

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK



10636

Accredited to
ISO/IEC 17025: 2017

Broughton Life Sciences Limited

Issue No: 012 Issue date: 13 January 2025

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Testing performed at the above address only

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/Equipment/Techniques used
Alternative Tobacco Products	<u>Organic contaminants and constituents (naturally occurring and process related contaminants and constituents)</u>	Management of Flexible scope and development of validated methods in accordance with NCP_SOP_170 using single laboratory validation protocol for the techniques combinations: <ul style="list-style-type: none">• Gas Chromatography• (HP) Liquid Chromatography• Refractive Index• Mass Spectrometry• Mass Spectrometry/ Mass Spectrometry• Flame Ionisation Detection• Ultra Violet
SMOKELESS NICOTINE DELIVERY PRODUCTS (ecigarettes, electronic cigarettes, vaping devices)	<u>Chemical Tests</u>	Documented In-House Methods based on industry standard methods (solvent extraction and aerosol collection only based on ISO 20768:2018)
Electronic cigarette liquid and Smokeless nicotine delivery vapour / aerosol	Nicotine Menthol Glycerol Propylene Glycol Diethylene Glycol Ethylene Glycol Glycidol 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK) N'-Nitrosonornicotine (NNN)	NTM0001 - based on ISO 20768:2018 and gas chromatography flame ionisation detection (GC-FID) NTM0115 - based on ISO 20768:2018 using liquid chromatography tandem mass spectrometry (LC-MS/MS)



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SMOKELESS NICOTINE DELIVERY PRODUCTS (ecigarettes, electronic cigarettes, vaping devices) (cont'd) Electronic cigarette liquid and Smokeless nicotine delivery vapour / aerosol (cont'd)	<u>Chemical Tests</u> (cont'd) 1,3-Butadiene Isoprene Acrylonitrile Benzene Propylene Oxide Toluene Nicotine n-oxide Cotinine Nornicotine Anatabine Myosmine Anabasine beta-Nicotyrine Acetaldehyde Formaldehyde Crotonaldehyde Acrolein Propionaldehyde Butyraldehyde Methyl Ethyl Ketone (2-Butanone) Diacetyl Acetyl Propionyl Furfural Benzaldehyde Cinnemaldehyde Vanillin pH	NTM0012 - based on ISO 20768:2018 and gas chromatography-mass spectrometry (GC-MS) NTM0016 - based on ISO 20768:2018 using liquid chromatography mass spectrometry NTM0025a - based on ISO 20768:2018 and liquid chromatography-mass spectrometry (LC-MS). NTM0025b - based on ISO 20768:2018 and liquid chromatography-mass spectrometry (LC-MS) NTM0025c - based on ISO 20768:2018 and liquid chromatography-mass spectrometry (LC-MS) NTM0025d - based on ISO 20768:2018 and liquid chromatography tandem mass spectrometry (LC-MS/MS) NTM0027 - based on ISO 20768:2018 and European Pharmacopoeia monograph, Ph. Eur. 2.2.3 Potentiometric Determination of pH



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SMOKELESS NICOTINE DELIVERY PRODUCTS (ecigarettes, electronic cigarettes, vaping devices) (cont'd)	<p><u>Chemical Tests</u> (cont'd)</p> <p>1-Butanol Benzyl Acetate Ethyl Acetate Ethyl Acetoacetate Isoamyl Acetate Isobutyl Acetate Methyl Acetate</p> <p>Propionic acid</p> <p>Benzoic acid</p> <p>Arsenic Cadmium Chromium Copper Nickel Lead Tin Zinc Iron Silver Aluminium Vanadium Cobalt Molybdenum Antimony Mercury</p> <p>Gold</p>	<p>Documented In-House Methods based on industry standard methods (solvent extraction and aerosol collection only based on ISO 20768:2018)</p> <p>NTM0037 - based on ISO 20768:2018 and headspace gas chromatography-mass spectrometry (GC-MS)</p> <p>1. NTM0038 - based on ISO 20768:2018 and ion chromatography (IC)</p> <p>2. NTM0057 - based on ISO 20768:2018 and liquid chromatography-ultraviolet (HPLC-UV)</p> <p>NTM0063 by Ion Chromatography</p> <p>NTM0004 - based on ISO 20768:2018 and inductively coupled plasma mass spectrometry (ICP-MS).</p> <p>NTM0065 - based on ISO 20768:2018 and inductively coupled plasma mass spectrometry (ICP-MS).</p> <p>NTM0065 - based on ISO 20768:2018 and inductively coupled plasma mass spectrometry (ICP-MS).</p>



