foster+freeman

Instruments for the analysis of

Trace Evidence

Compare & Group Evidence

Identify Unknown Materials

Analyse Chemical Compounds

Characterize a Range of Samples

+ *The* Complete Trace Workstation

providing a range of analytical facilities on a single microscope

Fibres, paint chips, hair, soil, gunshot residues, and minute fragments of glass are just a few examples of trace evidence that may be transferred between people, objects or the environment during a crime.

Once collected and returned to the laboratory, trace evidence may be subjected to a wide array of tests and analysis techniques.

By enabling the examiner to perform multiple examinations, using a single instrument, the Foster + Freeman ffTA has dramatically decreased the time and labour needed for trace analysis.

Modular Design ffTA examination facilities

The core workstation includes a DM2700 microscope connected to a PC to provide a basic microscopy and image processing system.

Additional modules may be added to the core system to provide further functionality.

Available modules include:

1 Optical Multiplexer
2 5MP CCD Camera
3 GRIM3 Video Camera
4 ForamX3 Raman Spectrometer
5 Fluorescent Light Source
6 360° Rotating Stage
7 GRIM3 Hot Stage
8 Incident Illumination Package
9 DM2700 Microscope
10 DM2700 Objectives
11 GRIM3 Processor
12 Microspectrometer Module

ffTA

A MODULAR SYSTEM FOR TRACE EVIDENCE EXAMINATIONS

The ffTA is a powerful and flexible multi-functional system that provides the crime laboratory with a range of analytical facilities on a single microscope operated through a single PC.

Built around a high specification laboratory microscope with LED illumination, the ffTA's modular design enables the user to add functions to meet specific laboratory requirements.

A full ffTA installation provides facilities for the rigorous examination of almost all materials of forensic interest including:

Glass, Paint Chips, Fibres, Drugs, Inks, Cosmetics, Gun Shot Residues, Accelerants & Explosives

UV-Vis-IR Microspectrometry
Non-destructive analysis of organic compounds

GRIM Glass RI Measurement
Analysis and grouping of glass fragments

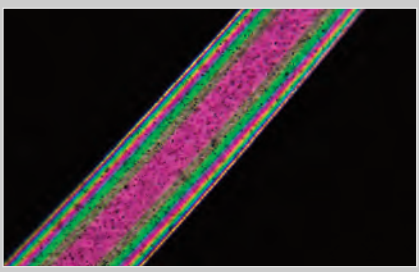
Raman Spectrometry
Analysis of materials including paints, fibres, inks, & drugs

Fluorescence Imaging
Identification of biological samples, chemicals, & drugs

Polarized Light Microscopy
For the examination and identification of fibres

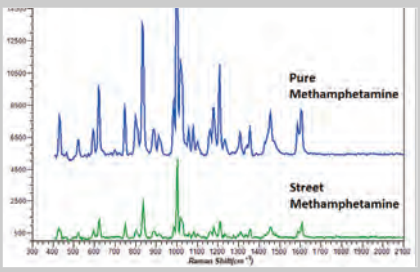
Digital Image Processing
Enhancement & comparison of images

