B87 A Study of the Trace Evidence Aspects of Partially Burned Gunpowder Particles and the Adaptation of SWG-MAT Trace Evidence Recovery Guidelines for the Analysis of Gunpowder Residues on Clothing

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After attending this presentation, attendees will better understand how to use trace evidence recovery techniques for extracting gunpowder residues from clothing, and will have a better understanding of the various morphological & flight characteristics of partially burned gunpowder particles and particle fragments. Case examples will be given.

This presentation will impact the forensic community and/or humanity by providing a better understanding of the use of trace evidence recovery techniques for extracting gunpowder residues from clothing, and will have a better understanding of the various morphological & flight characteristics of partially burned gunpowder particles and particle fragments. This will lead to more accurate determinations of distance involving casework.

Objectives: Current methods for the analysis of gunshot residue particles on clothing rely on visual examination followed by chemical testing. In this paper, the use of SWG-MAT trace evidence recovery guidelines, as an adjunct test to current methods, to further recover essentially all gunshot residue particles embedded from all surfaces of the clothing will be outlined. This information can be critical in certain types of shooting cases (to be discussed) to answer issues of the distance involved in the shooting. Several case studies from prior casework employing these techniques will be discussed.

Methodology: After the use of current visual examination techniques and chemical testing for gunshot residues is concluded, the clothing items are examined using a variety of trace evidence techniques such as tape lifts, scraping techniques and vacuuming techniques. The resultant debris isolated from the clothing may contain numerous microscopic particles of gunshot residue which can be examined by various methods which will be discussed. Various common forms of trace evidence debris normally isolated from gunshot residues will be outlined, and the ranges to which some of this debris may be encountered following the discharge of a firearm will be discussed.

Results: Trace evidence analysis of the gunshot residue debris encountered from the firing of a firearm may allow in certain cases for a further characterization & determination of the range(s) at which a firearm was fired. In certain types of shooting case scenarios, such information can be crucial to the solving of the case.

Conclusions: Trace evidence analysis of the gunshot residue debris encountered from the firing of a firearm is not a technique which should be used in every type of shooting case, but it is a technique which can be used in certain types (to be discussed) which can lead to valuable or critical information which may be useful to the solving of a case.

Gunpowder, GSR, Trace Evidence

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