

Health & Safety Laboratory

Analytical Services List 2010/11



The Health and Safety Laboratory is an
Agency of the Health and Safety Executive

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Health & Safety Laboratory

Analytical Services List 2010/11

This brochure has been produced by the Health and Safety Laboratory (HSL) to provide detailed listings of the routine analytical services that we provide to our customers. If you don't see what you need, or your requirements are more bespoke, please contact us - we can usually help. For further information call our Analytical Services Business Support Team on 01298 218099



About the Health & Safety Laboratory

HSL was originally set up to help the Health and Safety Executive – otherwise known as HSE – to minimise risks to people's health and safety at work. Today, with over 30 years' experience, investment and growth under our belt, HSL can offer expertise in a wide range of analytical services. So, as well as continuing to support HSE, we now work with a wide range of other public and private-sector organisations, often conducting detailed, bespoke research and development work on their behalf.

Based in our facility in Derbyshire, HSL is a centre of excellence, with practical expertise across a range of areas from analytical sciences, social and geographical science, engineering, and process safety. In partnership with many sectors of industry, HSL develop bespoke solutions that help employers reduce injuries, accidents, and ill health amongst their workforce, increasing productivity and delivering healthier workplaces. In addition to the wide range of analytical services, HSL social scientist can help customers identify ways to improve the health and safety culture of organisations.

HSL's breadth of expertise and focus on solution led science has earned the organisation an international reputation as a centre of excellence for health and safety research, incident investigation and consultancy. For further information on wider HSL services, contact our Business Enquiries line on 01298 218218.

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Organic analyses

Analyte	Method ref
Acrylamide	MDHS 57
Acrylonitrile	MDHS 88 & MDHS 96
Aldehydes	ISO 16000-3 & MDHS 78 & MDHS 93
Anaesthetics (Nitrous oxide & vapourising) by ATD	In-house method
Aromatic amines	MDHS 75
Aromatic carboxylic anhydrides	MDHS 62
Azodicarbonamide	MDHS 92
1,3-butadiene	MDHS53/2 & MDHS63/2
2,3-Butanediene (diacetyl) in butter / fat	In-house method
Cristobalite (XRD) on filters	MDHS 101
Cristobalite (XRD) in bulk material	In-house method
Cyanoacrylates	In-house method
C1 - C4 Bulk gases	In-house method
Dimethyl & diethyl sulphate	MDHS 89
Gases (N2, He, H2, etc.) by GC/TCD	In-house method
Hydrazine	MDHS 86
Hydroquinone	MDHS 98
Isocyanates (monomer and/or polymer)	ISO 16702 & MDHS 25/3
Lactose	Documented in house method IM OP415 using ion chromatography
Mineral oil mist from MWF	MDHS 84
Pesticide formulation testing	CIPAC methods
Pesticides or biocides on sampling devices	MDHS 94
Pesticides or biocides on vegetation	In-house method
Plastics (hard) identification (FT-IR)	In-house method
Plastics (soft) identification (pyrolysis)	In-house method
Polychlorinated biphenyls (PCB)	In-house method
Polycyclic aromatic hydrocarbons (PAH)	In-house method
Pyrolysis of materials (e.g. to identify fume evolved)	In-house method
Resin acids from solder fume	MDHS 83
Rubber fume	MDHS 47/2
Tobacco smoke - filter (respirable suspended particulate)	MDHS 14/3
Tobacco smoke - filter (UV-PM and F-PM)	ISO 15933
Tobacco smoke - filter (solanesol)	ISO 18144
Tobacco smoke - badge TD tube (nicotine & 3-EP)	ISO 18145
Triglycidyl isocyanurate (TGIC)	In-house method
Vinyl chloride monomer (VCM)	In-house method
VOC (from list) by ATD	MDHS 72 & MDHS 80
VOC (Total hydrocarbon) by ATD	MDHS 72 & MDHS 80

Services in bold are UKAS accredited

Prices available on request

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Indicative list of Pesticides and biocides in a range of matrices from standard sampling media or foods and vegetation by GC/M is given below