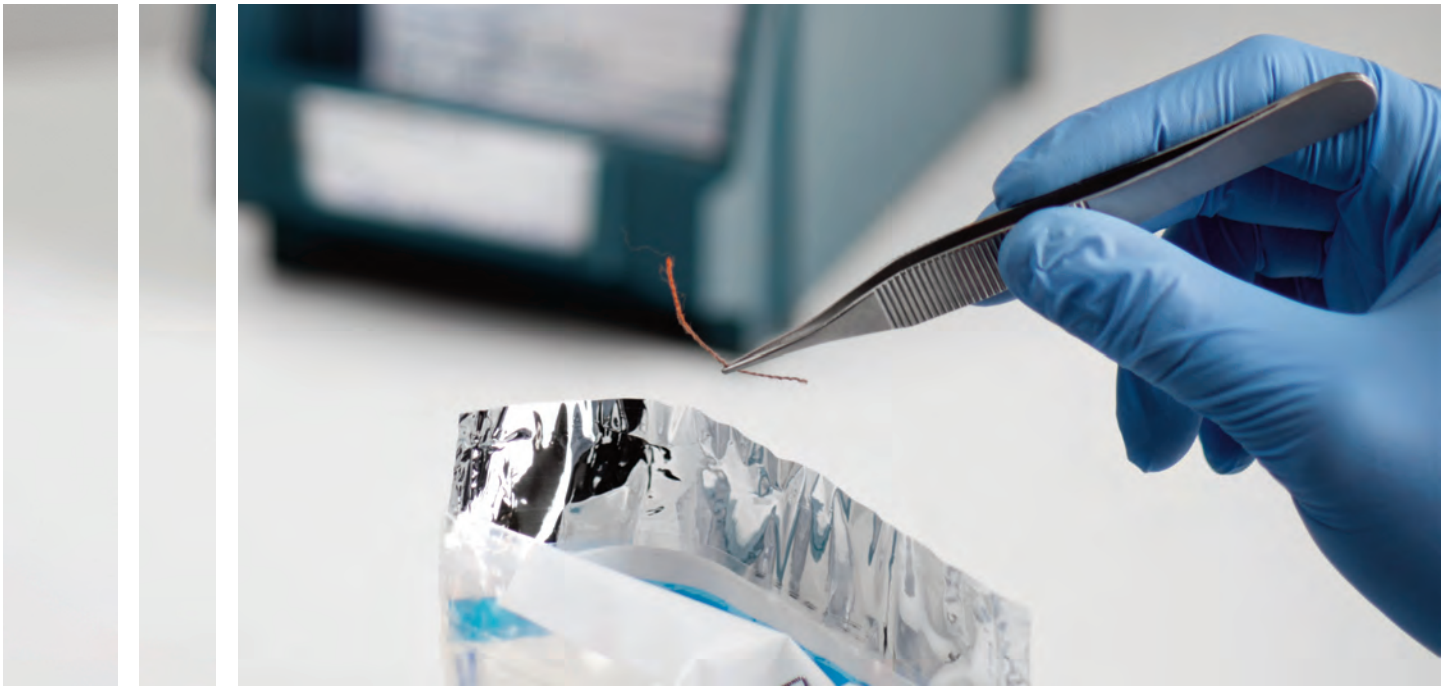
Suspect Fibres
Accurate identification of natural and synthetic fibres using Polarized Light Microscopy.



Glass Fragments
Identify and group glass fragments through the measurement of their refractive indices.

Drugs of Abuse
Analyse the chemical makeup of illicit drugs using Raman spectroscopy





+ Raman Spectroscopy

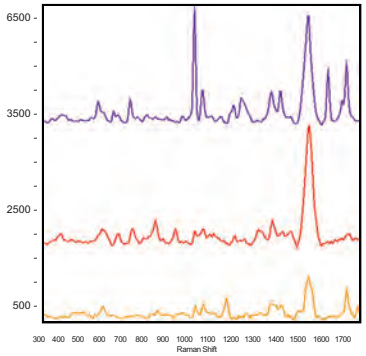
for the comparison and identification of materials

Raman spectroscopy is widely used in forensic science for the study of a variety of organic and inorganic materials including paint chips, fibres, inks, and controlled substances, as well as residues from explosives, flammables and accelerants.

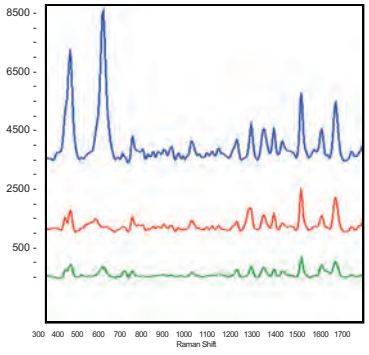
Through the analysis of Raman spectra, specific to molecular structure, this powerful module is able to provide valuable "fingerprints" for comparing, differentiating and identifying materials.

Benefits of Raman include:

- Non-contact, non-destructive analysis
- Analyse materials in solid or liquid form
- Obtain spectra in seconds
- Minimal sample preparation required



Raman analysis of 3 vehicle paints



Raman analysis of 3 lipsticks

Wide Ranging Applications

Raman spectra exhibit valuable "signatures" for comparing and differentiating *all* materials of forensic interest

Provides Rapid Results

Raman analysis typically requires little or no sample preparation. Results are displayed on screen in less than 1 minute

Automatic Spectral Comparison

Foram employs an automatic peak-to-peak correlator that identifies the peaks in two spectra and determines the significance of their match

Automatic Spectral Identification

Identification of samples is made faster and easier through the addition of optional Raman spectra libraries

Foram® 3

685nm & 785nm RAMAN SPECTROMETERS FOR THE ANALYSIS OF FORENSIC EVIDENCE

Compact and easy to use, Foram® 3 instruments offer forensic scientists the full analytical power of Raman, in a choice of laser wavelengths, tailored to meet the specific demands of forensic science.

