



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

NSL Analytical Services, Inc.
4450 Cranwood Parkway
Cleveland, OH 44128

Fulfills the requirements of

ISO/IEC 17025:2017

In the field of

TESTING

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

A handwritten signature in black ink, appearing to be 'J. Stine', is positioned above a horizontal line.

Jason Stine, Vice President

Expiry Date: 23 November 2024

Certificate Number: AT-1354



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
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).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

NSL Analytical Services, Inc.

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Cleveland, OH 44128

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TESTING

Valid to: **November 23, 2024**

Certificate Number: **AT-1354**

Chemical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Elemental Analysis	ASTM E1479 ASTM E2371 ASTM E2594 ASTM E3061 ICP-003 ICP-004	All Metal Alloys, Ceramics, Chemicals, Plastics	ICP Avio 500 Optima 5300 Optima 7300
Elemental Analysis	ASTM E2823 MS-003 MS-006	All Metal Alloys, Ceramics, Chemicals, Plastics	ICP-MS NexION 2000B NEXION 300/350X ELAN DRcCe ELAN DRcCeB
Elemental Analysis	ASTM E415 ASTM E1086 ASTM E2994 ASTM E3047 ALY-008 ALY-013	Al, Co, Fe, Ni, Ti Alloys	Spark OES SpectroLab M12 SpectroLab M
Elemental Analysis	ASTM E572 ASTM E1172 ASTM E2465 ALY-010 ALY-010M2	Co, Fe, Ni, Ti Alloys Ceramics	WD-XRF Axios mAX
Elemental Analysis – Semi Quantitative Phase Analysis	ASTM D934 ALY-015	Ceramics	XRD

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Elemental Analysis	NSL-4010	Carbides, Nitrides, Ceramics	DC Arc Atom Comp 2000
Se, Te, Cd	ASTM E1184 ASTM E1834 AA-002	Co, Cr, Fe, Mo, Ni Alloys	AA-GF AAnalyst 600
C Analysis	ASTM E1019 ASTM E1941 ALY-005 ALY-011	Most Metal Alloys, Ceramics	Combustion LECO 844 LECO CS444-LS
H Analysis	ASTM E1447 ALY-006 ALY-012	Metal Alloys, excluding Al, Mg	Inert Gas Fusion LECO H836 LECO RH404
N Analysis	ASTM E1019 ASTM E1409 ALY-002 ALY-003 ALY-014	All Metal Alloys, Oxides, Nitrides, Ceramics	Inert Gas Fusion LECO ON 836 LECO TC436 LECO TC436DR
O Analysis	ASTM E1019 ASTM E1409 ALY-002 ALY-003 ALY-014	Most Metal Alloys (excluding Al), Oxides, Carbides, Nitrides, Ceramics	Inert Gas Fusion LECO ON 836 LECO TC436 LECO TC436DR
S Analysis	ASTM E1019 ALY-005 ALY-011	Most Metal Alloys, Ceramics, Graphite	Combustion LECO 844 LECO CS444LS
Cl, F, Br, I, NO ₂ , NO ₃ , SO ₄ , PO ₄	ASTM D4327 ASTM D7359 BS EN 14582:2016 AC-008	Metal Alloys, Ceramics, Chemicals, Plastics	Ion Chromatography ICS 2100 ICS 5000
Br, Cl, F, I, S ²⁻	ASTM C791 ASTM D512 ASTM D808 ASTM D1179 ASTM D7359 BS EN 14582:2016 AC-002	Metal Alloys, Ceramics, Chemicals, Plastics	Ion-Selective Electrode Orion EA 940

