2LA has accredited

CHEMITOX, INC., YAMANASHI TESTING CENTER KAI

Yamanashi-ken, JAPAN

for technical competence in the field of

Electrical 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 2022.

A blue ink signature of Mr. Trace McInturff.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1136.04
Valid to July 31, 2024

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



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

CHEMITOX, INC.
1-1-5 Minamisenzoku, Ohta-ku
Tokyo 145-0063, JAPAN
Mr. Yuji Kamiya (Corporate Representative)
Phone: 81 3 3727 7111
E-mail: yu-kamiya@chemitox.co.jp
Ms. Yuko Sasaki (Authorized Representative)
E-mail: y-sasaki@chemitox.co.jp
Webpage: <https://www.chemitox.co.jp>

CHEMICAL

Valid To: July 31, 2024

Certificate Number: 1136.07

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory at the location listed above to perform the following tests on the following materials/products: Adhesives and Sealants; Varnish; Industrial Laminate; Ceramics; Films and Packaging; Leather; Packaging and Containers; Paper, Paperboard and Pulp; Plastics and Polymers; Rubber and Rubber Products; Textiles; Information Technology Equipment (ITE); Printed Wiring Board; Magnet Wire; and Wire Positioning Devices.

Test:

Test Method(s) ¹:

Determination of Heavy Metals
(Cd, Hg, Pb, Total Cr)

IEC 62321-1;
IEC 62321-2;
IEC 62321-4;
IEC 62321-5;
EPA 3052

Determination of Chromium VI
(CR VI)

IEC 62321-1;
IEC 62321-2;
JIS H 8625;
IEC 62321-7-1;
IEC 62321-7-2

Determination of Polybrominated Biphenyl and
Polybrominated Diphenyl Ether (PBB, PBDE)

IEC 62321-6;
IEC 62321-3-3

Halogen Free Materials

JPCA ES01;
IEC 61189-2 (Clause 8.12);
IPC-TM-650 (Clause 2.3.41);
IEC 62321-3-2;
BS EN 14582;
IEC 60754-1

<u>Test:</u>	<u>Test Method(s) ¹:</u>
Testing Method for Industrial Wastewater	JIS K 0102
Determination of Anion and Cation by Ion Chromatography Analysis	JPCA-DG04; TPE-1-17
Screening Analysis by Florescent X-ray Analysis Method	IEC 62321-2; IEC 62321-3-1
Determination of Phthalates	BS EN 14372 (Clause 6.3.2); CPSC-CH-C-1001-09.4; IEC 62321-3-3 ; IEC 62321-8; Japanese Food Safety Regulation 0906 No. 4
Test methods for determining the degree of cure in Ethylene-Vinyl Acetate	IEC 62788-1-6
Thermogravimetry (TGA)	UL746A; ASTM D3850; ASTM E1641; ASTM E1877; ISO 11358-3
Differential Scanning Calorimetry (DSC)	UL746A; ASTM D3418; ASTM E698; ISO 11357-1; ISO 11357-6
Toxicity	NF X 70-100-1, NF X 70-100-2; EN 45545-2; EN 50305 (Section 9.2); EN 17084 Method 2; BS 6853: 1999 Annex B.1 (withdrawn) ²
Acidity and Conductivity	IEC 60754-2

¹ When the date, revision or edition of a test method standard is not identified on the scope of accreditation, the laboratory is required to be using the current version within one year of the date of publication, per part C., Section 1 of A2LA R101 - *General Requirements - Accreditation of ISO-IEC 17025 Laboratories*.

² 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.

CHEMITOX, INC.
1-14-18 Kamiikedai, Ohta-ku
Tokyo 145-0064, JAPAN
Mr. Yuji Kamiya (Authorized Representative)
Phone: 81 3 3727 7111
E-mail: yu-kamiya@chemitox.co.jp
Ms. Yuko Sasaki (Deputy Authorized Representative)
E-mail: y-sasaki@chemitox.co.jp
Webpage: <https://www.chemitox.co.jp>

Test:

FTIR

Determination of Organic Silicon Compound by FT-IR
ATR Analysis

Test Method(s)³:

UL 746A;
ASTM E 1252;
ASTM E 1421

TPE-1-16;
TP-60

³ When the date, revision or edition of a test method standard is not identified on the scope of accreditation, the laboratory is required to be using the current version within one year of the date of publication, per part C., Section 1 of A2LA R101 - *General Requirements - Accreditation of ISO-IEC 17025 Laboratories*.