An Indicative list of Pesticides

Acephate	Dieldrin	Penconazole
Azinphos-methyl	Dimethoate	Pendimethalin
Azoxystrobin	Dinocap	Pentachlorophenol
Benazolin	Disulfoton	Phorate
Bifenthrin	Endosulfan (a,b)	Phosalone
Bromophos	Endosulfan sulphate	Phosmet
Bromopropylate	Ethion	Picloram
Bromoxynil	Ethoprophos	Pirimicarb
Buprofezin	Etriadazole	Pirimiphos-methyl
Captan	Fenarimol	Procymidone
Bupirimate	Fenitrothion	Propham
Captan	Fenoprop	Propiconazole
Carbaryl	Fenpropathrin	Propyzamide
Carbofuran	Fenvalerate	Pyrimethanil
Chlorfenvinphos	Flusilazole	Pyrazophos
Chloropropham	Folpet	Quinalphos
Chlorothalonil	Heptachlor	Quinomethionate
Chlorpyrifos	Heptenophos	Quintozene
Chloryrifos-methyl	Ioxynil	2,4,5-T
Clopyralid	Iprodione	Tecnazine
Cyfluthrin	Kresoxim-methyl	Tetradifon
Cyhalothrin	Lindane	Thiabendazole
Cypermethrin	MCPA	Thiometon
2,4-D	Mecarbam	Tolclofos-methyl
2,4-DB	Mecoprop	Tolyfluanid
DDD	Metalaxyl	2,4,5-TP
DDE	Malathion	Triademefon
DDT (Total)	Methamidophos	Triazophos
Deltamethrin	Methidathion	Trichlorfon
Demeton-S-methyl	Mevinphos	Triclopyr
Diazinon	Myclobutanil	Trifloxystrobin
Dicamba	Omethoate	Trifluralin
Dichlofluanid	Oxadixyl	Vamidothion
Dichloran	Parathion	Vinclozolin
Dichlorprop	Parathion-methyl	

Prices available on request

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VOC in Air by thermal desorption/gas chromatography using UKAS accredited operational procedure and other methods.

Volatile Organic Compounds (VOC) commonly found in both workplace and indoor/outdoor air samples can be actively (pumped) or diffusively sampled using simple sorbent tubes. Examples of occupational VOCs analysed are listed in the workplace exposure tables of EH40.

This generic method is based on thermal desorption (TD) - gas chromatography (GC) methods (refer to MDHS 22, 23, 43, 60, 63, 66, 72, 80 and ISO 16017-1, ISO 16017-2). It applies to measurement of airborne concentrations of volatile organic compounds (VOCs) eluting in the range C5 - C15, although quantitative measurements are normally of C5 - C12 VOCs. Measurements outside these ranges are possible for example HFCs or hydrocarbons gas C1 - C4 may also be analysed; methane determination requires a non-matrix held sample of gas. HFC, C2, C3 and C4 (including all isomers) may be matrix held on TD tubes or non-matrix held as gas samples. Substances outside the stated normal range may not be covered by the UKAS accreditation.

Sampling may be by either active or passive uptake onto TD sorbent tubes and it is essential to match the sampling environment, sorbent type and analysis method to best deliver the required meaningful result. Multiple VOC may be collected onto one sampler type but in some cases where incompatibility in VOC species occurs or at vastly differing concentrations of VOC more than one sample may be required.

Solvent desorption

Samplers and sampling methods are available on request (MDHS 88, 96)

In order to provide a tailor made quotation our Technical Specialists are available to discuss all aspects of your requirements



Aliphatic Hydrocarbons

n-alkanes, branched alkanes, alkenes, alkynes and similar cyclic structures, isoprenes, terpenes and other similar types

Aromatic Hydrocarbons

benzene and its derivatives including 2C-, 3C- and 4C-substituted benzenes and phenols, plus fused ring types such as naphthalenes and substituted naphthalenes

and any of the above structural types with one or more of the following substitutions;

Alcohols
Ketones
Halogenates
Thiols
Esters
Acetates
Glycolethers

some VOC species are also available by TD/GC methods by arrangement;

Epoxy-VOCs
Nitro-VOCs
Aldehydes (C6-C12)

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Indicative VOC – Typical Capability List (UKAS accredited)