Operated via laptop or desktop PC, the system provides data archiving and casework management software.

Optional spectra databases aid in the identification of unknown substances.

System features include:

- Record and display Raman spectrum in seconds
- Adjustable laser power protects samples
- A4 size XYZ translation stage
- Integral video microscope for sample selection

Raman spectra databases
for the identification of unknowns

Users of the Foster + Freeman Foram and ffTA Foram X3 module can further enhance the capability of their instruments through the addition of a wide range of Raman databases.

A comprehensive collection of libraries has been compiled by S.T. Japan and formatted for use with the Foram and ffTA systems. In total over 9,000 spectra of common and specialist materials are available divided into 20 categories.

Spectra Libraries include:

- Materials of Forensic Interest
- Alcohols and Phenols
- Dyes, Pigments and Stains
- Fragrances and Cosmetics
- Hazardous Toxic Materials
- Pharmaceuticals and Drugs
- Minerals and Inorganic Materials

+ Elemental Comparison

by Laser Induced Breakdown Spectroscopy

A diagnostic tool to determine the elemental composition of a substance, LIBS has wide ranging applications in forensic examination, in the analysis of trace evidence and questioned documents.

Pulsing a high powered laser onto a sample produces a minute plasma plume which emits a spectrum with peaks characteristic of the elements present.

H																	~~He~~
Li	Be											B	C	N	O	F	~~Ne~~
Na	Mg											Ai	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	~~Kr~~
Rb	Sr	Y	Zr	Nb	Mo	~~Tc~~	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	~~Xe~~
Cs	Ba		Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	~~Pe~~	~~At~~	~~Rn~~
~~Fr~~	~~Ra~~																
		La	Ce	Pr	Nd	~~Pm~~	Sm	Eu	Gd	Tb	Dy	Ho	Re	Tm	Yb	Lu	
		~~Ac~~	~~Th~~	~~Pa~~	~~U~~	~~Np~~	~~Pu~~	~~Am~~	~~Cm~~	~~Bk~~	~~Cf~~	~~Es~~	~~Fm~~	~~Md~~	~~No~~	~~Lr~~	

ECCO currently detectable elements

Almost Unlimited Applications

Requiring no sample preparation, almost any material can be successfully analysed and all common elements identified

Immediate Results

From the moment the ECCO laser is fired, spectral data is collected in under 1 second

High Sensitivity

Capable of identifying trace elements down to concentrations of low PPM, LIBS offers advantages in sensitivity over other processes.

Identification of Elements

A database of emission lines provides automatic identification and labelling of elements present

ECCO®2

FOR THE ELEMENTAL ANALYSIS OF EVIDENCE BY LASER INDUCED BREAKDOWN SPECTROSCOPY

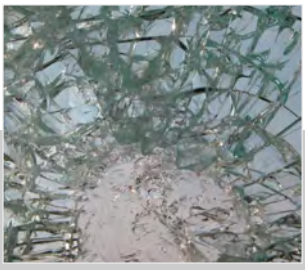
With a large sample chamber, ECCO is designed for the analysis of paper, glass, metals, paint, fibres, minerals and gunshot residues by laser induced breakdown spectroscopy (LIBS) providing elemental analysis on materials as small as 300 microns.

Analysis with ECCO is fast, simple to operate, requires minimal sample preparation, gives immediate results and is sensitive to low parts per million.

LIBS offers significant advantages in speed, sensitivity and cost effectiveness over other processes such as XRF, SEM, & mass spectrometry.

System features include:

- Rapid analysis
- Automatic identification of elements
- Minimal sample preparation
- Minimal technical training required
- Safety interlocked sample chamber



Glass Fragments

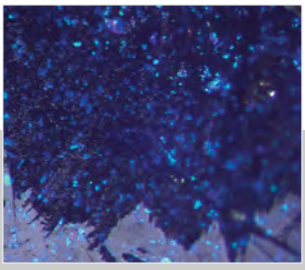
LIBS can be used to identify many of the main elements present in glass and is often effective in discriminating between glasses which cannot be separated by refractive index.

