


Schedule of Accreditation

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United Kingdom Accreditation Service

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

 <p>Accredited to ISO/IEC 17025:2005</p>	Orchid Cellmark Ltd (trading as Cellmark)	
	Issue No: 068 Issue date: 03 November 2017	
	Unit 16 Blacklands Way Abingdon Business Park Abingdon Oxfordshire OX14 1DY	Contact: Mr Peter Harper Tel: +44 (0)1235 528609 Fax: +44 (0)1235 554428 E-Mail: pharper@cellmark.co.uk Website: www.cellmarkforensics.co.uk Website: www.cellmark.co.uk
Testing performed by the Organisation at the locations specified below		

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details	Activity	Location code
Address Unit 16 Blacklands Way Abingdon Business Park Abingdon Oxfordshire OX14 1DY	Local contact Mr Peter Harper Tel: +44 (0)1235 528609 Fax: +44 (0)1235 554428 E-Mail: pharper@cellmark.co.uk Website: www.cellmark.co.uk	Forensic Testing; Paternity and Relationship testing; Forensic and Veterinary, Forensic Analysis A
Address Unit 1 Buckshaw Link Ordnance Road Buckshaw Village Chorley Lancashire PR7 7EL	Local contact Mr Peter Harper Tel: +44(0)1235 528609 Fax: +44(0)1235 554428 E-Mail: pharper@cellmark.co.uk Website: www.cellmark.co.uk	Forensic Analysis B



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DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
BODY FLUIDS and TISSUES	<u>Forensic Testing</u>	The organisation has demonstrated adherence to the relevant requirements of the Forensic Science Regulators Code of Practice and Conduct (Version 3.0, February 2016) in relation to their Forensic Activities	A, B
	<u>Forensic Analysis</u>		
Blood	DNA Profiling: Short Tandem Repeat (STR) DNA profiling for forensic analysis of:	Documented In-House Methods using manual/automated extraction	A
- Whole	- Low Template DNA (elevated cycle number (SGM Plus) and post PCR enhancement SGM Plus and NGM SElect))	- Automate Express (FSP0124)	
- Stains	- Crime Scene Samples meeting the requirements of the Custodian for the Purpose of Supply to the National DNA Database	- Qiagen (EZ1) (FSP0050)	
- FTA cards	- Subject Samples (PACE and Volunteer) meeting the requirements of the Custodian for the Purpose of Supply to the National DNA Database	- Chelex (FSP0038)	
Semen	- Elimination Database samples (VED/SED and PED)	- FTA purification (STR0187/FSP0156)	
- Whole	- Environmental Monitoring Samples	- DNA IQ (STR0119)	
- Azoospermic		Documented In-House Methods using manual quantification	
Saliva		- Pico Green (QC0005/STR0161)	
- Whole		- Oli Green (QC0005/STR0161)	
- Stains		Real Time Quantification using Quantiplex HYres Dual RT-PCR (FSP0054)	
- FTA Cards		Documented In-House Methods (FSP0156/STR0159) using manual amplification (PCR) and the following chemistry:	
- Swabs (buccal cells)		- SGM Plus	
Hair		- NGM SElect	
Cellular Material		Documented In-House Methods (FSP0028/STR0162/STR0183) using Electrophoresis	
		- Applied Biosystems 3100/3130/3130xl Genetic Analyser©	



