



Standard Test Method for Determination of Asphalt Fume Particulate Matter in Workplace Atmospheres as Benzene Soluble Fraction¹

This standard is issued under the fixed designation D 6494; 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 test method covers the determination of asphalt fume particulate matter (as benzene soluble fraction) and total particulate matter weight in workplace atmospheres using a polytetrafluoroethylene (PTFE) filter methodology.

1.2 This procedure has been adapted from NIOSH Method 5023 (withdrawn prior to 4th edition (1994) and replaced in 1998 with NIOSH Method 5042) and OSHA Method 58 to reduce the level of background contamination providing better reproducibility.

1.3 This procedure is compatible with high flow rate personal sampling equipment—0.5 to 2.0 L/min. It can be used for personnel or area monitoring.

1.4 The sampling method develops a time-weighted average (TWA) sample and can be used to determine short-term exposure limit (STEL).

1.5 The applicable concentration range for the TWA sample is from 0.2 to 2.0 mg/m³.

1.6 *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.* For more specific precautionary statements, see Section 9.

2. Referenced Documents

2.1 ASTM Standards:

D 1356 Terminology Relating to Sampling and Analysis of Atmospheres²

2.2 Occupational Safety and Health Administration (OSHA) Methods³

OSHA 58 Coal Tar Pitch Volatiles

2.3 National Institute of Occupational Safety and Health (NIOSH) Methods⁴

NIOSH 5023 Coal Tar Pitch Volatiles

NIOSH 5042 Benzene —Soluble Fraction and Total Particulate (Asphalt Fume)

3. Terminology

3.1 Definitions:

3.1.1 *asphalt fume particulate matter*—particulate matter generated during the processing of hot asphalt.

3.1.2 For definitions of terms relating to this test method, refer to Terminology D 1356.

4. Summary of Test Method

4.1 A known volume of sample air is passed through a PTFE filter. Asphalt fumes are removed from the air stream by deposition on the filter.

4.2 The asphalt fume is extracted with a known volume of benzene. The benzene extract is then evaporated to dryness in a vacuum oven. The benzene soluble fraction (BSF) is then determined gravimetrically.

5. Significance and Use

5.1 Asphalt is a material used in the construction of roads and as a roofing material and sealant.

5.2 This test method provides a means of evaluating exposure to asphalt fume in the working environment at the presently recommended exposure guidelines.

5.2.1 The threshold limit value (TLV) for asphalt (petroleum) fumes is 5 mg/m³ 8-h TWA, (1998 Threshold Limit Values and Biological Exposure Indices, ACGIH⁵).

5.3 This procedure has been adapted from NIOSH Method 5023 (withdrawn prior to 4th edition (1994) and replaced in 1998 with NIOSH Method 5042) and OSHA Method 58 to reduce the level of background contamination providing better reproducibility.

6. Interferences

6.1 All materials (not just asphalt fume) collected that are soluble in benzene will be included in the benzene soluble fraction weight.

6.2 Changes in temperature or humidity during pre- and post-collection weighing may affect accuracy.

¹ This test method is under the jurisdiction of ASTM Committee D-22 on Sampling and Analysis of Atmospheres and is the direct responsibility of Committee D22.04 on Workplace Atmospheres.

² *Annual Book of ASTM Standards*, Vol 11.03.

³ Available from Occupational Safety and Health Administration, Salt Lake Technical Ctr., 1781 S. 300 W., Salt Lake City, UT 84115.

⁴ Available from National Institute of Occupational Safety and Health, Cincinnati, OH.

⁵ Available from American Conference of Government Industrial Hygienists, 1014 Broadway, Cincinnati, OH 45202.