Explosives

The accurate identification & characterisation of explosives and gunshot residues has, in the past, been a costly and time consuming process. Today, LIBS provides a rapid screening technique to aid investigations

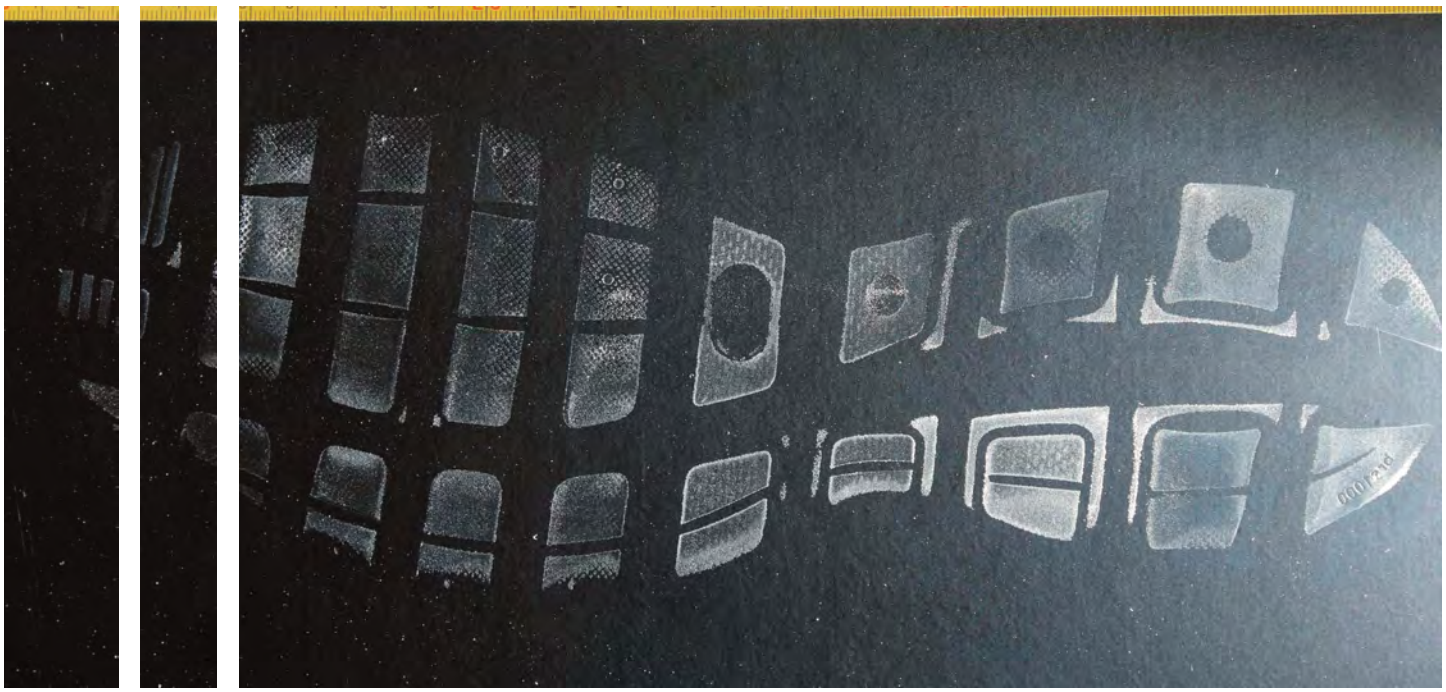
Illicit Drugs

Identification of chemicals recovered from suspect or clandestine laboratories can provide useful evidence in proving illicit drug manufacture.



Paint Chips

Elemental analysis of visually identical paint chips or smudges can quickly reveal differences in composition.



+ Shoe Prints

Identify the make and model of a shoe from its full or partial print

Footwear marks located at the crime scene can provide excellent collaborative evidence when building a criminal case.

Using either SICAR 6 of SoleMate FPX to interrogate the SoleMate database, the make and model of an item of footwear can be identified by the print it creates.