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
BODY FLUIDS and TISSUES (cont'd)	<p><u>Forensic Analysis</u> (cont'd)</p> <p><u>Related Opinions and Interpretation</u></p> <p>Interpretation of DNA profiles generated internally from crime stains (single source/major-minor mixtures/complex mixtures) and reference samples</p> <p>Statistical analysis and comparison of DNA profiles generated from crime stains with compatible reference DNA profiles (internally generated or from other accredited laboratories)</p> <p><u>Forensic Testing</u></p>	<p>Documented In-House methods (STR0147/STR0183/STR0184/STR0194/FRP0122/FSP0133/GM0004/GM0005/FSP0021)</p> <ul style="list-style-type: none"> - Genetic Characterisation <ul style="list-style-type: none"> o GMID 3.2.1 o GeneMapper IDX o Expert systems: <ul style="list-style-type: none"> ▪ Mixtures Analyser ▪ Sequencher ▪ DNA Resolve ▪ ReliCalc ▪ STRMix (v2.3) 	<p>A</p> <p>A</p> <p>A, B</p> <p>A</p> <p>A, B</p> <p>A, B</p> <p>A, B</p>
<p>Blood</p> <ul style="list-style-type: none"> - FTA cards <p>Saliva</p> <ul style="list-style-type: none"> - FTA Cards 	<p>DNA Profiling: Short Tandem Repeat (STR) DNA profiling for forensic analysis of:</p> <p>Subject Samples for input into population databases.</p>	<p>Documented In-House Methods (STR0202) & manufacturer specifications using FTA purification (STR0187/FSP015) and amplification (PCR) using the following chemistry:</p> <ul style="list-style-type: none"> - PowerPlex® Fusion 6C <p>Documented In-House Methods (STR0203) using Electrophoresis:</p> <ul style="list-style-type: none"> - Applied Biosystems 3500 Genetic Analyser© <p>Genetic characterisation using documented in-house methods (STR0204):</p> <ul style="list-style-type: none"> - GeneMapper IDX v1.4 	<p>A</p>



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<p>BODY FLUIDS and TISSUES (cont'd)</p> <p>Blood</p> <ul style="list-style-type: none"> - Whole - Stains - FTA cards <p>Semen</p> <ul style="list-style-type: none"> - Whole - Azoospermic <p>Saliva</p> <ul style="list-style-type: none"> - Whole - Stains - FTA Cards - Swabs (buccal cells) <p>Faeces</p> <p>Urine</p> <p>Stomach Contents</p> <p>Hair</p> <p>Cellular Material</p> <p>Body Tissue</p> <ul style="list-style-type: none"> - Nail - Muscle - Bone - Teeth - Amniotic Fluid - Products of conception 	<p><u>Forensic Analysis</u> (cont'd)</p> <p>DNA Profiling: Short Tandem Repeat (STR)/Mitochondrial/Y Chromosome DNA profiling for forensic analysis of:</p> <ul style="list-style-type: none"> - Low Template DNA (elevated cycle number and post PCR enhancement) - Crime Scene Samples 	<p>Documented In-House Methods using manual/automated extraction</p> <ul style="list-style-type: none"> - Automate Express (FSP0124) - Chelex (FSP0038) - FTA purification (STR0187/FSP0156) - DNA IQ (STR0119) <p>Documented In-House Methods using Manual quantification</p> <ul style="list-style-type: none"> - Oli Green (QC0005/STR0161) - Real Time Quantification using Quantiplex HYres Dual RT-PCR (FSP0054) Mini-gel <p>Documented In-House Methods using Manual amplification (PCR) and the following chemistry:</p> <ul style="list-style-type: none"> - SGM Plus (FSP0156/STR0159) - NGM SElect - Identifiler - Yfiler (FSP0156) - mtDNA (MIT0004) - Minifiler (FSP0070) - Powerplex Y23 (FSP0149) <p>Documented In-House Methods (FSP0028/STR0162/STR0188) using Electrophoresis</p> <ul style="list-style-type: none"> - Applied Biosystems 3100/3130/3130xl Genetic Analyser© 	<p>A</p>



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BODY FLUIDS and TISSUES (cont'd)	<p><u>Forensic Analysis</u> (cont'd)</p> <p><u>Related Opinions and Interpretation</u></p> <p>Interpretation of DNA profiles generated internally from crime stains (single source/major-minor mixtures) and reference samples</p> <p>Statistical analysis and comparison of DNA profiles generated from crime stains with compatible reference DNA profiles (internally generated or from other accredited laboratories)</p>	<p>Documented In-House methods (STR0168/STR0183/STR0184/STR0194/FRP0135)</p> <ul style="list-style-type: none">- Genetic Characterisation<ul style="list-style-type: none">o GMID 3.2.1o Expert systems:<ul style="list-style-type: none">▪ Sequencher	A