1,1,1-Trichloroethane	Chloroform
1,1,2,2-Tetrachloroethane	cis 1,2-Dichloroethylene
1,1,2-Trichloroethane	Cyclohexane
1,2,3,4-Tetrahydronaphthalene	Cyclohexanone
1,2,3-Trichloropropane	Dichloromethane
1,2,3-Trimethylbenzene	Diethylether
1,2,4-Trimethylbenzene	1,2,4-Trimethylbenzene
1,2-Dibromomethane	Ethanol
1,2-Dichlorobenzene	Ethoxyethanol
1,2-Dichloroethane	Ethoxyethyl acetate
1,2-Dichloropropane	Ethyl acetate
1,2-Dimethylcyclohexane	Ethyl Methacrylate
1,3,5-Trimethylbenzene	Ethylacrylate
1,3-Diethylbenzene	Ethylbenzene
1,3-Dimethyl-4-ethylbenzene	Ethylcyclopentane
1,3-Dimethylcyclohexane	Furfural
1,4-Dichlorobenzene	Hexachloro-1,3-butadiene
1,4-Diethylbenzene	Hexanal
1,4-Dimethylcyclohexane	iso-Butanol (2-methyl-propan-1-ol)
1-Ethoxy-2-propanol	iso-Butyl acetate
1-Methoxy-2-propanol (PGME)	iso-Propanol
1-Methoxy-2-propylacetate (PGME Acetate)	iso-Propyl acetate
1-Methyl-2-isopropylbenzene	iso-Propylbenzene
1-Methylnaphthalene	Limonene
2,2,3-Trimethylbutane	m-Cresol
2,2,4-Trimethylpentane	Methanol
2,2-Dimethylbutane	Methoxyethyl acetate
2,2-Dimethylheptane	Methyl methacrylate
2,2-Dimethylhexane	Methylcyclohexane
2,3,4-Tripentylpentane	Methylcyclopentane
2,3-Butanedione (diacetyl)	m-Ethyltoluene
2,3-Dimethylbutane	MTBE
2,3-Dimethylpentane	m-Xylene
2,4-Dimethylheptane	Naphthalene
2,4-Dimethylhexane	n-Butane
2,6-Dimethyloctane	n-Butanol
2-Butanone (MEK)	n-Butyl acetate
2-Heptanone	n-Butylbenzene
2-Methylbutane	n-Decane
2-Methylcyclohexanone	n-Dodecane
2-Methylheptane	

An indicative list of some of the general VOC commonly analysed for is continued over the page ➡

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Indicative VOC – Typical Capability List (UKAS accredited) *Cont...*

2-Methylhexane	Heptane
2-Methylnaphthalene	n-Hexane
2-Methylpentane	n-Nonane
3-Methylcyclohexanone	n-Octane
3-Methylheptane	Nonanal
3-Methylhexane	n-Pentadecane
3-Methylnonane	n-Pentane
3-Methyloctane	n-Propanol
3-Methylpentane	n-Propyl acetate
4-Hydroxy-4-methylpentan-2-one (Diacetone Alcohol)	n-Propylbenzene
4-Methyl-2-pentanone (MIBK)	n-Tetradecane
4-Methylcyclohexanone	n-Undecane
4-Methylnonane	o-Ethyltoluene
4-Methyloctane	o-Xylene
5-methylhexan-2-one	Ethylcyclopentane
Acetone	p-Cresol
Acetonitrile	propoxyethanol
Acrylonitrile	Hexanal
α -Pinene	Propylbromide
Benzaldehyde	p-Xylene
Benzene	sec-Butyl acetate
Benzyl chloride	Styrene
Bromoform	tert-Butyl acetate
Butan-2-ol	tert-Butylalcohol (2-methylpropan-2-ol)
Butoxyethanol	Tetrachloroethene
Butoxyethyl acetate	Tetrahydrofuran (THF)
Butylacrylate	Toluene
Carbontetrachloride	Trichloroethene
Chlorobenzene	Tridecane
	Vinylpyrrolidinone

