



## Standard Practice for Sampling of Headspace Vapors from Fire Debris Samples<sup>1</sup>

This standard is issued under the fixed designation E 1388; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This practice covers the procedure for removing small quantities of ignitable liquid residue from samples of fire debris by sampling the headspace of the debris container.

1.2 Separation and concentration procedures are listed in the referenced documents. (See Practices E 1385, E 1386, E 1412, and E 1413.)

1.3 *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.*

### 2. Referenced Documents

#### 2.1 ASTM Standards:

E 1385 Practice for Separation and Concentration of Ignitable Liquid Residues from Fire Debris Samples by Steam Distillation<sup>2</sup>

E 1386 Practice for Separation and Concentration of Ignitable Liquid Residues from Fire Debris Samples by Solvent Extraction<sup>2</sup>

E 1387 Test Method for Ignitable Liquid Residues in Extracts from Samples of Fire Debris by Gas Chromatography<sup>2</sup>

E 1412 Practice for Separation and Concentration of Ignitable Liquid Residues from Fire Debris Samples by Passive Headspace Concentration<sup>2</sup>

E 1413 Practice for Separation and Concentration of Ignitable Liquid Residues from Fire Debris Samples by Dynamic Headspace Concentration<sup>2</sup>

E 1492 Practice for Receiving, Documenting, Storing, and Retrieving Evidence in a Forensic Science Laboratory<sup>2</sup>

E 1618 Guide for Ignitable Liquid Residues in Extracts from Fire Debris Samples by Gas Chromatography-Mass Spectrometry<sup>2</sup>

### 3. Summary of Practice

3.1 The sample, preferably in its original container, is heated in order to volatilize any petroleum products present in the debris. After heating, the headspace is sampled and

analyzed by gas chromatography, GC/MS, or GC/IR.

### 4. Significance and Use

4.1 This practice is useful for screening samples for the presence of a particular type of petroleum product.

4.2 This practice is useful when volatile oxygenated products such as alcohols or lacquer thinners are suspected.

4.3 This practice is the least sensitive of the sample preparation techniques and may not detect quantities of less than 10  $\mu$ L of petroleum product.

4.4 Because this separation takes place in a closed container, the sample remains in approximately the same condition in which it was submitted. Repeat and interlaboratory analyses are therefore possible.

4.5 Due to variables in the debris sample condition prior to headspace sampling, complete reproducibility of chromatograms may be difficult to obtain.

4.6 To obtain greater reproducibility, use one of the separation procedures which results in a solution of the flammable or combustible liquid residue (see Practices E 1385, E 1386, E 1412, and E 1413)

### 5. Apparatus

5.1 *Heating System*—An oven or a heating mantle to fit the evidence container, or a hot plate.

5.2 *Temperature Measuring Device*—A thermometer or thermocouple capable of measuring temperatures in the range from 40 to 150°C.

5.3 A gas-tight syringe capable of reproducibility introducing sample sizes in the range from 0.5 to 5 mL.

5.4 A drill or punch, to puncture holes in container lids.

### 6. Sample Preparation

6.1 Observe the appropriate procedures for handling and documentation of all submitted samples as described in Practice E 1492.

6.1.1 Open and examine the fire debris sample in order to determine that it is consistent with its description.

6.1.1.1 Resolve any discrepancies between the submitting agent's description of the evidence and the analyst's observation with the submitting agent prior to the completion of the report.

6.2 Punch or drill a small hole in the container lid and cover the hole with tape.

6.2.1 Alternatively, a rubber sleeve stopper may be placed in the hole.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 14.02.