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BODY FLUIDS and TISSUES (cont'd)	<u>Forensic Analysis</u>		
ANY MATERIAL	<p>Searching for:</p> <ul style="list-style-type: none"> - Blood - Semen - Saliva - Urine - Hairs 	<p>Documented In-House Methods (FSP0027/FSP0069) using:</p> <ul style="list-style-type: none"> - visual examination - White light and filter source - High Energy light Sources - low power microscopy - high power microscopy - chemical testing (see below) 	A, B
	<p>Recovery and preparation for subsequent DNA analysis or for contingency purposes of the following from searched materials and swabs:</p> <ul style="list-style-type: none"> - Blood - Semen - Saliva - Hairs - Cellular Material 	<p>Documented In-House Methods (FSL0002) using:</p> <ul style="list-style-type: none"> - cutting - swabs and swabbing - extraction of stained materials - extraction of swabs - taping - mini-taping 	A, B
Blood	<p>Presumptive testing for blood via detection of:</p> <ul style="list-style-type: none"> - Peroxidase - Human Haemoglobin 	<p>Documented In-House Methods (FSL0070, FSL0013, FSL0031, FSL0058, FSL0082) using:</p> <ul style="list-style-type: none"> - Visual Examination - Alternative light sources - KM (Kastle Meyer) - Hemastix (A only (CS DNA)) - Luminol - Hydrogen Peroxide - OBTI 	A, B
	<p><u>Related Opinions and Interpretations</u></p> <p>Identification, interpretation and recording of blood patterns (BPA) on clothing and other items examined at the laboratory</p>	<p>Documented In-House Methods (FSL0044/TG0010) using:</p> <ul style="list-style-type: none"> - visual examination - low power microscopy - dimensional measurement 	A, B



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BODY FLUIDS and TISSUES (cont'd)	<u>Forensic Analysis</u> (cont'd)		
Semen	Presumptive testing for seminal fluid, via detection of: <ul style="list-style-type: none"> - Acid Phosphatase - Choline 	Documented In-House Methods (FSL0005, FSL0007) using: <ul style="list-style-type: none"> - Visual Examination - Alternative light sources - Acid phosphatase detection (colour reaction) - Choline detection by Florence Iodine test 	A, B
	Confirmatory testing for seminal fluid via identification of spermatozoa	Documented In-House Methods (FSL0009/FSL0017/FSL0008) using: <ul style="list-style-type: none"> - High power microscopy - Christmas Tree staining - Haematoxylin and Eosin staining 	A, B
Saliva	Presumptive testing for saliva via detection of: <ul style="list-style-type: none"> - Amylase 	Documented In-House Methods (FSL0004) using: <ul style="list-style-type: none"> - Visual examination - Alternative light sources - Phadebas paper - Phadebas tube test 	A, B
Urine	Presumptive testing for urine via detection of: <ul style="list-style-type: none"> - Urea 	Documented In-House Methods (FSL0060) using: <ul style="list-style-type: none"> - Visual examination - Alternative light sources - DMAC - Azostix 	A, B
Hairs	Differentiation of human and animal hairs	Documented In-House Methods (FSL0010/FSL0068) using: <ul style="list-style-type: none"> - visual examination - low power microscopy - high power microscopy 	A, B



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BODY FLUIDS and TISSUES (cont'd)	<u>Forensic and Veterinary</u>		
Blood Body Tissue DNA FTA Cards	Analysis of Bovine Short Tandem Repeat (STR) loci	Documented In-House Methods defining extraction, amplification, electrophoresis and profile designation of Bovine samples using Finnzymes kit 1.2 (BOVSTR0003)	A
Forensic samples and meat products	<u>Related Opinions and Interpretations</u> Identification of animal species by sequencing of the 12S rRNA mitochondrial gene from DNA extracts	Documented In-House Methods (SID0004) defining extraction, amplification, sequencing and analysis and comparison with reference sequences and analysis (SID0001-05). In house methods for relationship analysis (BOVSTR0006-7)	A
BODY FLUIDS and TISSUES - TOXICOLOGY	<u>Forensic Analysis</u>		
Hair	Screening for the presence of drugs of abuse: - Amphetamines - Benzodiazepines - Cocaine - Ketamine - Methadone - Methamphetamine - Mephedrone - Opiates	Documented in house method (TOX0009) using liquid-liquid extraction and LC-MSMS	A
Hair	Confirmation and quantitation of: Amphetamine Group : - Amphetamine - Methamphetamine - MDA - MDMA - MDEA - MBDB - Mephedrone	Documented in house method (TOX0013) using liquid-liquid extraction and LC-MSMS	A



