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

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Forensic Science Northern Ireland

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151 Belfast Road
Carrickfergus
Co Antrim
Northern Ireland
BT38 8PL

Contact: Quality Manager
Tel: +44 (0)28 9036 1888
Fax : +44 (0)28 9036 1900
E-Mail: generalenquiries@fsni.gsi.gov.uk
Website: www.fsni.gov.uk

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
BODY FLUIDS and TISSUES Blood - Whole - Stains Semen - Whole - Azoospermic Saliva - Whole - Stains Hair Cellular Material	<u>Forensic Analysis</u> DNA Profiling: Short Tandem Repeat (STR) for forensic analysis of: - Subject Samples (CJ and Volunteer) meeting the requirements of the Custodian for the Purpose of Supply to the National DNA Database - Crime Scene Samples meeting the requirements of the Custodian for the Purpose of Supply to the National DNA Database	Documented In-House Methods using manual extraction - Qiagen Kits Documented In-House Methods using Manual quantification - Quantiplex Pro - Quantiplex HYres - Real Time Documented In-House Methods using Manual amplification (PCR) and the following chemistry: - NGM SElect - ESI 17 Documented In-House Methods using Electrophoresis - Applied Biosystems 3130/3130xl Genetic Analyser© - 3500xl Genetic Analyser©
Saliva - FTA cards - Swabs (buccal cells)	DNA Profiling: Short Tandem Repeat (STR) for forensic analysis of: - Subject Samples (CJ and Volunteer) meeting the requirements of the Custodian for the Purpose of Supply to the National DNA Database	Documented In-House Methods using Direct amplification (PCR) and the following chemistry: - NGM SElect Express - ESI 17 Fast Documented In-House Methods using Electrophoresis - Applied Biosystems 3130/3130xl Genetic Analyser© - 3500xl Genetic Analyser©

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
BODY FLUIDS and TISSUES (cont'd)	<u>Related Opinions and Interpretation</u> Interpretation of DNA profiles generated internally from crime stains (single source/major-minor/complex mixtures) and reference samples Statistical analysis and comparison of DNA profiles generated from crime stains with compatible reference DNA profiles (internally generated or from other accredited laboratories) <u>Forensic Analysis</u> (cont'd)	Documented In-House methods - Genetic Characterisation • GMID 3.2.1 • Genemapper IdX • Expert Systems ○ STRMix (v2.5)
Any Material	Searching for: - Blood - Semen - Saliva - Hair Recovery and preparation, including for contingency purposes, for subsequent DNA analysis by an ISO/IEC 17025 accredited laboratory of the following from searched materials: - Blood - Semen - Saliva - Cellular DNA - Hair	Documented In-House Methods using: - visual examination - low power microscopy - high power microscopy - chemical testing (see below) Documented In-House Methods using: - cutting - swabs and swabbing - extraction of stained materials - extraction of swabs - taping - mini-taping
Blood	Presumptive testing for Blood via detection of: - Peroxidase <u>Related Opinions and Interpretations</u> Identification, interpretation and recording of blood patterns (BPA) on clothing and other items examined at the laboratory	Documented In-House Methods using: - Visual Examination - KM (Kastle Meyer) Documented In-House Methods (TP-4062) using : - visual examination - low power microscopy - dimensional measurement

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
BODY FLUIDS and TISSUES (cont'd)	Forensic Analysis (cont'd)	
Semen	Presumptive testing for seminal fluid, via detection of: - Acid Phosphatase - Choline	Documented In-House Methods using: - Visual Examination - Acid phosphatase detection (colour reaction) - Choline detection by Florence Iodine test
	Confirmatory testing for seminal fluid via identification of: Spermatozoa	Documented In-House Methods using: - High power microscopy - Haematoxylin and Eosin staining - Christmas tree Stains
Saliva	Presumptive testing for saliva via detection of: - Amylase	Documented In-House Methods using: - Visual examination - Phadebas paper - Phadebas tube test
Blood and Urine	Detection and quantification of alcohol in relation to the Northern Ireland Road Traffic Act (20 - 200 mg%)	Documented In-House Method (TP1013) using Headspace GC/FID analysis including the Clarus 500 system
Blood (Preserved, Unpreserved) Urine (Preserved, Unpreserved)	Presumptive screening for the presence of drugs Drug types/groups : - Methylethylcathinones - Fluoromethacathinones - ephedrine/pseudoephedrine	Documented in house method (TP1240) using : - UPLC-HRMS