Accredited Laboratory

A2LA has accredited

CHEMITOX, INC.

Tokyo, Japan

for technical competence in the field of

Chemical 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 21st day of November 2022.

A blue ink signature of Mr. Trace McInturff, written over a horizontal line.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1136.07
Valid to July 31, 2024

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



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

CHEMITOX, INC.
SHINJYO TESTING CENTER
Shinjyo Yokoneyama Industrial Complex
4102-8, Takadai Shinden, Izumita,
Shinjo-shi, Yamagata, 999-5103 JAPAN
Mr. Yuji Kamiya (Authorized Representative)
Phone: 81 233-25-2011 E-mail: yu-kamiya@chemitox.co.jp
Mr. Hitoshi Watanabe (Deputy Authorized Representative)
E-mail: h-watanabe@chemitox.co.jp
Webpage: <http://www.chemitox.co.jp>

MECHANICAL

Valid To: January 31, 2025

Certificate Number: 1136.08

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests on the following materials/products: Adhesives and Sealants; Varnish; Industrial Laminate; Ceramics; Films and Packaging; Leather; Packaging and Containers; Paper, Paperboard and Pulp; Plastics and Polymers; Rubber and Rubber Products; Textiles; Information Technology Equipment (ITE); Printed Wiring Board; Magnet Wire; and Wire Positioning Devices.

<u>TEST:</u>	<u>TEST METHODS:</u>
Horizontal Burning Test	ASTM D635; CAN/CSA C22.2 No.0.17 (Section 5.2.1); CAN/CSA C22.2 No.60950-1 (Sections 4.7.3.1 - 4.7.3.6); EN 60950-1 (Sections 4.7.3.1 - 4.7.3.6); IEC 60950-1 (Sections 4.7.3.1 - 4.7.3.6); UL 60950-1 (Sections 4.7.3.1 - 4.7.3.6); IEC 60695-11-10; JIS K6911; UL 94 (Section 7); GB/T 5169.16; GB 4943.1, (Sections 4.7.3.1-4.7.3.6); BS EN 60695-11-10
Thin Material Vertical Burning Test	ASTM D4804; CAN/CSA C22.2 No.0.17 (Section 5.2.3); ISO 9773; UL 94 (Section 11)
Vertical Burning Test	ASTM D3801; CAN/CSA C22.2 No.0.17 (Section 5.2.2); CAN/CSA C22.2 No.60950-1 (Sections 4.7.3.1 - 4.7.3.6); EN 60950-1 (Sections 4.7.3.1 - 4.7.3.6);

<u>TEST:</u>	<u>TEST METHODS:</u>
Vertical Burning Test (<i>continued</i>)	IEC 60950-1 (Sections 4.7.3.1 - 4.7.3.6); UL 60950-1 (Sections 4.7.3.1 - 4.7.3.6); IEC 60695-11-10; JIS K6911; UL 94 (Section 8); GB/T 5169.16; GB 4943.1, 4.7.3.1-4.7.3.6; BS EN 60695-11-10
Vertical Burning Test using a 125 mm Flame Source	UL 94 (Section 9); IEC 60695-11-20; CAN/CSA C22.2 No.0.17 (Section 5.2.4); ASTM D5048; EN 60950-1, (Sections 4.7.3.1-4.7.3.6); UL 60950-1, (Sections 4.7.3.1-4.7.3.6); CAN/CSA C22.2 60950-1 (Sections 4.7.3.1-4.7.3.6)
Burning Test using a 20 mm Flame Source Used in Electrical Equipment Evaluations	UL 746C (Sections 16 and 51); IEC 60950-1 (Annex A2); EN 60950-1 (Annex A2); UL 60950-1 (Annex A2); CAN/CSA C22.2 No.60950-1 (Annex A2); GB 4943.1, Annex A2
Burning Test using a 127 mm Flame Source Used in Electrical Equipment Evaluations	UL 746C (Sections 17 and 52); IEC 60950-1 (Annex A1); EN 60950-1 (Annex A1); UL 60950-1 (Annex A1); CAN/CSA C22.2 No.60950-1 (Annex A1); GB 4943.1, Annex A1
Burning Test of Automotive Interior Materials	ASTM D5132; FMVSS 302; ISO 3795; JIS D1201; SAE J369; GB 8410; UNECE R118 (Annex 6)
VW-1 Flammability Test	UL224 (Section, 5.12); UL510 (Section 6); UL510a (Section 9, 20); UL1441 (Section 5.7); UL1581 (Section, 1080); UL2556 (Section, 9.4); ASTM D2671 (Section 72 Procedure C); IEC TS 60695-11-21
Flammability Testing for Aircraft Interior Materials (Vertical, Horizontal, 45-Degree, 60 Degree, Flammability Test)	14 CFR 25 (Appendix F, Part 1); CS 25 (Appendix F, Part 1); JAR 25 (Appendix F, Part 1); JCAB AIM Part III (Appendix F, Part 1); RTCA/DO-160G (Section 26); FAA Aircraft Materials Fire Test Handbook Chapter 1; FAA Aircraft Materials Fire Test Handbook Chapter 2; FAA Aircraft Materials Fire Test Handbook Chapter 3; FAA Aircraft Materials Fire Test Handbook Chapter 4