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BODY FLUIDS and TISSUES TOXICOLOGY (cont'd)	<u>Forensic Analysis</u> (cont'd)		
Hair	Confirmation and quantitation of (cont'd): Cocaine Group : - Cocaine - Cocaethylene - Benzoylcegonine - Norcocaine - Anhydroecgonine methyl ester (AEME) - Ecgonine methyl ester (EME) Opioid Group : - Methadone - EDDP Benzodiazepines Group - Diazepam - Temazepam - Oxazepam - Chlordiazepoxide - Desmethyldiazepam Opiate Group : - Morphine - Codeine - 6-Monoacetylmorphine (6-MAM) - Heroin - 6 – Acetylcodeine - Dihydrocodeine	Documented in house method (TOX0013) using liquid-liquid extraction and LC-MSMS	A
Hair	Confirmation and quantitation: - Ketamine	Documented in house method (TOX0014) using liquid-liquid extraction and LC-MSMS	A
	Confirmation and quantitation: - Ethyl Glucuronide (EtG)	Documented in house method (TOX0015) using solid phase extraction and GC-MSMS	A



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BODY FLUIDS and TISSUES -TOXICOLOGY (cont'd)	<u>Forensic Analysis</u> (cont'd)		
Hair	Confirmation only : Cannabis Group : - Cannabinol - Cannabidiol	Documented in house method (TOX0011) using solid-phase extraction and GC-MSMS	A
Hair	Confirmation and quantitation: Cannabis Group : - THC - THC-OH - THC-COOH	Documented in house method (TOX0011) using solid-phase extraction and GC-MSMS	A
Whole Blood (Preserved)	Detection and quantitation of drugs in relation to s5A of the Road Traffic Act 1988 (as amended) and The Drug Driving (Specified Limits) (England and Wales) Regulations 2014: Amphetamine (250 ug/L) Benzoylcegonine(50 µg/L) Clonazepam (50 µg/L) Cocaine (10 µg/L) Diazepam (550 µg/L) Flunitrazepam (300 µg/L) Ketamine (20 µg/L) Lorazepam (100 µg/L) Lysergic Acid Diethylamide – LSD (1µg/L) Methadone (500 µg/L) Methylamphetamine (10 µg/L) Methylenedioxymethampheta mine – MDMA (10 µg/L) 6-Monoacetylmorphine (5 µg/L) Morphine (80 µg/L) Oxazepam (300 µg/L) Temazepam (1000 µg/L)	Documented in house (TOX0026) using: - Protein Precipitation - LCMS-MS	A



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BODY FLUIDS and TISSUES - TOXICOLOGY (cont'd)	<u>Forensic Analysis</u> (cont'd)		
Whole Blood (Preserved) (cont'd)	Delta-9-tetrahydrocannabinol (THC) (2 µg/L)	Documented in house (TOX0024) using: - Solid phase extraction - GC-MS-MS	A
Blood (Preserved, Unpreserved)	Detection and quantification of alcohol in relation to the Road Traffic Act. (10mg/mL)	Documented in house (TOX0029) using : - HS-GC-FID,	A
	Qualitative and Quantitative Analysis of Drugs of Abuse		
	Amphetamines: - Amphetamine - Butylone - Methamphetamine - Methylenedioxyamphetamine (MDA) - Methylenedioxymethamphetamine (MDMA) - Methylenedioxypropylamphetamine (MDPV) - Methylone - Naphyrone	Documented in house (TOX0026) using: - Protein Precipitation - LCMS-MS	A
	Benzodiazepines: - Alprazolam - Clonazepam - Diazepam - Desmethyldiazepam - Flunitrazepam - Lorazepam - Oxazepam - Phenazepam - Temazepam		A
	Cathinones: - Mephedrone - (4-Methylmethcathinone)		A



