


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 <p>UKAS TESTING</p> <p>10636</p> <p>Accredited to ISO/IEC 17025: 2017</p>	<p>Broughton Life Sciences Limited</p> <p>Issue No: 009 Issue date: 27 August 2024</p>	
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<p>Testing performed at the above address only</p>		

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 (cigarettes, 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'-Nitrosornicotine (NNN)	NTM0001 - based on ISO 20768:2018 and gas chromatography flame ionisation detection (GC-FID) NTM0008 -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)	<u>Chemical Tests</u> (cont'd)	
Electronic cigarette liquid and Smokeless nicotine delivery vapour / aerosol (cont'd)	1,3-Butadiene Isoprene Acrylonitrile Benzene Propylene Oxide Toluene	NTM0012 - based on ISO 20768:2018 and gas chromatography-mass spectrometry (GC-MS)
	Nicotine n-oxide Cotinine Nornicotine Anatabine Myosmine Anabasine beta-Nicotyrine	NTM0016 - based on ISO 20768:2018 using liquid chromatography mass spectrometry
	Acetaldehyde Formaldehyde Crotonaldehyde Acrolein Propionaldehyde Butyraldehyde Methyl Ethyl Ketone (2-Butanone)	NTM0025a - based on ISO 20768:2018 and liquid chromatography-mass spectrometry (LC-MS).
	Diacetyl Acetyl Propionyl	NTM0025b - based on ISO 20768:2018 and liquid chromatography-mass spectrometry (LC-MS)
	Furfural	NTM0025c - based on ISO 20768:2018 and liquid chromatography-mass spectrometry (LC-MS)
	Benzaldehyde Cinnamaldehyde Vanillin	NTM0025d - based on ISO 20768:2018 and liquid chromatography tandem mass spectrometry (LC-MS/MS)
	pH	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)	<u>Chemical Tests</u> (cont'd) 1-Butanol Benzyl Acetate Ethyl Acetate Ethyl Acetoacetate Isoamyl Acetate Isobutyl Acetate Methyl Acetate Propionic acid Benzoic acid Arsenic Cadmium Chromium Copper Nickel Lead Tin Zinc Iron Silver Aluminium Vanadium Cobalt Molybdneum Antimony Mercury Gold	Documented In-House Methods based on industry standard methods (solvent extraction and aerosol collection only based on ISO 20768:2018) NTM0037 - based on ISO 20768:2018 and headspace gas chromatography-mass spectrometry (GC-MS) 1. NTM0038 - based on ISO 20768:2018 and ion chromatography (IC) 2. NTM0057 - based on ISO 20768:2018 and liquid chromatography-ultraviolet (HPLC-UV) NTM0063 by Ion Chromatography NTM0004 - based on ISO 20768:2018 and inductively coupled plasma mass spectrometry (ICP-MS). NTM0065 - based on ISO 20768:2018 and inductively coupled plasma mass spectrometry (ICP-MS). NTM0065 - based on ISO 20768:2018 and inductively coupled plasma mass spectrometry (ICP-MS).



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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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Modern Oral Tobaccolless Pouches (cont'd)	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	NTM0082 – Determination of metals by ICP-MS
	Carbonyls: Acetaldehyde Acrolein AP Butryaldehyde Crotonaldehyde DA Formaldehyde MEK/methyl ethyl ketone/butanone Propionaldehyde	NTM0083a – Determination of Carbonyls by HPLC-MS
	Diketones: Diacetyl Acetyl Propionyl	NTM0083b – Determination of Diketones by HPLC-MS
	Nicotine	NTM0084 – Determination of Nicotine Assay by HPLC-UV
	4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK) N'-Nitrosoanabasine (NAB) (S)-N-Nitrosoanabasine (NAB) (S)-N-Nitrosoanatabine (NAT)	NTM0085 Determination of tobacco specific nitrosamines by HPLC-MS/MS
	Dissolution of Nicotine	NTM0086 - USP-4 Dissolution Apparatus by HPLC-UV



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Modern Oral Tobaccoless Pouches (cont'd)	Freebase Nicotine	NTM0088 - Determination of Freebase Nicotine using pH meter and Henderson-Hasselbalch Equation
	Nicotine n-oxide Cotinine Nor nicotine Anatabine Myosmine Anabasine beta-Nicotyrine	NTM0097 - Determination of Nicotine Related Substances by LC-MS/MS
	<u>Physical Tests</u>	Documented In House Methods:
	pH	NTM0098 – Determination of pH European Pharmacopeia Method 2.2.3 Potentiometric Determination of pH using pH meter
	Water Activity (25°C)	NTM0087 – Determination of Water Activity at 25°C by Water Activity Meter
	Loss on drying	NTM0099 – Determination of Loss on drying based on European Pharmacopeia Method 2.2.32
Alternative Tobacco Products	Weight	NTM0120 – by analytical balance
	Length and Diameter	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) Cannabidiolic acid (CBDA) Cannabivaranic acid (CBDVA) Cannbigerolic acid (CBGA) Cannabinolic acid (CBNA) Tetrahydrocannabinolic acid (THCA-A) Tetrahydrocannabicarinic acid (THCVA) Cannabichromene (CBC) Cannabicyclol (CBL) Cannabidiol (CBD) Cannabidivarin (CBDV) Cannabigerol (CBG) Cannabinol (CBN) d8-tetrahydrocannabinol (d8-THC) d9-tetrahydrocannabinol (d9-THC) Tetrahydrocannabicarin (THCV)	NTM0100 – by HPLC MS/MS
Heated Tobacco Products	PG and VG	NTM0110 – by HPLC-RI
	Tobacco Specific Nitrosamines (TSNAs)	NTM0115 – by LC-MS/MS
	Carbonyls	NTM0112 – by LC-MS
	PG, VG, Menthol, Nicotine and Triacetin	NTM0113 – by GC-FID
	VG	NTM0125 – by HPLC-RI
	Acetamide and Acrylamide	NTM0114 – by HPLC-MS/MS
	Nitric oxide and nitrogen oxides	NTM0116 – by chemiluminescence
	Total Particulate Matter (TPM) and Carbon Monoxide	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) Tetrahydrocannabicarinic acid (THCVA) Cannabichromene (CBC) Cannabicyclol (CBL) Cannabidiol (CBD) Cannabidivarin (CBDV) Cannabigerol (CBG) Cannabinol (CBN) d8-Tetrahydrocannabinol (d8-THC) d9- Tetrahydrocannabinol (d9-THC) Tetrahydrocannabicarin (THCV)	Documented In House Methods NTM0121 – by HPLC-MS/MS
END		