Using the information contained within the SoleMate database, it may be possible to identify suspects and establish links between crimes.

Low-angle white light surface illumination using the Crime-lite 82L, is a helpful technique for imaging shoe prints in dust.

Simple, Effective Searching

A simple 'visual coding' system enables the operator to identify footwear by searching against the shapes seen within a shoe print

Extensive Reference Library

Updated 4x per year, SoleMate® is the world's most comprehensive individually coded forensic footwear database

Full Casework Management

SICAR 6 is a total evidence management system in which records may be created, searched against, & outputted in report format

Link Suspects to Crimes

Once a suspect print has been identified, the information can be used to establish links between crimes and suspects

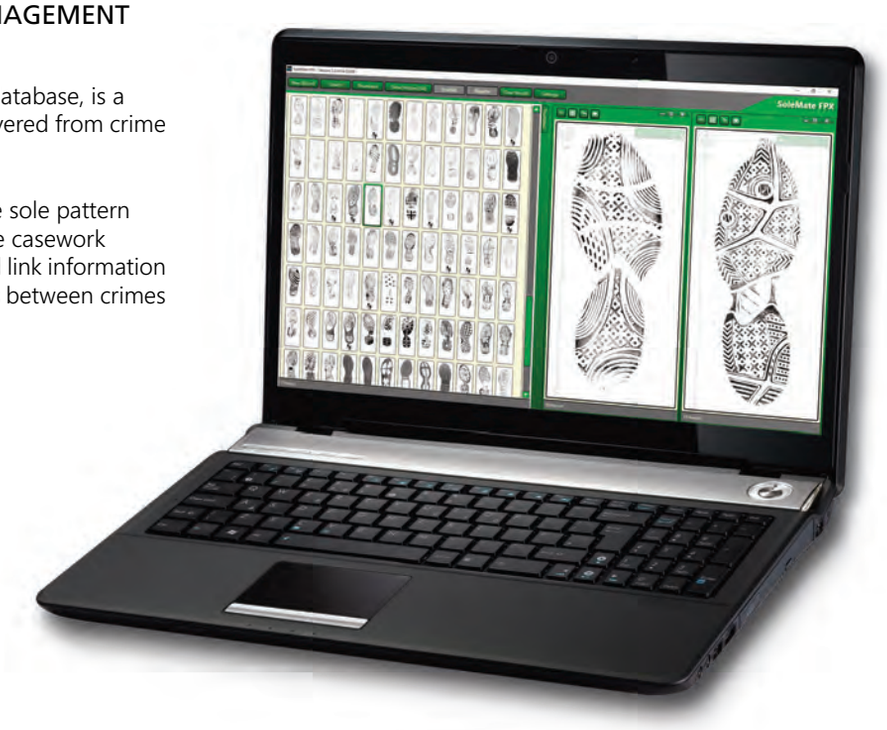
SoleMate® FPX

SHOE PRINT IDENTIFICATION & CASEWORK MANAGEMENT

SoleMateFPX, in conjunction with the SoleMate footwear database, is a complete solution for the identification of shoe prints recovered from crime scenes.

Having searched for and identified suspect prints using the sole pattern coding technique, SoleMate FPX provides a comprehensive casework management system that allows the operator to record and link information to produce effective court reports or establish connections between crimes and suspects.

- ▶ Comprehensive shoe print intelligence tool
- ▶ Identify full and partial shoe prints
- ▶ Extensive footwear reference database



SoleMate® FOOTWEAR REFERENCE DATABASE

The SoleMate database contains details of more than 33,000 items of footwear including sample shoe prints.

Each footwear record includes a selection of images and sole prints together with detailed information including footwear type, brand, model, and date of manufacture.

Updated four times per year with information and images of the latest sports, work and casual footwear from all major brands, SoleMate provides users with the ability to identify shoe prints from crime scenes

Searching the SoleMate Database: Sole Pattern Coding

Searching the SoleMate database to identify the make and model of footwear responsible for creating a suspect shoe print is quick and easy thanks to a unique method of 'sole pattern coding'.

Using SoleMate FPX to conduct the search, the operator builds an on-screen representation of the suspect print using a selection of shapes, text and logos.

The software then searches the database, using the sole pattern criteria, to return a list of the most visually similar shoeprints.

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