<u>TEST:</u>	<u>TEST METHODS:</u>
Flame Propagation Test	ASTM C1166; ASTM C542; NFPA 130; Title 49 CFR Part 238 Appendix B; FTA Recommended Fire Safety; Practices for Rail Transit Materials Selection
Oxygen Index Measurement	ISO 4589-2; ASTM D2863; JIS K7201-2
Tensile Strength Test	UL 746A (Sections 10-12); CAN/CSA C22.2 No.0.17 (Section 6.7); ISO 527-1, 527-2, 527-3, 527-4, 527-5; JIS K6911, K7127, K7161-1, K7161-2, K7164, K7165
Flexural Strength Test	ASTM D790; UL 746A (Section 16); CAN/CSA C22.2 No.0.17 (Section 6.4); ISO 178; JIS K7171
Tensile Impact Test	ASTM D1822; UL 746A (Section 14); CAN/CSA C22.2 No.0.17 (Section 6.9); ISO 8256; JIS K7160
Izod Impact Test	ASTM D256; UL 746A (Section 13); CSA C22 No.17 (Section 6.3); ISO 180; JIS K7110, JIS K6911 (Section 5.21)
Charpy Impact Test	ASTM D6110; UL746A (Section 15); CSA C22 No.17 (Section 5.2); ISO 179-1; JIS K7111-1, JIS K6911 (Section 5.20)
Burning Test using a Needle Flame Source	UL 746C (Section 15), UL 60950-1, Annex A2.7, UL 1694; GB/T 5169.5; CAN/CSA C22.2 No.0.17 (Section 10.2.1); IEC 60695-11-5, IEC 60335-1 (Section 30 and Annex E), IEC 60950-1, Annex A2.7; EN 60950-1, Annex A2.7; CAN/CSA C22.2 60950-1, Annex A2.7; GB 4943.1, Annex A2.7; IEC 62368-1 Annex S
Horizontal Burning Foamed Material Test	UL 94 (Section 12); CAN/CSA C22.2 No.0.17 (Section 5.2.5), UL 60950-1 (Sections 4.7.3.1 - 4.7.3.6); ASTM D4986; IEC 60950-1 (Sections 4.7.3.1 - 4.7.3.6); EN 60950-1 (Sections 4.7.3.1 - 4.7.3.6); ISO 9772; GB 4943.1, (Sections 4.7.3.1-4.7.3.6)

ELECTRICAL

<u>TEST:</u>	<u>TEST METHODS:</u>
Hot Wire Ignition Test	UL 746A (Section 32); ASTM D3874; CAN/CSA C22.2 No.0.17 (Section 4.3.1)





Accredited Laboratory

A2LA has accredited

CHEMITOX, INC. SHINJYO TESTING CENTER

Yamagata, Japan

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 16th day of February 2023.