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SMOKELESS NICOTINE DELIVERY PRODUCTS (ecigarettes, electronic cigarettes, vaping devices) (cont'd)	<u>Chemical Tests</u> (cont'd)	Documented In-House Methods based on industry standard methods (solvent extraction and aerosol collection only based on ISO 20768:2018)
Smokeless nicotine delivery vapour / aerosol	Nicotine	TM1111 - based on ISO20768:2018 and liquid chromatography-ultraviolet (HPLC-UV)
Electronic cigarette liquid	Nicotine	TM1116 - Determination of Nicotine assay in E-Liquid by liquid chromatography-ultraviolet (HPLC-UV)
SMOKELESS NICOTINE DELIVERY PRODUCTS (ecigarettes, electronic cigarettes, vaping devices)	<u>Physical Tests</u>	Documented In-House Methods based on industry standard methods (solvent extraction and aerosol collection only based on ISO 20768:2018)
Electronic cigarette liquid	Density Relative Density Specific Gravity	NTM0019 - at 20°C based on British Pharmacopoeia Monograph, Appendix V G
	Viscosity	NTM0023 at 25°C by Rotational Rheometer
	Mass loss during storage	NTM0041 - Determination of Mass Loss During Storage of Samples using analytical balances
	Boiling point	NTM0051 - Determination of Boiling Point of E-Liquids using Mettler Toledo MP80 Instrument
	Water content	TM1051 - Determination of Water Content by Karl Fischer. In-house method based on European Pharmacopoeia Ph. Eur. 2.5.12/British Pharmacopoeia Monograph Water Content by Karl Fischer titration



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Electronic cigarette liquid (cont'd)	Density	TM1145 – based on British Pharmacopoeia Monograph, Appendix V G at 20°C by a Density Meter
	<u>Chemical Tests</u>	Documented In-House Methods based on industry standard methods (solvent extraction and aerosol collection only based on ISO 20768:2018)
	Refractive Index	TM1146 - Determination of Refractive Index at 20°C by optical refractometry. In-house method based on European Pharmacopoeia monograph, Ph. Eur. 2.2.6 Determination of Refractive Index.
Smokeless nicotine delivery vapour/aerosol	Particle size	TM1309 - Particle Size Determination based on European Pharmacopoeia Ph. Eur. 2.9.31/British Pharmacopoeia Monograph Laser Diffraction.
Modern Oral Tobaccoless Pouches	Water Content	NTM0081 – Determination of Water Content based on British Pharmacopoeia method for water 2.5.12/Karl Fischer Titration



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SMOKELESS NICOTINE DELIVERY PRODUCTS (ecigarettes, electronic cigarettes, vaping devices) (cont'd) Modern Oral Tobaccoless Pouches (cont'd)	<p><u>Chemical Tests</u> (cont'd)</p> <p>Metals: Ag, Silver Al, Aluminium As, Arsenic Cd, Cadmium Co, Cobalt Cr, Chromium Hg, Mercury Mo, Molybdenum Ni, Nickel Pb, Lead Sb, Antimony Sn, Tin V, Vanadium Zn, Zinc</p> <p>Carbonyls: Acetaldehyde Acrolein AP Butyraldehyde Crotonaldehyde DA Formaldehyde MEK/methyl ethyl ketone/butanone Propionaldehyde</p> <p>Diketones: Diacetyl Acetyl Propionyl</p> <p>Nicotine</p> <p>4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNK) N'-Nitrosonornicotine (NNN) (S)-N-Nitrosoanabasine (NAB) (S)-N-Nitrosoanatabine (NAT)</p> <p>Dissolution of Nicotine</p>	<p>Documented In House Methods</p> <p>NTM0082 – Determination of metals by ICP-MS</p> <p>NTM0083a – Determination of Carbonyls by HPLC-MS</p> <p>NTM0083b – Determination of Diketones by HPLC-MS</p> <p>NTM0084 – Determination of Nicotine Assay by HPLC-UV</p> <p>NTM0115 Determination of tobacco specific nitrosamines by LC-MS/MS</p> <p>NTM0086 - USP-4 Dissolution Apparatus by HPLC-UV</p>



