



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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CHEMICAL

Valid To: November 30, 2021

Certificate Number: 1873.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests on tobacco, tobacco smoke, and electronic cigarettes:

**Mainstream (MS) and Sidestream (SS) Smoke Analysis:**

<b><u>Test Description</u></b>	<b><u>Method</u></b>	<b><u>Test Procedure(s)</u></b>
Aflatoxin B1 in Tobacco and MS Smoke by LC-MS/MS	AM-177	-----
Ammonia (MS/SS) by HPLC	AM-011	HC T-101, HC T-201
Benzo(a)pyrene (MS) by HPLC	AM-207	HC T-103
Benzo(a)pyrene (SS) by HPLC	AM-208	HC T-203A
Caffeic Acid in MS Smoke and Tobacco by LC-MS/MS	AM-069	-----
Carbon Monoxide (MS/SS) by NDIR	AM-007	HC T-115, HC T-214, FR11178, FR46483, ISO 8454, CRM No. 68
Carbonyls (MS) by UHPLC with UV Detection Acetaldehyde Acetone Acrolein Butryaldehyde Crotonaldehyde Formaldehyde Methylethylketone Propionaldehyde	AM-254	CRM No. 74
Carbonyls (MS) by UPLC	AM-076	HC T-104
Carbonyls (SS) by HPLC	AM-005	HC T-204
Coumarin in Tobacco and MS Smoke by UHPLC-MS/MS	AM-179	-----
Ethyl Carbamate by GC/MS	AM-175	-----
Eugenol (MS/SS) by HPLC	AM-087	HC T-105

<b><u>Test Description</u></b>	<b><u>Method</u></b>	<b><u>Test Procedure(s)</u></b>
Filter Efficiency (MS) by GC	AM-026	CRM No. 9
Hydrogen Cyanide (MS/SS) by CFA	AM-111	HC T-107, HC T-205
Mercury (MS) by CVAA	AM-036	HC T-108
Mercury (SS) by CVAA	AM-041	HC T-206
Metals (MS) by ICP-MS	AM-021	HC T-109
Metals (SS) by ICP-MS	AM-043	HC T-207
Nicotine, Water, and Menthol (MS) by GC	AM-001	HC T-115, FR11178, FR46483 ISO 10315, ISO 10362-1, ISO 4387, CRM No. 65, No. 66, No. 67
Nicotine in Aqueous Media and Saliva by GC/MS	AM-228	-----
Nicotine in Salt Media by UPLC-MS/MS	AM-242	-----
Nitric Oxide (MS) by Chemiluminescence	AM-216	HC T-110
Nitric Oxide (SS) by Chemiluminescence	AM-217	HC T-208
N-Nitrososarcosine by GC/MS	AM-120	-----
pH (MS) by pH Meter	AM-016	-----
pH (SS) by pH Meter	AM-093	HC T-113
Phenolics (MS) by HPLC	AM-027	HC T-114, CRM No. 78
Phenolics (SS) by HPLC	AM-048	HC T-211
Polycyclic Aromatic Hydrocarbons (MS/SS) by GC/MS	AM-044	HC T-203B
Primary Aromatic Amines (MS/SS) by GC/MS	AM-030	HC T-102, HC T-202
Primary Aromatic Amines (MS) by GC/MS	AM-199	-----
Selected Alkaloids in Tobacco and MS Smoke by GC/MS	AM-100	-----
Semi-Volatiles (MS/SS) by GC/MS	AM-006	HC T-112, HC T-210
Tar and Nicotine (SS) by GC	AM-008	HC T-212
Tobacco Specific N-Nitrosamines (MS) by LC-MS/MS	AM-020	HC T-111B, CRM No. 75, ISO 19290
Tobacco Specific N-Nitrosamines (MS) by GC	AM-210	HC T-111A
Tobacco Specific N-Nitrosamines (SS) by GC	AM-211	HC T-209A
Volatile Organics (MS/SS) by GC/MS	AM-015	HC T-116, HC T-213, CRM No. 70
Volatile Organics I in MS Smoke and Tobacco Products by GC/MS	AM-180	-----
Volatile Organics II in MS Smoke and Tobacco Products by GC/MS	AM-193	-----

**Tobacco:**

<b><u>Test Description</u></b>	<b><u>Method</u></b>	<b><u>Test Procedure(s)</u></b>
Acetamide and Acrylamide by GC/MS	AM-129	-----

<b><u>Test Description</u></b>	<b><u>Method</u></b>	<b><u>Test Procedure(s)</u></b>
Aflatoxin B1 in Tobacco and MS Smoke by LC-MS/MS	AM-177	-----
Ammonia by HPLC	AM-115	HC T-302, CRM No. 79
Anions by HPLC	AM-110	-----
Benzo(a)pyrene by UPLC	AM-125	HC T-307
Caffeic Acid in MS Smoke and Tobacco by LC-MS/MS	AM-069	-----
Carbonyls in Tobacco by UPLC-MS/MS	AM-240	CRM No. 86
CDC Nicotine by GC-FID	AM-072	FR Volume 74, No. 4 CRM No. 62
CDC Oven Volatiles and pH by pH Meter	AM-071	FR Volume 74, No. 4 AOAC 966.02 (Modified)
Coumarin in Tobacco, E-Liquid, and MS Smoke by UHPLC-MS/MS	AM-179	-----
Ethyl Carbamate (Urethane) by GC/MS	AM-174	-----
Eugenol by HPLC	AM-088	HC T-314
Humectants by GC-FID	AM-090	HC T-304
Menthol by GC-FID	AM-070	
Mercury in Tobacco Products and E-Liquids by CVAA	AM-095	HC T-306
Metals by ICP/MS	AM-052	HC T-306
Methyl Salicylate (Wintergreen) and Ethyl Salicylate by GC/MS	AM-078	-----
Minor Alkaloids by GC/MS	AM-100	-----
N-Nitrosodiethanolamine by GC-TEA	AM-172	-----
N-Nitrososarcosine by GC/MS	AM-120	-----
Nicotine by GC/MS	AM-100	CRM No. 87
Nicotine and Minor Alkaloids by GC-NPD	AM-206	HC T-301
Nicotine in Salt Media by UPLC-MS/MS	AM-242	-----
Nitrate by CFA	AM-218	HC T-308
Nitrite by CFA	AM-182	-----
Oven Volatiles by Gravimetric	AM-058	-----
pH by pH Meter	AM-053	HC T-310
Polycyclic Aromatic Hydrocarbons in Tobacco and Tobacco Products by GC/MS	AM-248	-----
Quinoline by GC/MS	AM-243	-----
Reducing Sugars by CFA	AM-074	CRM No. 38
Sodium Propionate by GC/MS	AM-170	-----
Sodium Propionate by GC-FID	AM-089	HC T-312

