

# A Matter of Interpretation



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They are a rare commodity in the UK forensic field; experts who are specialised in the recovery and identification of gunshot residue (GSR). The majority began their careers at the Forensic Science Service (FSS) and underwent at least four years training before being able to report the full range of gun crime casework that was submitted to the laboratory. The number of experts active in the discipline in the UK can now be counted on two hands and are employed either by commercial forensic providers or work as independent forensic consultants.

One such independent consultancy is the Forensic Firearms Consultancy (FFC) Ltd that was set up in April 2012 by the two most senior FSS gun crime scientists [www.forensicfirearmsconsultancy.com](http://www.forensicfirearmsconsultancy.com). These scientists have over 35 years experience. FFC works primarily, but not exclusively, for the defence and has prepared numerous reports and provided expert testimony in GSR cases across the globe.

When a gun is fired thousands of microscopic particles, called gunshot residue, are produced by the ammunition. They are emitted from the end of the barrel of a gun and from any gaps or openings in the gun's action and can be deposited on the firer, any persons sufficiently close to the

firer, and the gun itself. The recovery and identification of GSR can help address questions such as, "has the suspect fired a gun?" GSR is not a conclusive evidence type such as DNA or fingerprints. It is a corroborative evidence type however; the usefulness of GSR should not be underestimated as its presence or absence in the most serious of crimes, those involving firearms, can be crucial to the overall strength of evidence when a case comes to trial.

It is rarely contested that GSR originates from a firearm. What is of far more interest is how the particles came to be present on a suspects clothing, skin or hair. This can only be evaluated within the full circumstances of the case taking into account both the prosecution and defence hypothesis and any comments the defendant may have said in mitigation. The type of firearm and ammunition used in the crime is also important information to the GSR expert as it can have an impact on the amount of GSR that may be deposited onto the suspect or their surroundings. This makes FFC unique in that we have nearly four decades experience in firearms related forensic science and can undertake both the firearms and GSR aspects of a case unlike any other firearms consultancy. GSR is one of the most heavily scrutinised trace evidence types in

criminal investigations and the expert must ensure that solicitors, barristers and ultimately the court understand the strength of the evidence. With any trace evidence the possibility of cross-contamination should always be uppermost in the mind. GSR is rare in the general environment and the expectation is that one would not expect it to be present on a suspect with no connection to firearms. However, studies in the UK have discovered that single particles can be found, albeit infrequently, on public transport.

In cases where multiple shots have been fired, a not too uncommon scenario in today's world, the discharge of different types of ammunition within a firearm can produce a rather unique 'hybrid' of GSR. There are approximately five common types of GSR that are seen in firearms crime and the scientist will compare any GSR found on the suspect with that present within the crime gun or ammunition. In instances where different types of ammunition have been fired there will be a mixing of the GSR types producing a 'hybrid' GSR type. This will be deposited within the gun barrel, on to the firers' hands and clothing and ultimately on to the victim or object being fired at. Finding a 'hybrid' GSR type on a suspect and within the crime gun can produce stronger evidence

than if one of the five common types of GSR had been found thus providing support that they had been exposed to the discharge of the crime gun.

In firearms incidents involving vehicles GSR can be found either within the vehicle or on items recovered from the vehicle for example clothing. On the surface of it this could provide a link to the incident however, this would depend on the history of the items before they were placed into the vehicle and if GSR was already present within the vehicle thus contaminating the items. The interpretation of GSR in any such cases is complex and should be carried out by highly experienced experts knowledgeable in the full facets of the evidence type. FFC scientists are fully versed in all aspects of the interpretation of gun crime cases and continue to raise scientific standards with regards to firearms related forensic science within the UK and worldwide. ■



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#### FFC offers bespoke, customer-led solutions to all firearms and GSR-related investigations.

Forensic Firearms Consultancy (FFC) Ltd is an innovative company led by two world-renowned experts. During their time at the UK Forensic Science Service (FSS), Mark Mastaglio and Angela Shaw became the most senior scientists working in forensic firearms and gunshot residue (GSR) respectively. It is the only UK-based private consultancy offering this level of expertise, experience and worldwide reputation in firearms and GSR. FFC can undertake work at every level of forensic firearms and GSR examinations and has extensive experience of complex, sensitive cases from across the globe.

The FFC directors are two of the most senior and experienced practitioners in the UK, with over 35 years of firearms and GSR court reporting experience.

FFC's Expert Witness service includes:

- ❖ Examination of the full range of cases, from the alleged illegal possession of firearms and ammunition to complex interpretation of fatal shooting incidents
- ❖ In-depth knowledge of firearms legislation involving complex classification issues – an insider's knowledge of firearms law policy
- ❖ Civil or criminal case investigation
- ❖ Court attendance
- ❖ Potential for accidental discharge
- ❖ Trajectory reconstruction analysis, including scene visits
- ❖ Determination of the type of gun used
- ❖ Determination of how many guns used
- ❖ Range of fire determination
- ❖ Interpretation of autopsy findings, including autopsy examination attendance
- ❖ Interpretation of GSR findings (incorporating SEM-EDX results)
- ❖ Critical analysis of GSR contamination issues

If you need immediate advice, please contact either **Mark Mastaglio** on +44 7919 217 848 or **Angela Shaw** on +44 7919 392 397. Otherwise please email us at: [enquiries@forensicfirearmsconsultancy.com](mailto:enquiries@forensicfirearmsconsultancy.com). Our website is at: [www.forensicfirearmsconsultancy.com](http://www.forensicfirearmsconsultancy.com)