Prices available on request



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Inorganic analyses

Analysis	Method reference
Alpha tricalcium phosphate – by X-ray diffraction	Pharmaceutical in-house method or by BS ISO 13779 – 3:2008
Ammonia on sorbent tubes by IC	OSHA ID-188:2002
Determination of Anions - Aqueous samples including aqueous extracts of air filter samples and sorbent tubes	In-house method based on BS ISO 21438 – 1:2007, BS ISO 21438-2:2009, ISO DIS 21438 - 3:2009 NIOSH 7903 Issue 2:1994
Arsenic & compounds on filters (ICP-MS)	Based upon MDHS 41/2
Chloramines on filter (as NCl ₃) by IC. HSL must supply filters	French INRS Metropol Fiche 007 method
Chrome VI on filters (welding fume, paint/pigmentation dust and chrome plating mists)	Based upon BS ISO 16740:2005
Cristobalite (XRD) on filters	MDHS 101
Cristobalite (XRD) in bulk material	In-house method
Hydrogen cyanide in impingers by ISE	MDHS 56/2
Hydrogen cyanide on sorbent tubes by IC	Based upon MDHS 56/2 and NIOSH 6017:2003
Hydrogen sulphide on sorbent tube by IC	OSHA 1008:2006
Hydroxyapatite - phase composition and crystallinity by X-ray diffraction	Pharmaceutical in-house method or by ISO 13779 – 3
Mercury vapour	Based on MDHS 16/2 and BS ISO 17733:2004
Metals on filters (ICP-AES)	BS ISO 15202-2:2004 and BS ISO 15202-3:2005
Metals on filters (XRF)	MDHS 91
MWF on filters (water based) by ICP-AES	MDHS 95/2
Peroxodisulphate salts on filters	MDHS79
Platinum & compounds on filter (ICP-MS)	Based upon MDHS 46/2
Quartz (XRD) on filters	MDHS 101
Quartz (XRD) in bulk material	In-house method
Respirable quartz or cristobalite in bulk powder (dustiness test) by X-ray diffraction	In-house method based on BS EN15051:2006 and NIOSH 7500:2003
Semi quantitative analysis of crystalline and amorphous content in a bulk powder by X-ray diffraction	In-house method based on Rietveld analysis software
Sulphur dioxide on sorbent tube by IC	OSHA 1011:2007
Whitlockite (beta tricalcium phosphate) - by X-ray diffraction	Pharmaceutical in-house method or by ISO 13779 – 3
Diesel particulate/fume	BS EN 14530:2004

Services in bold are UKAS accredited
Prices available on request



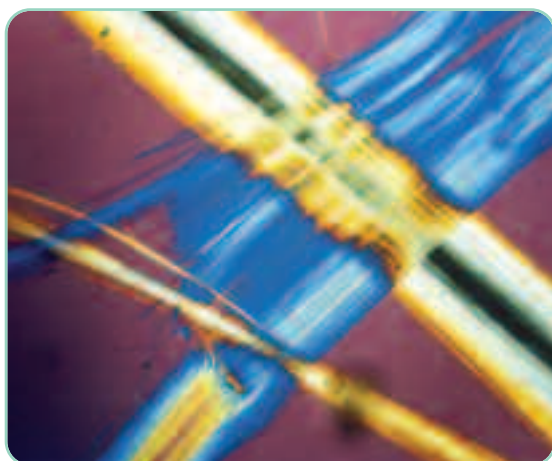
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Fibres analyses

Analysis	Method reference
Asbestos Fibres in Air	ISO 10312:1995, ISO 13794:1999 , NIOSH 7402: 1994 using TEM, ED and EDXA
Asbestos fibres in liquids and parenteral drugs	In-house method + ISO 13794:1999, EPA-600/R-94/134 and EPA-600/4-83-043:1983
Asbestos fibres in settled dusts	In-house method + ASTM D5755-95 and ASTM D5756-95
Asbestos fibres in minerals, soils, solids and asbestos products by TEM	In-house method based on ISO 13794:1999
Asbestos fibres in lung tissue sections, blocks and BAL fluids by TEM	In-house method based on ISO 13794:1999
Inorganic fibres and other fibres on prepared samples from air, liquids and solids by TEM	Documented in-house methods based on ISO 13794:1999
Asbestos identification in bulk by PLM	HSG248:2005
Asbestos in soils by PLM	In-house method based on HSG248:2005
Asbestos insulating board/cement differentiation	ACOP Method from CAR2006
Asbestos (percentage by mass) in bulk material by X-ray diffraction	In-house method
Asbestos (dustiness) release from soil by PCM	In house method based on HSG248:2005
Fibre + dust identification by optical microscopy/SEM	In-house method
Gravimetric analysis of filters for dusts and particulate	In-house method based on MDHS 14/3
Asbestos fibre counting on filters by PCM	HSG248:2005
Man-made fibre (including ceramics) counting on filters (PCM)	MDHS 59