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
BODY FLUIDS and TISSUES (cont'd)	Forensic Analysis (cont'd)	
Blood (Preserved, Unpreserved) Urine (Preserved, Unpreserved (cont'd)	Confirmation of drugs :	Documented in house method (TP1240) using :
	Opiods group : - Morphine - Dihydrocodeine - Codeine - Oxycodone - 6 – MAM - Methadone - Tramadol - Buprenorphine - Fentanyl	- UPLC-HRMS
	Antidepressant group: - Trazodone - Mirtazepine - Dothiepin - Imipramine - Amitriptyline - Nortriptyline - Clomipramine - Citalopram - Venlafaxine - Paroxetine - Duloxetine - Fluoxetine - Sertraline	- UPLC-HRMS

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
BODY FLUIDS and TISSUES (cont'd) Blood (Preserved, Unpreserved) Urine (Preserved, Unpreserved (cont'd)	<u>Forensic Analysis</u> (cont'd) Confirmation of drugs (cont'd) Benzodiazepines and "z" groups: - 7 –Aminoclonazepam - 7 –Aminoflunitrazepam - 7 – Aminonitrazepam - Flurazepam - Midazolam - Clonazepam - Flunitrazepam - Alprazolam - Chlordiazepoxide - Bromazepam - Demoxepam - Nitrazepam - Oxazepam - Lorazepam - Desmethyldiazepam - Temazepam - Diazepam - Phenazepam - Zopiclone - Zolpidem - Zaleplon Cocaine group: - Cocaine - Benzoylecgonine	 Documented in house method (TP1240) using : - UPLC-HRMS

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
BODY FLUIDS and TISSUES (cont'd) Blood (Preserved, Unpreserved) Urine (Preserved, Unpreserved (cont'd)	<u>Forensic Analysis</u> (cont'd) Confirmation of drugs (cont'd) : Amphetamine group: - Amphetamine - Methamphetamine - Chloroamphetamine - MDMA - MDA - MDEA - PMA - PMMA - Methylphenidate - Ethylphenidate - MBDB - 2C – B - 2C –I - DOB (2,5 - Dimethoxy-4-bromo-amphetamine) - DOM Novel Psychoactive Substances: - Cathinone - Ethylone - Methedrone - Methylone - Butylone - Pentylone - MDPBP - BMDP - Methcathinone - Buphedrone - Mephedrone (4-MMC) - 4 - Methyl - paramethyl - aminorex - BZP (Benzylpiperazine) - MDPV (Methylenedioxy - pyrovalerone) - TFMPP (Trifluoromethyl-phenylpiperazine)	Documented in house method (TP1240) using : - UPLC-HRMS

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
BODY FLUIDS and TISSUES (cont'd)	Forensic Analysis (cont'd)	
Blood (Preserved, Unpreserved) Urine (Preserved, Unpreserved (cont'd)	Confirmation of drugs (cont'd) : Anti-epileptics Group: - Pregabalin - Lamotrigine - Carbamazepine - Phenytoin Cannabis group: - Delta-9-THC (Blood Only) - 11-Hydroxy– delta-9-THC - 11-Carboxy-delta- 9-THC Miscellaneous: Risperidone Chlorpheniramine Propranolol Diphenhydramine Cyclizine Promethazine Amiodarone (Blood Only) Paracetamol Ketamine	Documented in house method (TP1240) using : - UPLC-HRMS
DOCUMENTS	Forensic Analysis	
Handwriting (Roman script)	The examination of submitted items to compare handwriting from known and suspect sources to establish links and/or authorship	Documented In-House Methods using - Microscopy - ESDA
Signatures	The examination of submitted items to compare signatures from known and suspect sources to establish links and/or authorship	Documented in house method using - visual examination - low power microscopy - photography
Paper and other material	Detection and enhancement of indented marks made by handwriting	Documented in house method using - oblique lighting - low power microscopy - ESDA

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
DOCUMENTS (cont'd)	Forensic Analysis (cont'd)	
Printing Machines and their output including Impact and Non-Impact Printers and Photocopies	Comparison of office printing equipment and outputs with suspect material	Documented in house method using - visual examination, - microscopy, - physical fit - visual comparison
Documents	Detection of alterations and decipherment of altered or obliterated entries - Ink examination - Paper examinations - Photocopying	Documented in house method using - lighting techniques, - visual examination - microscopy - VSC
EXPLOSIVES	Forensic Analysis	
Trace Explosives	Recovery of explosives at trace level	Documented In-House Methods using swabs
	Identification of explosives at trace level	Documented In-House Methods using - GC/TEA - UPLC-HRMS
Non-Trace, Pyrotechnics and Associated Material	Identification of energetic materials	Documented In-House Methods using - FTIR Spectroscopy
FIBRES	Forensic Analysis	
	Search and recovery of fibres from clothing and objects for analysis	Documented in house method using - visual examination, - low power microscopy and screening, - fibre recovery (taping) mounting
	Identification of fibre type	Documented in house method using - FTIR
	Comparison of fibres	Documented in house method using - stereo microscopy - comparison microscopy -
	Spectroscopic analysis of fibres in the visible range for the purpose of comparison of fibres	Documented in house method using - MSP (visiblelight)