Chemical

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Wet Colorimetric P Wet Colorimetric Cr+6	ISO 3613 AC-006M1 AC-012 WC-001M2	All Metal Alloys, Ceramics, Chemicals, Plastics	UV-Vis GENESYS 5 GENESYS 10S
Wet Gravimetric Ni, Si, P, Cu, Ag, Re, S	ASTM E350 (WC defined) WC-001M5 WC-001M7 WC-001M11 WC-001M18 WC-001M23 WC-001M26	Metal Alloys	Wet Chemistry
Titration Method for Cr Titration Method for B	WC-001M10 (ASTM E350, WC defined) WC-002 WC-001M1 (ASTM E371) WC-001M3 (ASTM C791 - WC defined); WC-002	Metal Alloys, Chemicals	Titration Metrohm 788 Titrand
Wet Chemical Determination of Free Carbon in B4C	AC-017	Powders	Wet Chemistry
Hg Analysis	ASTM D3223 AC-018	Metal Alloys, Ceramics, Chemicals, Plastics	Cold Vapor AA Leeman QuickTrace M-7600
Lead in Children's Products & Jewelry	CPSC-01 CPSC-CH-E1001-08.3 CPSC-CH-E1002-08.3 CPSC-CH-E1003-09.1	Total Pb per 16CFR Part 1303: Lead Paint Regulation Lead in Non-Metal Children's Products Lead in Children's Metal Products Lead in Children's Metal Jewelry	ICP-MS NexION 2000B NexION 300/350X ELAN DRcE ELAN DRcEB ICP-OES Avio 500 Optima 5300 Optima 7300

Chemical

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Soluble Heavy Metals	<p>CPSC-01 ASTM F 963(Section 4 & Section 8)</p> <p>ASTM F 963-16/-17, 4.3.5.1</p> <p>ASTM F 963-16/-17, 4.3.5.2</p> <p>EN 71-3 (section 4 through 10)</p>	<p>Children’s Products Sample Preparation and Analysis</p> <p>Surface Coating Materials – Soluble Test For Metals Toy Substrate Materials</p>	<p>ICP-MS NexION 2000B NexION 300/350X ELAN DRcE ELAN DRcEB</p> <p>ICP-OES PE Avio 500 PE Optima 5300 PE Optima 7300</p> <p>Cold Vapor AA Leeman QuickTrace M-7600</p>
Phthalates	<p>CPSC-CH-C1001-09.3 CPSC-CH-C1001-09.4 (2018)</p> <p>ORG-004 ORG-007 ORG-016</p>	<p>Polymers, Children’s Product Analysis & Other Organic/Inorganic Materials</p>	<p>GC GC-MS Clarus 680 SQ 8T GC-MS Clarus 600 GC LC-MS/MS</p>
Alloy Identification and Qualitative RoHS Screening of Elements	<p>IEC 62321-3-1 ALY-009</p>	<p>Metal Alloys, Ceramics, Plastics</p>	<p>Portable XRF XL3t gun</p>
Quantitative RoHS screening for Halogens, Sulfur, Br	<p>IEC 62321-3-2 ASTM D7359 BS EN 14582 :2016 AC-008 AC-001M2 AC-001M6</p>	<p>Metal Alloys, Ceramics, Plastics</p>	<p>Ion Chromatography ICS 5000 ICS 2100</p>
Mercury in polymers, metals and electronics by CV-AAS, ICP-OES	<p>IEC 62321-4</p>	<p>RoHS Testing: Electronics and Consumer Products (All Metals, Alloys, Ceramics, Chemicals, Plastics, Polymers, Coatings)</p>	<p>ICP-OES Avio 500 Optima 7300 PE Optima 5300 Cold Vapor AA Leeman QuickTrace M-7600</p>

Chemical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Cd, Cr and Pb in Polymers Cd and Pb in Metals Cd, Cr and Pb in Electronics	IEC 62321-5	RoHS Testing: Electronics and Consumer Products (All Metals, Alloys, Ceramics, Chemicals, Plastics, Polymers, Coatings)	ICP-OES Avio 500 Optima 7300 Optima 5300 ICP-MS NexION 2000B NexION 300/350X ELAN DRcCe ELAN DRcCeB
PBB and PBDE in Polymers	IEC 62321-6 ORG-008 ORG-018	RoHS Testing: Electronics and Consumer Products (All Metals, Alloys, Ceramics, Chemicals, Plastics, Polymers, Coatings)	GC-MS Clarus 680 SQ 8T LC-MS
Colorimetric Cr+6 on Surface Coatings	IEC 62321-7-1 AC-012	RoHS Testing: Electronics and Consumer Products (All Metals, Alloys, Ceramics, Chemicals, Plastics, Polymers, Coatings)	UV-Vis Genesys 10S
Colorimetric Cr+6 on Polymers and Electronics	IEC 62321-7-2 AC-012	RoHS Testing: Electronics and Consumer Products (All Metals, Alloys, Ceramics, Chemicals, Plastics, Polymers, Coatings)	UV-Vis Genesys 10S
Phthalates	IEC 62321-8 ORG-007	RoHS Testing: Electronics and Consumer Products (All Metals, Alloys, Ceramics, Chemicals, Plastics, Polymers, Coatings)	GC-MS Clarus 680 SQ 8T
Bisphenol-A (BPA)	ORG-015	Polymers, other Organic/ Inorganic Compounds	LC-MS/MS
Hexabromocyclododecane (HBCDD)	ORG-017	Polymers, other Organic/ Inorganic Compounds	LC-MS/MS