Prices available on request





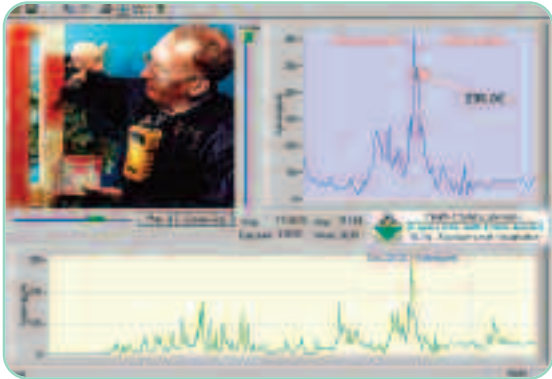
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Gas analyses

Analyte	Method ref
Carbon dioxide	Infrared
Carbon monoxide	Infrared
Methane	Infrared (cross-sensitive to other hydrocarbons)
Mines air	In-house method
Oxygen	Paramagnetic

Prices available on request



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Standard Biomedical assays

Analyte	Analyte
Arsenic (urine)	Mercury (urine)
Benzene (as S-phenylmercapturic acid (S-PMA)) (urine)	Methylene bis(2-chloroaniline) MbOCA/MOCA (urine)
Bromide (urine/serum)	Methylene Dianiline (MDA) (urine)
Cadmium (blood or urine)	Nickel (urine)
Carbon monoxide (breath - loan of sampler)	Platinum (urine)
Cholinesterase (both plasma and red cell)	Polycyclic aromatic hydrocarbons
Chromium (blood or urine)	Selenium (urine)
Cobalt (urine)	Silver (blood)
Cyanide & other organonitriles (as thiocyanate) (urine)	Solvents Screen (blood, urine, breath)
Dichloromethane (CO (breath) - loan of sampler)	Solvents (blood, urine, breath)
Drugs of Abuse screen (urine)	Styrene (as mandelic acid) (urine)
Onsite testing + confirmation	
Kit + Screen + Confirmation	
Ethylbenzene (as mandelic acid) (urine)	Thallium (urine)
Full Blood Count (blood)	Toluene (as o-Cresol) (urine)
Furfural (as furoic acid) (urine)	Total protein and albumin (urine)
Isocyanates (as diamines) (urine)	Toxic elements - semiquantitative full mass, Al, Cd, Co, Cu, Mn, Ni, Pb, Tl (blood or urine) With Hg or Cr With Hg and Cr
Lead (urine)	Trace Metals (Al, Sb, Cu or Mn, others on request)
Lead, ZPP and Haemoglobin (together)	Vanadium (urine)
Liver Function Test (blood)	Xylene (as methylhippuric acid) (urine)
MEK or MIBK (urine)	Zinc (urine or serum)
Mercury (blood)	

Services in bold are UKAS accredited



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Quarterly and on-request Biomedical assays

Analyte	Analyte
Cytotoxics	
Cyclophosphamide/Ifosphamide (urine/wipe)	Platinum (urine/wipe)
Methotrexate (urine/wipe)	Taxanes (urine/wipe)
	Fluorouracil (urine/wipe)
Pesticides	
Bendiocarb (as 2,2-dimethyl-1,3benzodioxol) (urine)	Organophosphate Pesticides (urine)
Chlorpyrifos (as trichloropyridinol) (urine)	Permethrin /Cypermethrin (as cis-and trans-DCVA and 3-PBA) (urine)
Dithiocarbamates (as ethylenethiourea) (urine)	Pirimicarb (urine)
N-methyl carbamates (e.g. aldicarb) (urine)	Other Pyrethroids (as 3-PBA) (urine)
Miscellaneous	
Aniline, o-Toluidine or p-Toluidine (urine)	Hexane (as hexanedione) (urine)
Butoxyethanol (as butoxyacetic acid) (urine)	N-Methylpyrrolidone (urine)
Carbon disulphide (as thiothiazolidine carboxylic acid, urine)	Naphthalene (as naphthols) (urine)
Colophony/Rosin (as dehydroabiatic acid) (urine)	Nitroglycerin (as total nitroglycols) (urine)
Dimethylacetamide or Dimethylformamide (as NMA or NMF) (urine)	Phenol (urine)
Fluoride (urine)	*Retinol binding protein (urine)
Formaldehyde (as formic acid / formate) (urine)	Trichloroethylene (as trichloroacetic acid) (urine)
Glycol ethers (as alkoxyacetic acids) (urine)	Trimethylbenzene (as dimethylbenzoic acids) (urine)

