


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 <p>10636</p> <p>Accredited to ISO/IEC 17025: 2017</p>	<p>Broughton Life Sciences Limited</p> <p>Issue No: 004 Issue date: 29 October 2021</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
<p>SMOKELESS NICOTINE DELIVERY PRODUCTS (ecigarettes, electronic cigarettes, vaping devices)</p> <p>Electronic cigarette liquid and Smokeless nicotine delivery vapour / aerosol</p>	<p><u>Chemical Tests</u></p> <p>Nicotine Menthol Glycerol Propylene Glycol Diethylene Glycol Ethylene Glycol Glycidol</p> <p>4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK) N'-Nitrosornnicotine (NNN)</p> <p>1,3-Butadiene Isoprene Acrylonitrile Benzene Propylene Oxide Toluene</p> <p>Nicotine n-oxide Cotinine Nornicotine Anatabine Myosmine Anabasine beta-Nicotyrine</p>	<p>Documented In-House Methods based on industry standard methods (solvent extraction and aerosol collection only based on ISO 20768:2018)</p> <p>NTM0001 - based on ISO 20768:2018 and gas chromatography flame ionisation detection (GC-FID)</p> <p>NTM0008 -based on ISO 20768:2018 using liquid chromatography tandem mass spectrometry (LC-MS/MS)</p> <p>NTM0012 - based on ISO 20768:2018 and gas chromatography-mass spectrometry (GC-MS)</p> <p>NTM0016 - based on ISO 20768:2018 using liquid chromatography mass spectrometry</p>



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SMOKELESS NICOTINE DELIVERY PRODUCTS (ecigarettes, electronic cigarettes, vaping devices)	<p><u>Chemical Tests</u></p> <p>Acetaldehyde Formaldehyde Crotonaldehyde Acrolein Propionaldehyde Butyraldehyde Methyl Ethyl Ketone (2-Butanone)</p> <p>Diacetyl Acetyl Propionyl</p> <p>Furfural</p> <p>Benzaldehyde Cinnamaldehyde Vanillin</p> <p>pH</p> <p>1-Butanol Benzyl Acetate Ethyl Acetate Ethyl Acetoacetate Isoamyl Acetate Isobutyl Acetate Methyl Acetate</p>	<p>Documented In-House Methods based on industry standard methods (solvent extraction and aerosol collection only based on ISO 20768:2018)</p> <p>NTM0025a - based on ISO 20768:2018 and liquid chromatography-mass spectrometry (LC-MS).</p> <p>NTM0025b - based on ISO 20768:2018 and liquid chromatography-mass spectrometry (LC-MS)</p> <p>NTM0025c - based on ISO 20768:2018 and liquid chromatography-mass spectrometry (LC-MS)</p> <p>NTM0025d - based on ISO 20768:2018 and liquid chromatography tandem mass spectrometry (LC-MS/MS)</p> <p>NTM0027 - based on ISO 20768:2018 and European Pharmacopoeia monograph, Ph. Eur. 2.2.3 Potentiometric Determination of pH</p> <p>NTM0037 - based on ISO 20768:2018 and headspace gas chromatography-mass spectrometry (GC-MS)</p>



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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)
	Propionic acid	1. NTM0038 - based on ISO 20768:2018 and ion chromatography (IC) 2. NTM0057 - based on ISO 20768:2018 and liquid chromatography-ultraviolet (HPLC-UV)
	Benzoic acid	NTM0063 by Ion Chromatography
	Arsenic Cadmium Chromium Copper Nickel Lead Tin Zinc Iron Silver Aluminium Vanadium Cobalt Molybdneum Antimony Mercury	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).
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)



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<p>SMOKELESS NICOTINE DELIVERY PRODUCTS (ecigarettes, electronic cigarettes, vaping devices)</p> <p>Electronic cigarette liquid</p>	<p><u>Physical Tests</u></p> <p>Density Relative Density Specific Gravity</p> <p>Viscosity</p> <p>Mass loss during storage</p> <p>Boiling point</p> <p>Water content</p> <p>Density</p>	<p>Documented In-House Methods based on industry standard methods (solvent extraction and aerosol collection only based on ISO 20768:2018)</p> <p>NTM0019 - at 20°C based on British Pharmacopoeia Monograph, Appendix V G</p> <p>NTM0023 at 25°C by Rotational Rheometer</p> <p>NTM0041 - Determination of Mass Loss During Storage of Samples using analytical balances</p> <p>NTM0051 - Determination of Boiling Point of E-Liquids using Mettler Toledo MP80 Instrument</p> <p>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</p> <p>TM1145 – based on British Pharmacopoeia Monograph, Appendix V G at 20°C by a Density Meter</p>



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SMOKELESS NICOTINE DELIVERY PRODUCTS (ecigarettes, electronic cigarettes, vaping devices) Smokeless nicotine delivery vapour/aerosol	<u>Chemical Tests</u> Refractive Index Particle size	Documented In-House Methods based on industry standard methods (solvent extraction and aerosol collection only based on ISO 20768:2018) 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. TM1309 - Particle Size Determination based on European Pharmacopoeia Ph. Eur. 2.9.31/British Pharmacopoeia Monograph Laser Diffraction.
Modern Oral Tobaccoless Pouches	Water Content 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	In -House methods: NTM0081 – Determination of Water Content based on British Pharmacopoeia method for water 2.5.12/Karl Fischer Titration NTM0082 – Determination of metals by ICP-MS



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Modern Oral Tobaccoless Pouches (Continued)	<p><u>Chemical Tests</u></p> <p>Carbonyls: Acetaldehyde Acrolein AP Butryaldehyde Crotonaldehyde DA Formaldehyde MEK/methyl ethyl ketone/butanone Propionaldehyde</p> <p>Diketones: Diacetyk Acetyk Propionyl</p> <p>Nicotine</p> <p>4-(methylnitrosamino)-1-(3-pyridyl)- 1-butanone (NNK) N'-Nitrosornicotine (NNN) (S)-N-Nitrosoanabasine (NAB) (S)-N-Nitrosoanatabine (NAT)</p> <p>Dissolution of Nicotine</p> <p>Freebase Nicotine</p> <p>Nicotine n-oxide Cotinine Nornicotine Anatabine Myosmine Anabasine beta-Nicotyrine</p>	<p>In -House methods:</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>NTM0085 Determination of tobacco specific nitrosamines by HPLC-MS/MS</p> <p>NTM0086 - USP-4 Dissolution Apparatus by HPLC-UV</p> <p>NTM0088 - Determination of Freebase Nicotine using pH meter and Henderson-Hasselbalch Equation</p> <p>NTM0097 - Determination of Nicotine Related Substances by LC-MS/MS</p>



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Modern Oral Tobaccoless Pouches (Cont'd)	<u>Physical Tests</u> pH Water Activity (25°C) Water Content Loss on drying	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 NTM0081 – Determination of Water Content based on British Pharmacopoeia method for water 2.5.12/Karl Fischer Titration NTM0099 – Determination of Loss on drying based on European Pharmacopeia Method 2.2.32
END		