

Gunshot Residue Analysis by Scanning Electron Microscopy/Energy Dispersive X-Ray Spectrometry



WHAT IS AN AAFS STANDARD FACTSHEET?

The AAFS produces clear, concise, and easy-to-understand factsheets to summarize the contents of technical and professional forensic science standards on the OSAC Registry. They are not intended to provide an interpretation for any portion of a published standard.

WHAT IS THE PURPOSE OF THIS STANDARD?

This standard practice describes recommendations for the automated analysis of primer residue by scanning electron microscopy with energy dispersive x-ray spectrometry (SEM-EDS).

This standard outlines requirements and recommendations for sample preparation, instrument capabilities, analysis setup, quality assurance and calibration, data analysis, and documentation

This standard also provides definitions for terms commonly used in the primer residue analysis field as well as important references for this type of analysis.

WHY IS THIS STANDARD IMPORTANT? WHAT ARE ITS BENEFITS?

Adherence to this standard practice promotes proper sample handling and preparation as well as use of an instrument capable of accurately performing this type of analysis. Additionally, this standard outlines requirements for quality assurance and documentation.

Forensic science service providers (FSSP) adhering to this standard can be confident their testing methodology is sound and represents what is currently accepted in the field.



HOW IS THIS STANDARD USED, AND WHAT ARE THE KEY ELEMENTS?

SEM/EDS analysis of gunshot residue is a non-destructive method that provides both morphological information and the constituent elements detected in individual particles.

For each step of the analysis, the standard sets out what is minimally required as well as how these requirements can be met by the forensic science service provider. This allows the user to easily evaluate their process and address deficiencies as needed. These requirements and the discussion of how they can be met are included for sample preparation, instrument capabilities and setup, automated sample analysis, quality assurance, data analysis, and documentation of results.

This standard includes definitions for frequently used terminology related to primer residue testing. Related ASTM standards are referenced to assist the user with general forensic practices for training and analysis. Several additional references are included to support the recommendations and requirements set out in the standard and assist the user with understanding primer residue formation, deposition, collection, and analysis.

Additional practices, procedures, and documentation beyond the requirements in this standard may be needed in specific situations or to meet individual FSSP requirements for quality assurance.

