

## Static Headspace Sampling of Vapors from Fire Debris Samples



### 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 practice describes the procedure for removing a vapor sample from the headspace of a fire debris container for the purpose of detecting or identifying ignitable liquid residues.

This practice is most applicable for sampling light to medium-range ignitable liquids. This technique is not a concentration technique; therefore, it is not capable of sufficiently recovering heavy-range ignitable liquids.

Screening of fire debris samples using this technique is part of a general scheme for the analysis of ignitable liquids and ignitable liquid residues described in [ANSI/ASTM E3245-20e1](#).

Preservation is not possible with this sampling technique.

### WHY IS THIS STANDARD IMPORTANT? WHAT ARE ITS BENEFITS?

During a fire investigation, materials suspected of containing ignitable liquid residues can be collected and submitted for further analysis. Static headspace sampling is one method used by a forensic science service provider (FSSP) to extract ignitable liquid residues that may be present. Static headspace sampling allows the evidence to remain in approximately the same condition as received. Unlike some other methods of separation and concentration, this practice allows for resampling and reanalysis.

The instructions provided in this standard aim to bring consistency to this sampling technique when utilized by FSSPs.



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

This standard describes the procedural requirements for static headspace sampling, a technique to sample vapor residues of ignitable liquids that may be present in fire debris evidence submitted to FSSPs.

This standard delineates requirements for both sampling preparation and for the sampling procedure. Generally, the procedure is performed by withdrawing the headspace vapor sample from the original evidence container, but some evidence types, such as liquids, may be transferred to vials or other containers prior to sampling.

The product of this procedure is a headspace sample that can be screened using GC-FID or analyzed using GC-MS in accordance with ANSI/ASTM E1618-19. Headspace sampling techniques are also used prior to extraction with other techniques, such as those described in Practices ANSI/ASTM E1386-23, [E1412-19](#), [E1413-19](#), [E2154-15a](#), and [E3189-19](#).

Requirements related to evidence handling, documentation, quality assurance, and quality control are covered by required conformance to ANSI/ASTM E1459-24, E1492-11(2017), and [E3255-21](#).