A blue ink signature of Mr. Trace McInturff.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1136.08
Valid to January 31, 2025

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



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

CHEMITOX, INC.,
YAMANASHI TESTING CENTER KAI
18349 Egusa, Sutama-cho
Hokuto-shi, Yamanashi-ken 408-0103 Japan
Mr. Yuji Kamiya (Authorized Representative) Phone: 81 551 42 5061
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CALIBRATION

Valid To: July 31, 2024

Certificate Number: 1136.10

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations¹:

I. Chemical

Parameter/Equipment	Range	CMC ² (±)	Comments
Liquid Conductivity Meter	(1 to 100) µS/cm (100 to 1000) µS/cm (1000 to 10 000) µS/cm	2.2 µS/cm 7.5 µS/cm 52 µS/cm	Standard solution, CA-48

II. Dimensional

Parameter/Equipment	Range	CMC ² (±)	Comments
Linear Scale	(50 to 300) mm	0.11 mm	Calipers, CA-1, CA-141
Microscope – Length/Radius/Diameter Angle	Up to 5 mm (10 to 180)°	0.02 mm 0.1°	Reticle, CA-53, CA-26

III. Dimensional Inspection

Parameter/Equipment	Range	CMC ^{2, 4} (\pm)	Comments
One Dimensional – Measure ⁶ Length/Radius/Diameter	(0.5 to 300) mm	0.11 mm	Micrometer, caliper, microscope, loupe; CA-22, CA-26, CA-30, CA-31, CA-33, CA-35, CA-50, CA-54, CA-58, CA-71, CA-74, CA-133, CA-161
Angle – Measure ⁶	(-180 to 180)°	0.5°	Angle gauge, CA-28, CA-29, CA-34, CA-58
	(-180 to 180)°	0.2°	Microscope, CA-35

IV. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2, 5} (\pm)	Comments
Power Supply for Tester	(100 to 240) V (50 to 60) Hz	0.27 V 0.3 Hz	Oscilloscope, CA-91
AC Voltage Stability – Measure	(1 to 10) kV	0.4 % of Applied Voltage	Voltmeter, CA-104

V. Mechanical

Parameter/Equipment	Range	CMC ² (\pm)	Comments
Scales & Balances	(1 to 100) g (100 to 500) g (500 to 3000) g	1.0 g 1.5 g 2.9 g	Weights, CA-49

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Mass	(1 to 100) g (100 to 500) g (500 to 3000) g	1.5 g 2.0 g 5.0 g	Scale, force gauge, CA-39, CA-50
Force – Measure	(0.01 to 2.5) N	0.006 N	Force gauge, CA-146, CA- 150, CA-161

VI. Plastic Industry: Specific Measurements

Parameter/Equipment	Range	CMC ² (±)	Comments
GWIT/GWFI/GWEPT Tester			UL746A, IEC 60695-2-10, IEC 60695-2-11, IEC 60695-2-12, IEC 60695-2- 13, CA-146
Penetration Length	(5 to 10) mm	0.1 mm	Caliper
Thermocouple Type K	(550 to 1000) °C	2.1 °C	Thermocouple
Penetration Force	(0.9 to 1.1) N	0.03 N	Force gauge
Weight	(80 to 120) g	0.2 g	Scale
Time	(50 to 70) s	0.1 s	Stopwatch
Izod, Charpy or Tensile Impact Tester ³			UL746A, ASTM D256, D6110, D1822, ISO 179, 180, 13802 CA-106, CA- 109, CA-130
Angle	Up to 150°	1.1°	Angle gauge
Time	(10 to 70) s	0.2 s	Stopwatch
Mass	(100 to 2000) g	2 g	Scale
Length	(10 to 120) mm	0.1 mm	Caliper

Parameter/Equipment	Range	CMC ² (±)	Comments
Dielectric Strength Tester			UL746A, ASTM D149, IEC 60243-1, JIS C2110, CA-3, CA-22
Output Voltage	Up to 100 kV	1.3 kV	Oscilloscope & voltage probe
Ramp Rate	(20 to 70) s	0.5 s	Stopwatch
Ripple for DC Voltage	Up to 1 kV	0.1 kV	Oscilloscope & voltage probe
Electrode Size	(5 to 80) mm	0.1 mm	Caliper
Comparative Tracking Index (CTI) Tester			UL746A, ASTM D3638, IEC 60112, CA-5
Dripping Interval	(20 to 40) s	0.6s	Stopwatch
Amount of Dripping	(0.3 to 2) g	0.02 g	Scale
Volume of Dripping	(10 to 30) mm ³	0.07 mm ³	
Output Current	Up to 1 A	0.01 A	Ammeter
Short-Circuit Time	(1 to 3) s	0.06 s	
Electrode Force	(80 to 120) gf	1.2 gf	
Electrode Size	(1 to 7) mm	0.01 mm	Micrometer
Block Gauge	(3 to 5) mm	0.01 mm	
HDT/Vicat/Ball Pressure Tester			UL746A, ASTM D648, D1525, ISO 75-1,75-2,306, JIS K7191-1, K71-1-2, K7206, electrical appliance & materials safety law (in Japan 3-31-86), CA-133
Temperature	Room Temperature Up to 300) °C	0.3 °C	Thermocouple
Ramp Rate	2 °C/min	0.05 °C/min	Stopwatch
Digital Indicator	Up to 1 mm	0.002 mm	Micrometer
Span Length	(50 to 120) mm	0.1 mm	Caliper
Edge Size	Up to 6 mm	0.03 mm	Microscope