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
FIREARMS	<u>Forensic Analysis</u>	
Ammunition	Examination of discharged ammunition components to determine the number of guns used.	Documented In house methods using comparison microscopy
	Examination of cartridges to determine if ammunition has been loaded into a firearm	Documented In house methods using : - Microscopy - comparison microscopy
	Comparison of spent ammunition to suspect guns	Documented In house methods using comparison microscopy
	Ammunition and component identification and legal classification	Documented In house method using : - Weighing - length measurement - use of known samples or standard reference data.
Firearms	Firearm and firearm component part identification and legal classification (Firearms Act 1968)	Documented In house method using comparison with known samples, reference standards and publications
	Firearm identification from class marks present on ammunition components	In house method using comparison with known samples and use of reference databases.
	Determination of Kinetic Energy of projectiles	Documented In house method using chronograph and balance
	Test Firing to assess the functionality of weapons and/or ammunition.	Documented In house method using suspect or reference guns and ammunition
	Test Firing to generate test samples of ammunition for comparison to exhibits	Documented In house method using suspect or reference guns and ammunition

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
FLAMMABLE LIQUIDS (FIRE ACCELERANTS)	Forensic Analysis	
Material Recovered from and associated with Fire Scenes Common fire accelerant liquids	Examination and analysis of the following flammable liquids: - petrol - paraffin - diesel - white spirit	Documented In-House Methods using: - GC-FID - GC-MS
GUN SHOT RESIDUE (GSR / FDR / CDR)	Forensic Analysis	
Any Material Including type of matrix Bore Wipes	Recovery of in-organic gun shot residues (primer)	Documented in house method using - Vacuuming - Carbon coated aluminium stubs
	Recovery of organic gun shot residue (propellant)	Documented in house method using - Swabbing - Vacuuming - Filtering
Recovered Material	Identification of in-organic gun shot residues (primer)	Documented in house method using - SEM/EDX - SEM/EDS
	Identification of organic gun shot residues (propellant)	Documented in house method using - GC TEA - UPLC-HRMS

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
MARKS AND IMPRESSIONS	Forensic Analysis	
Fingermarks Any material which is capable of retaining friction ridge marks	Enhancement of fingermarks	Documented In-House Methods using chemical enhancement and lighting techniques : - Acid Treatments: Fuschin Acid, Acid Black 1 - Cyanoacrylate (CNA) Fuming - Basic Yellow 40 (BY40) - Rhodamine-6-G - Gentian Violet - Basic Red 14 - Safranine O - Powdering Techniques : (flake, magnetic and non-magnetic) - 1,8-Diazafluoren-9-one (DFO) - Physical Developer - Ninhydrin - Sudan Black - Sablised Iodine - Leuococrystal Violet - Selenious Acid etching - ISO Mark Casting
Fingermarks Any material which is capable of retaining friction ridge marks	Enhancement of fingermarks	Documented In-House Methods using lighting techniques - White Light and Filtered Sources - High Energy Light Sources Documented In-House Methods for imaging / digital capture
Footwear marks (physically or image)	Enhancement of footwear marks recovered from scenes	Documented in house method using - lighting techniques - powders - ESLA - digital capture photography

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
MARKS AND IMPRESSIONS (cont'd)	Forensic Analysis (cont'd)	
	Production of test marks from suspect footwear	Documented in house method using - Black powder, adhesive film plus clear acetate sheet - Vegetable oil and Magna black method - Gel Lifting - digital capture photography
Footwear mark (physically or image)	Assessment, Comparison and evaluation of footwear with scene marks	Documented In-House methods using visual examination, low power microscopy and dimensional measurements
MOBILE PHONE HANDSETS, (U)SIM CARDS AND ASSOCIATED MEMORY CARDS	Forensic Analysis	
	Logical capture and preservation of data (SIM Card, Handset, Memory Card)	Documented In-house methods using manual extraction and the following 3rd party data extraction software : - Micro Systemation AB (MSAB) XRY - Cellebrite UFED
VEHICLE COMPONENTS	Forensic Analysis	
Wheel assemblies removed from vehicles (tyres)	Examination of wheel assemblies and constituent parts of wheel assemblies (rims, tyres, inner tubes) Identification of damage and defects - Measurement of tread depth - Measurement of valve back pressure	Documented In-House Method using: - visual examination, - optical microscopy, - length measurement - pressure measurement
Light bulbs from motor vehicles and pedal bicycles	Examination and investigation of cause of failure or defect	Documented In-House Methods using visual examination, optical microscopy, electrical continuity illumination test
END		