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Modern Oral Tobaccoless Pouches (cont'd)	Freebase Nicotine Nicotine n-oxide Cotinine Nornicotine Anatabine Myosmine Anabasine beta-Nicotyrine <u>Physical Tests</u> pH Water Activity (25°C) Loss on drying	NTM0088 - Determination of Freebase Nicotine using pH meter and Henderson-Hasselbalch Equation NTM0097 - Determination of Nicotine Related Substances by LC-MS/MS Documented In House Methods: NTM0098 – Determination of pH European Pharmacopeia Method 2.2.3 Potentiometric Determination of pH using pH meter NTM0087 – Determination of Water Activity at 25°C by Water Activity Meter NTM0099 – Determination of Loss on drying based on European Pharmacopeia Method 2.2.32
Alternative Tobacco Products	Weight Length and Diameter	NTM0120 – by analytical balance NTM0119 – by callipers
Disposable Electronic Nicotine Delivery Systems and E-liquid Pods	Fill weight and Fill volume	NTM0106 – by analytical balance and density meter



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SMOKELESS NICOTINE DELIVERY PRODUCTS (ecigarettes, electronic cigarettes, vaping devices) (cont'd)	<u>Chemical Tests</u>	Documented In House Methods
E-liquids and Aerosols	Cannabinoids: Cannabichromenic acid (CBCA) Cannabidolic acid (CBDA) Cannabivaranic acid (CBDVA) Cannbigerolic acid (CBGA) Cannabinolic acid (CBNA) Tetrahydrocannabinolic acid (THCA-A) Tetrahydrocannabicanic acid (THCVA) Cannabichromene (CBC) Cannabicyclol (CBL) Cannabidiol (CBD) Cannabidivarain (CBDV) Cannabigerol (CBG) Cannabinol (CBN) d8-tetrahydrocannabinol (d8-THC) d9-tetrahydrocannabinol (d9-THC) Tetrahydrocannabicanin (THCV)	NTM0100 – by HPLC MS/MS
Heated Tobacco Products	Tobacco Specific Nitrosamines (TSNAs) Carbonyls PG, VG, Menthol, Nicotine and Triacetin Acetamide and Acrylamide Nitric oxide and nitrogen oxides Total Particulate Matter (TPM) and Carbon Monoxide	NTM0115 – by LC-MS/MS NTM0112 – by LC-MS NTM0113 – by GC-FID NTM0114 – by HPLC-MS/MS NTM0116 – by chemiluminescence NTM0118 – using Horiba VA500 CO Analyser



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OILS AND TINCTURES	<u>Chemical Tests</u> Cannabinoids: Cannabichromenic acid (CBCA) Cannabidolic acid (CBDA) Cannabivarinic acid (CBDVA) Cannabigerolic acid (CBGA) Cannabinolic acid (CBNA) Tetrahydrocannabinolic acid (THCA-A) Tetrahydrocannabicanic acid (THCVA) Cannabichromene (CBC) Cannabicyclol (CBL) Cannabidiol (CBD) Cannabidivarin (CBDV) Cannabigerol (CBG) Cannabinol (CBN) d8-Tetrahydrocannabinol (d8-THC) d9- Tetrahydrocannabinol (d9-THC) Tetrahydrocannabicanin (THCV)	Documented In House Methods NTM0121 – by HPLC-MS/MS
END		