FACTSHEET FOR STANDARD GUIDE ANSI/ASTM E2228-23a

Microscopical Examination of Textile Fibers

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 guide describes procedures for the microscopical examinations employed in forensic fiber classification, identification, and comparison.

Examining fibers microscopically allows the examiner to determine a fiber's polymer type and to compare questioned fibers to known fibers to determine if they exhibit the same microscopic characteristics and optical properties.

Examination of fibers by microscopy includes the use of a variety of light microscopes and illumination types. The particular test(s) or techniques employed by each examiner or forensic science service provider (FSSP) depends upon available equipment, examiner training, and the nature and extent of the fiber evidence.

WHY IS THIS STANDARD IMPORTANT? WHAT ARE ITS BENEFITS?

This standard is intended to assist forensic fiber examiners in the classification, identification, and comparison of textile fiber evidence. The microscopical examination of textile fibers is generally a non-destructive, rapid, and reproducible means of determining the microscopic characteristics, optical properties, and generic polymer type of textile fibers.

For determining if two or more fibers can be differentiated, side-by-side microscopical comparisons provide a highly discriminating and efficient method.

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

Sections in this standard include sample handling, equipment performance verification, analysis, classification and identification, microscopical fiber comparison, interpretation and conclusions, and examination documentation.

- Sample handling - Visual inspection of the item, removal of fibers of interest, and microscopical isolation of fibers for further analysis are covered. All are done in a way to ensure contamination does not occur.
- Equipment performance verification - Balanced and matched bases in a comparison microscope are discussed.
- Analysis - A preliminary fiber examination using a stereomicroscope and recommendations for characterizing a fiber's optical and physical characteristics – color, refractive index, diameter, cross-section, delusterant/pigment/filler particles, surface striations/damage/debris, fluorescence, etc., are covered.
- Classification and identification – A variety of techniques/instrumentation are listed, depending on the generic fiber type (e.g., manufactured, glass, natural, animal).
- Comparison – Procedures for comparing questioned to known or questioned to questioned samples are included.
- Interpretation and conclusions for microscopical comparisons – These are based upon observations made on similarly prepared samples.
- Examination documentation - Requirements for case notes are addressed.

American Academy of Forensic Sciences
aafs.org

This factsheet is made possible through the following financial assistance award 70NANB21H097 awarded to AAFS from U.S. Department of Commerce, National Institute of Standards and Technology