On Request

Acrylamide (as CEC in urine)
 Beryllium (urine)
 Epoxy resin hardeners (m-XDA, DDHM) (urine)
 Ethylene glycol (urine)
 Hydrazine (urine)
 Hydrogen sulphide (as thiosulphate) (urine)
 Metals (hair, nails, tissue samples)
 Tobacco smoke (as cotinine) (urine or saliva)

Prices available on request

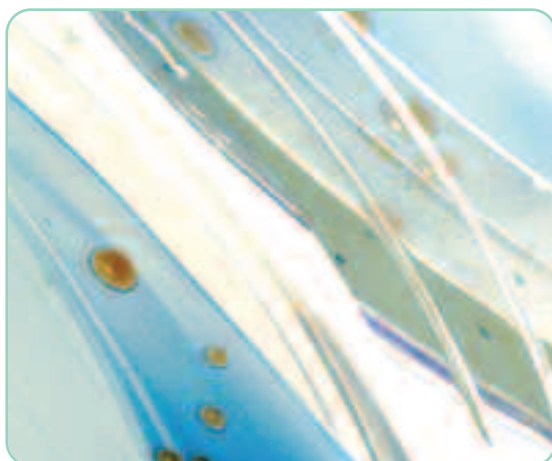
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Microbiological assays

Target	Application
Aerosol testing and RPE penetration tests – pathogenic bacterial surrogates	Health sector; laboratory and biotechnology, agriculture, biosecurity
Anthrax testing (culture and DNA)	Construction sector, agriculture; biosecurity
Bacterial cell count (fluorescence microscopy)	Manufacturing sector, agriculture, food industry, waste recycling
Bacterial counts and culture	Manufacturing sector, agriculture, food industry, waste recycling
Bacteriology: dry residue testing (efficacy of decontamination)	Health sector and laboratory environment
Bacteriology: suspension tests (disinfectant efficacy)	Health sector and laboratory environment
<i>Campylobacter</i> (culture and DNA)	Agriculture, food sector, health sector.
Decontamination efficacy/assessment (bacterial surrogates and fluorescent markers)	Health sector; laboratory and biotechnology, biosecurity
'Dustiness drum' test for microbial aerosolisation	Manufacturing sector, agriculture, food industry, waste recycling
Endotoxin tests	Manufacturing sector, agriculture, food industry, waste recycling
Environmental microbiology (bioremediation): <i>Clostridium</i> , <i>Pseudomonas</i> and sulphate reducing bacteria analyses by culture & DNA	Construction sector, agriculture
Fungal, yeast / mould assays	Manufacturing sector, agriculture, food industry, waste recycling, construction sector, building maintenance & facilities.
Identification of pathogens by DNA methods	All sectors
Legionella tests (DNA)	Building maintenance & facilities
On site sampling (bioaerosol, bulk material and surface sampling)	Manufacturing sector, agriculture, food industry, waste recycling, construction sector, building maintenance & facilities.
verocytotoxic E coli (culture and DNA)	Agriculture, food sector, health sector.
Virology: dry residue testing (efficacy of decontamination)	Health sector and laboratory environment
Virology: suspension tests (disinfectant efficacy)	Health sector and laboratory environment
Virology: isolation & water testing	Health sector; laboratory and biotechnology

Prices available on request



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Aero-allergens and immunology

Target	Examples of sector/application
Bacterial alpha amylase	Food sector, cleaning products
Bacterial subtilisin	Detergent industry, cleaning products
Fungal alpha amylase	Food sector, cleaning products
Fungal glucose oxidase	Food sector
Guinea pig urine	Laboratory animal units
Latex proteins	Healthcare and biomedical industry
Mite allergen (<i>Der p1</i>)	Indoor environments
Mouse m1 allergen	Laboratory animal units
Pancreatic porcine amylase	Leather processing
Rat n1 allergen	Laboratory animal units
Shellfish muscle protein	Seafood industry & food sector
Soya trypsin inhibitor	Agricultural and food sectors
Wheat flour antigen	Food sector (baking)
Cytokine and biomarker assays	Health sector and biomedical research
Specific IgE sera	IgE measurements to a wide range of occupational and environmental allergens

Prices available on request



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Routine Service listings

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