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BODY FLUIDS and TISSUES - TOXICOLOGY (cont'd) Blood (Preserved, Unpreserved) (cont'd)	<u>Chemical Analysis</u> (cont'd) Qualitative and Quantitative Analysis of Drugs of Abuse (cont'd) Cannabinoids: Cannabidiol Cannabinol Carboxy-THC (THC-COOH) Delta-9-tetrahydrocannabinol (THC) Hydroxy-THC (THC-OH)	Documented in house (TOX0024) using: - Solid phase extraction - GCMS-MS	A
DAMAGE Damage (Clothing and Fabric material)	<u>Forensic Analysis</u> <u>Related Opinions and Interpretations</u> Examination, assessment and evaluation of a damage item, comparison of damage with suspected instrument to determine the likelihood the suspected instrument caused the damage.	Documented In-House Methods (FSL0003) using: - visual examination - microscopy - dimensional measurement - Physical fit (FSL0075/FSL0039)	A, B
FIBRES	<u>Forensic Analysis</u> Recovery of fibres for contingency purposes from clothing and objects Search and recovery of fibres from clothing and objects for analysis (including tapings)	Documented in house method (FSL0010/FSL0055) using - visual examination - low power microscopy - taping - forceps Documented in house method (FSL0010/FSL0055) using - visual examination, - low power microscopy and screening - fibre recovery (taping) - mounting	A, B B



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FIBRES (cont'd)	<u>Forensic Analysis</u> (cont'd)		
	Identification of fibre type	Documented in house method (FRP0085/ FSL0087/FSL0089) using <ul style="list-style-type: none"> - polarised light microscopy - FTIR - MSP 	B
	Spectroscopic analysis of fibres in the visible range for the purpose of comparison of fibres	Documented in house method (method ref) using <ul style="list-style-type: none"> - visible Microspectrophotometry 	
	Comparison of fibres	Documented in house method (FRP0085/ FSL0087/FSL0089) using <ul style="list-style-type: none"> - stereo microscopy - polarised light microscopy - comparison microscopy - FTIR - MSP 	B
	<u>Opinion and Interpretation</u>		B
	The evaluation of the significance of any matching features between the suspect and reference/control fibre to determine the likelihood of the suspect fibre coming from a specific source		
<u>FLAMMABLE LIQUIDS (FIRE ACCELERANTS)</u>	<u>Forensic Analysis</u>		
Material Recovered from and associated with Fire Scenes			
Debris and materials recovered from fires and suspected fire scenes	Recovery of potential fire accelerants	Documented in-house method using <ul style="list-style-type: none"> - Direct sampling - Headspace sampling 	A, B



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Common fire accelerant liquids	Recovery of potential fire accelerants	Documented in-house method (ACCEL0002) using - Direct sampling - Headspace sampling	A, B
	Examination and analysis of the following flammable liquids - Petrol - Paraffin - Turpentine substitute - White spirit - Diesel - Alcohols (methanol/ethanol)	Documented in house method (ACCEL0003) using - TENAX - ATD-GCMS	B
<u>FLAMMABLE LIQUIDS (FIRE ACCELERANTS) (cont'd)</u> Material Recovered from and associated with Fire Scenes (cont'd)	<u>Forensic Analysis (cont'd)</u> Analysis and identification of common fire accelerants : - Petrol - Paraffin - Turpentine substitute - White spirit - Diesel - Alcohols (methanol/ethanol) - Lighter Fuels	Documented in house method (ACCEL0003) using - TENAX - ATD-GCMS	B
GLASS	Comparison of common fire accelerants	Documented in house method (ACCEL0004) using - ATD-GCMS	A, B
	<u>Forensic Analysis</u> Search and recovery of glass fragments from clothing and objects	Documented In-House Methods (FSL0029/FSL0033) using visual examination and low power microscopy	A, B



