



Standard Practice for Static Headspace Sampling of Vapors from Fire Debris Samples¹

This standard is issued under the fixed designation E1388; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

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

1.2 Separation and concentration procedures are listed in the referenced documents. (See Practices E1386, E1412, E1413, and E2154.)

1.3 This practice offers a set of instructions for performing one or more specific operations. This standard cannot replace knowledge, skill, or ability acquired through appropriate education, training, and experience and should be used in conjunction with sound professional judgment.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

E1386 Practice for Separation of Ignitable Liquid Residues from Fire Debris Samples by Solvent Extraction

E1412 Practice for Separation of Ignitable Liquid Residues

¹ This practice is under the jurisdiction of ASTM Committee E30 on Forensic Sciences and is the direct responsibility of Subcommittee E30.01 on Criminalistics. Current edition approved July 15, 2017. Published July 2017. Originally approved in 1990. Last previous edition approved in 2012 as E1388 – 12. DOI: 10.1520/E1388-17.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

from Fire Debris Samples by Passive Headspace Concentration with Activated Charcoal

E1413 Practice for Separation of Ignitable Liquid Residues from Fire Debris Samples by Dynamic Headspace Concentration onto an Adsorbent Tube

E1459 Guide for Physical Evidence Labeling and Related Documentation

E1492 Practice for Receiving, Documenting, Storing, and Retrieving Evidence in a Forensic Science Laboratory

E1618 Test Method for Ignitable Liquid Residues in Extracts from Fire Debris Samples by Gas Chromatography-Mass Spectrometry

E2154 Practice for Separation and Concentration of Ignitable Liquid Residues from Fire Debris Samples by Passive Headspace Concentration with Solid Phase Microextraction (SPME)

E2451 Practice for Preserving Ignitable Liquids and Ignitable Liquid Residue Extracts from Fire Debris Samples

3. Summary of Practice

3.1 The headspace of an item is sampled, preferably in its original container, for analysis by an appropriate technique (for example, gas chromatography-mass spectrometry). The container may be heated prior to sampling to increase the volatility of any ignitable liquid residues.

4. Significance and Use

4.1 This practice is useful for sampling fire debris to screen for the presence of ignitable liquid residues prior to extraction with other techniques. It is most appropriate for sampling light to medium range ignitable liquids (such as light oxygenates, lacquer thinners, and other similar volatile compounds or products), and less appropriate for sampling ignitable liquids that have compounds in the heavy range.^{3, 4, 5}

4.1.1 When sampled for screening purposes, the instrumentation typically utilized is a gas chromatograph with either a

³ Ettling, B. V., and Adams, M. F., "The Study of Accelerant Residues in Fire Remains," *Journal of Forensic Sciences*, Vol 13, No. 1, 1968, pp. 76–89.

⁴ Stauffer, E., Dolan, J. A., and Newman, R., *Fire Debris Analysis*, Boston, MA: Academic Press, 2008.

⁵ Hinshaw, J. V., "Headspace Sampling," *LCGC Europe*, Vol 24, No. 10, 2011.