VII. Thermodynamics

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Thermocouple Type K	Room Temperature Up to 300 °C	0.4 °C	JIS C1602, JIS C5012, CA-68, resistance thermometer
Thermocouple for Thermal Lag Time of Oven	Room Temperature Up to 200 °C	1.8 °C	ASTM D5374, ASTM E220, JIS C1605, IEC 60216-4-1, CA-19, oven
Oven – System Accuracy Test ³	Room Temperature Up to 300 °C	0.8 °C	ASTM D5374, ASTM D5423, JIS C1605, IEC 60216-4-1, CA-121, thermocouple
Thermal Uniformity Survey ³	Room Temperature Up to 300 °C	0.8 °C	ASTM D5374, ASTM D5423, JIS C1605, IEC 60216-4-1, CA-121, thermocouple
Thermal Lag Time ³ (Time Constants)	Up to 1200 s	9.4 s	ASTM D5374, ASTM D5423, JIS C1605, IEC 60216-4-1, CA-121, thermocouple
Rate of Ventilation ³	(5 to 200) air changes/hr	0.8 air changes/hr	ASTM D5374, ASTM D5423, JIS C1605, IEC 60216-4-1, CA-121, power meter
Reflow – Temperature, Measure	Room Temperature Up to 300 °C	0.8 °C	IPC TM-650 2.6.27, CA-99, thermocouple
Temperature/Humidity Controlled Chamber ³	(-40 to 100) °C (10 to 98) % RH	0.5 °C 2 % RH	Thermocouple, thermo-hygrometer, CA-17
Temperature Controlled Chamber ³	(-40 to 100) °C	0.5 °C	Thermocouple, thermo-hygrometer, CA-17

Parameter/Equipment	Range	CMC ^{2, 4} (±)	Comments
Temperature – Measuring Equipment	(-40 to 400) °C	0.5 °C	Thermocouple, resistance thermometer, CA-67
Temperature/Humidity – Measuring Equipment ³	(0 to 60) °C (10 to 98) % RH	0.5 °C 2 % RH	ASTM D618, ISO 291, CA-21, thermocouple, thermo-hygrometer

VIII. Time & Frequency

Parameter/Equipment	Range	CMC ² (±)	Comments
Metronome	Up to 1200 s	0.05 s	Stopwatch, CA-79
Logger Time	Up to 1800 s	0.18 s	Stopwatch, CA-164

¹ This laboratory offers commercial calibration service.

² Calibration and Measurement Capability (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. Calibration and Measurement Capabilities represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

³ Field calibration service is available for this calibration. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found on the Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the actual uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.

⁴ The type of instrument or material being calibrated is defined by the parameter. This indicates the laboratory is capable of calibrating instruments that measure or generate the values in the ranges indicated for the listed measurement parameter.

⁵ The stated measured values are determined using the indicated instrument (see Comments). This capability is suitable for the calibration of the devices intended to measure or generate the measured value in the ranges indicated. CMCs are expressed as either a specific value that covers the full range or as a percent or fraction of the reading plus a fixed floor specification.

⁶This laboratory meets *R205 – Specific Requirements: Calibration Laboratory Accreditation Program* for the types of dimensional tests listed above and is considered equivalent to that of a calibration.



Accredited Laboratory

A2LA has accredited

CHEMITOX, INC., YAMANASHI TESTING CENTER KAI
Yamanashi-ken, JAPAN

for technical competence in the field of

Calibration

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 laboratory also meets R205 – Specific Requirements: Calibration Laboratory Accreditation Program. 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 2022.

A blue ink signature of a person, likely the Vice President of Accreditation Services, written over a horizontal line.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1136.10
Valid to July 31, 2024

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