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	Preparation of glass fragments for SEM Analysis	Documented In-House Method (FSL0066) involving stub preparation.	A, B
	Characterisation of glass fragments	Documented In-House methods (FSL0035/FSL0036/FSL0037) using <ul style="list-style-type: none"> - refractive index determination by oil immersion (GRIM 3) - low power and interference microscopy - re-annealing by tube furnace 	A, B A, B A A, B
	<u>Opinion and Interpretation</u> The evaluation of the significance of any matching features between the suspect and reference/control glass to determine the likelihood of the suspect glass coming from a specific source.	Documented in house method <ul style="list-style-type: none"> - Database 	A, B
GUN SHOT RESIDUE (GSR / FDR)	<u>Forensic Analysis</u>		
Any Material	Recovery of in-organic gun shot residues (primer)	Documented in house method (FSL0078) using <ul style="list-style-type: none"> - carbon coated aluminium stubs - Wipes - Swabbing 	A, B
Recovered Material	Identification of in-organic gun shot residues (primer)	Documented in house method (GSR0002/GSR0010) using SEM/EDX	A



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MARKS AND IMPRESSIONS Footwear Footwear mark (physically or image) Toolmarks	<u>Forensic Analysis</u>		
	Enhancement of footwear marks recovered from scenes	Documented in house method (FSL0026/FSL0090) using <ul style="list-style-type: none"> - lighting techniques - ESLA - gel lifting - digital capture photography 	A, B
	Production of test marks from suspect footwear	Documented in house method (FSL0025) using <ul style="list-style-type: none"> - casting (dental stone/bio foam) - powders (Bristol black/aluminium/light mineral oil/magnetic powder) - digital capture photography 	A, B
	Assessment, comparison and evaluation of footwear with scene marks	Documented In-House methods (FSL0025) using visual examination, low power microscopy and dimensional measurements	A, B
	<u>Opinion and Interpretation</u> The evaluation of the significance of any matching features between the suspect and reference/control footwear marks to determine the likelihood of the suspect mark coming from a specific footwear	Documented In-House methods using <ul style="list-style-type: none"> - Personal experience - Database – NFRC system for coding of marks 	A, B
	Enhancement of toolmarks	Documented in house method (FSL0057) using <ul style="list-style-type: none"> - lighting technique - casting - digital capture/photography 	B
Production of test marks from suspect items	Documented in house method (FSL0057) using <ul style="list-style-type: none"> - casting - digital capture/photography 	B	



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

Orchid Cellmark Ltd (trading as Cellmark)
Issue No: 068 Issue date: 03 November 2017

Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code	
MARKS AND IMPRESSIONS (cont'd)	<u>Forensic Analysis</u> (cont'd)			
	Toolmarks	Comparison of submitted marks or marks made from suspect items with marks left at scene	B	
		<u>Opinion and Interpretation</u> The evaluation of the significance of any matching features between the suspect and reference/control toolmarks to determine the likelihood of the suspect mark coming from a specific tool	Documented In-House methods (FSL0057) using - Personal experience	B
	Marks in blood	Location and enhancement of marks in blood from items recovered from crime scenes	Documented in house method (FSL0026/FSL0070) using - Sulphosalicylic acid - Hydrogen Peroxide - methanol and heat fixing acid black 1 and leuco crystal violet	B
PAINT	<u>Forensic Analysis</u>			
	Search and recovery of paint and paint fragments from clothing and objects	Documented in house method (FSL0029) using - visual examination - low power microscopy	A, B	
	Comparison of recovered and control samples	Documented in house method (FSL0061/FSL0062/FSL0064) using - spot tests - florescence - high power microscopy	A, B	



2045
Accredited to
ISO/IEC 17025:2005

Schedule of Accreditation
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MARKS AND IMPRESSIONS (cont'd)	<u>Forensic Analysis</u> (cont'd)		
PAINT	<u>Opinion and Interpretation</u> The evaluation of the significance of any matching features between the suspect and reference/control paint samples to determine the likelihood of the suspect paint fragment coming from a specific source.	Documented in house method	A, B
ALCOHOL TECHNICAL DEFENCE			
Alcohol Technical Defence (in relation to RTA) for sample matrix including Blood/urine/breath	Estimation of alcohol consumption and elimination with respect to validity of drinking patterns: 1) Effect of alleged post accident alcohol consumption on measured breath/body fluids alcohol levels 2) Effect of alleged spiked drink 3) Back calculations of breath/blood/urine alcohol levels to the time of accident or other incident from 20mg% and above	Documented in house methods using mathematical calculations	A
END			