Chemical

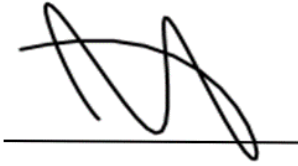
Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
PFAS/PFCA (per- and polyfluoroalkyl & perfluorocarboxylic substances including PFOA/PFOS)	Commission Regulation (EU) 2021/1297 Annex XV11 to Regulation (EC) No 1907/2006 ORG-013 ORG-014	Solids & Liquids	LC-MS/MS
Qualitative Analysis, Polymer Identification	ORG-002	Polymers, other Organic Compounds	FTIR Spectrum 1 & 3
Formulation Identification and Volatile Matter	ASTM E1131 ASTM E1582 ASTM E1860 ASTM E1868 ASTM E2040 ORG-005 ORG-012	Polymers, other Organic Compounds	TGA TA Q500
Determination of Thermal Characteristics	ASTM E967 ASTM E968 ORG-006	Polymers, other Organic Compounds	DSC TA Q20
pH	ASTM D1293 AC-011 WC-005	Aqueous Solutions, Chemicals, Water	pH/Ion Meter
Conductivity & Resistivity	ASTM D1125 AC-010	Aqueous Solutions, Chemicals, Water	Conductivity Meter
% Ash & Moisture	ASTM C561 ASTM C562 PE-001M1	Carbon, Graphite	Muffle Furnace, Balance
Bulk Density by Physical Measurements	ASTM C559 WC-001M34	Carbon, Graphite	Balance, Calipers
Density by Water Displacement	ASTM B311 ISO 3369 WC-001M28	Metals, Ceramics	Balance, Thermometer
Determination of Water by Karl Fischer	ASTM E203 ASTM E1064 ASTM D6304 AC-016	Organic and Inorganic Liquid and Solids	Metrohm Karl Fischer Titrator

Mechanical (Powders)

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Particle Size Distribution by Laser Diffraction	ISO 13320 ASTM B821 ASTM B822 PS-01	Powders	Mastersizer 3000 Particle Size Analyzer
Sieve Analysis	ASTM B214 PC-004	Powders	Rotap Sieves
Flow Rate	ASTM B213 ASTM B964 PC-001	Metal Powders	Hall Flow Meter Carney Funnel
Material Flow Parameters	PC-009	Powders	Revolution Powder Rheometer
BET Surface Area By N ₂ or Kr Adsorption Nitrogen Porosimetry	ASTM B922 ASTM C1274 ISO 9277 ISO 15901-2 PC-006 PC-007 PC-014	Powders, Particles	Quadrascorb evoKr/MP FloVac Degasser
Apparent Density	ASTM B212 ASTM B417 PC-002 PC-003	Free Flowing Metal Powders Non- Free-Flowing Metal Powders	Hall Flowmeter Funnel Carney Funnel
Bulk Density	ASTM D7481 PC-012	Powders	Graduated Cylinder Auto-Tap
Tap Density	ASTM B527 PC-005	Metal Powders	Auto-Tap
Skeletal Volume & Density By Helium or Nitrogen Pycnometry	ASTM B923 ISO12154 MPIF 63 PC-008	Powders Components	Ultrapyc 1200e

Note:

1. This scope is formatted as part of a single document including Certificate of Accreditation No. AT-1354.



Jason Stine, Vice President