<u>Test Description</u>	<u>Method</u>	<u>Test Procedure(s)</u>
Sorbic Acid by HPLC	AM-098	HC T-313
Tobacco Specific N-Nitrosamines by LC-MS/MS	AM-031	HC T-309 B, CRM No. 72
Tobacco Specific N-Nitrosamines by GC-TEA	AM-209	HC T-309A
Total Alkaloids by CFA	AM-114	ISO 15152
Total Sugars by CFA	AM-073	CRM No. 38
Total Sugars (as Reducing Sugars) by CFA	AM-113	FR Notice No 66, Volume 71
Triacetin by GC/MS	AM-099	HC T-311
Volatile Organics I in MS Smoke and Tobacco Products by GC/MS	AM-180	-----
Volatile Organics II in MS Smoke and Tobacco Products by GC/MS	AM-193	-----
Water Activity in Smokeless Tobacco and E-Liquid	AM-233	-----

**Electronic Cigarettes:**

<u>Test Description</u>	<u>Method</u>	<u>Test Procedure(s)</u>
Amides in E-Liquids by GC/MS	AM-245	-----
Ammonia in Aerosol and E-Liquid by HPLC with Non-Suppressed Conductivity Detection	AM-250	-----
Carbonyls in E-Cigarette Aerosol by HPLC-UV	AM-236	-----
Carbonyls in E-Liquid and Aerosol by LC-MS/MS	AM-244	-----
Carbonyls in Heated Tobacco Product Aerosol by LC-MS/MS	AM-262	-----
E-Vapor Condensate Collection and Characterization by GC-FID and GC-TCD	AM-224	-----
Glycidol in ENDS Aerosol by GC/MS	AM-274	-----
Mercury in ENDS Aerosol by Cold Vapor Atomic Absorption (CVAA)	AM-251	-----
Mercury in Tobacco Products and E-Liquids by CVAA	AM-095	-----
Metals in ENDS Aerosol by ICP-MS	AM-249	-----
N-Nitrosodiethanolamine by GC-TEA	AM-172	-----
N-Nitrososarcosine by GC/MS	AM-120	-----
Nicotine Degradants in E-Liquid and E-Cigarette Aerosol by LC/MS	AM-238	-----
Nicotine, Menthol, Humectants and Contaminants in E-Cigarette Aerosol and E-Liquid by GC-FID	AM-201	CRM No. 84
NO/NOX by Chemiluminescence Detector	AM-216	HC T-110
pH in Smoke and E-Cigarette Aerosol	AM-237	-----

<u>Test Description</u>	<u>Method</u>	<u>Test Procedure(s)</u>
pH of E-Liquid	AM-232	-----
Selected Metals in E-Liquid and Trapped Aerosol by ICP/MS	AM-235	-----
Selected Primary Aromatic Amines (PAAs) in E-Cigarette Aerosol and E-Liquid by GC/MS	AM-221	-----
Tobacco Specific N-Nitrosamines in E-Liquid by LC-MS/MS	AM-225	-----
Tobacco-Specific N-Nitrosamines (TSNAs) in E-Cigarette Vapor by LC-MS/MS	AM-220	-----
Triacetin by GC/MS	AM-099	HC T-311
Water in E-Liquid by GC-TCD	AM-222	-----

### MECHANICAL

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests on tobacco, tobacco smoke, and electronic cigarettes:

<u>Test Description</u>	<u>Method</u>	<u>Test Procedure(s)</u>
Ignition Propensity	AM-050	ASTM 2187-04, ASTM 2187-09, ISO 12863:2010
Physical Properties:	AM-009	-----
Circumference	AM-009	-----
Diameter	AM-009	ISO 2971
Length (Cigar, Cigarette, Tipping, Filter, Column, Vent)	AM-009	-----
Permeability	AM-009	ISO 2965
Pressure Drop	AM-009	ISO 6565
Tobacco Weight	AM-009	-----
Ventilation	AM-009	ISO 9512
Weight of Cigars/Cigarettes per Thousand	AM-186	-----
Smoke Collection	SOP EQU-037	HC T-115, FR11178, FR45483, ISO 20778, ISO 3308, ISO 3402, ISO 4387, CRM No. 64

**Key:**

CRM = CORESTA Recommended Method

FR = Federal Register

HC = Health Canada

ISO = International Standards Organization



## Accredited Laboratory

A2LA has accredited

### ENTHALPY ANALYTICAL, INC.

Richmond, VA

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 17<sup>th</sup> day of December 2019.

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

Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 1873.01  
Valid to November 30, 2021  
Revised January 22, 2020

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