



Designation: D 5368 – 93

Standard Test Methods for Gravimetric Determination of Total Solvent Extractable Content (TSEC) of Solid Waste Samples¹

This standard is issued under the fixed designation D 5368; 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 These test methods describe standard procedures for gravimetrically determining the total nonvolatile and semi-volatile organic content of solvent extracts from soils or solid wastes. The following methods are included:

	Section
Method A—Micro-Determination of TSEC	11-13
Method B—Evaporating Dish Procedure	14-16
Method C—Boiling Flask Procedure	17-19

1.2 These methods are used after a solvent extract is obtained from a soil or solid waste. For these methods to be applicable, the extraction solvent must have a boiling point less than that of water at ambient pressure.

1.3 The total solvent extractable content (TSEC) of a soil, sediment, sludge, or solid waste depends upon the solvent and method used for the extraction procedure.

2. Referenced Documents

2.1 ASTM Standards:

- D 2109 Test Methods for Nonvolatile Matter in Halogenated Organic Solvents and Their Admixtures²
- D 2910 Practice for Concentration and Recovery of Organic Matter from Water by Activated Carbon³
- D 3086 Test Method for Organochlorine Pesticides in Water³
- D 3445 Test Method for Nonvolatile Matter in Trichlorotrifluoroethane⁴
- D 3694 Practices for Preparation of Sample Containers and for Preservation of Organic Constituents³
- D 4281 Test Method for Oil and Grease (Fluorocarbon Extractable Substances) by Gravimetric Determination³
- D 5369 Practice for the Extraction of Solid Waste Samples for Chemical Analysis Using Soxhlet Extraction⁵

3. Terminology

3.1 Definition:

¹ These test methods are under the jurisdiction of ASTM Committee D34 on Waste Management and are the direct responsibility of Subcommittee D34.01.06 on Analytical Methods.

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² Annual Book of ASTM Standards, Vol 15.05.

³ Annual Book of ASTM Standards, Vol 11.02.

⁴ Discontinued 1991; Replaced by Test Methods D 2109, Annual Book of ASTM Standards, Vol 15.05.

⁵ Annual Book of ASTM Standards, Vol 11.04.

3.1.1 *total solvent extractable content (TSEC)*—the total concentration by weight (w/w) of organic materials that is extractable from a soil or solid waste by the selected solvent.

4. Summary of Methods

4.1 The sample is extracted with an organic solvent using a procedure such as described in Practices D 5369 (Soxhlet Extraction) or Test Method D 4281. The quantity of material extracted into the solvent is determined as the residue weight after solvent evaporation. Similar ASTM methods are Test Methods D 2109 and D 3445, and Practice D 2910.

4.1.1 *Method A, Micro-Determination Method*—The residue weight after solvent evaporation is determined for 200 µL of solvent extract evaporated on an aluminum weighing dish. A heat lamp is used to effect evaporation.

4.1.2 *Method B, Evaporating Dish Procedure*—The residue weight after solvent evaporation is determined for 1.0 to 75.0 mL of solvent extract. Solvent is evaporated in an evaporating dish by heating at 5°C below the solvent boiling point. A stream of nitrogen over the surface of the solvent is used to accelerate evaporation.

4.1.3 *Method C, Boiling Flask Method*—The residue weight after solvent evaporation is determined for 100 to 300 mL of solvent evaporated in a boiling flask. Solvent is evaporated in a water bath at the solvent boiling point.

5. Significance and Use

5.1 The TSEC provides a quantitative measure of the total solvent extractable organic content of the solid waste in question. Based upon the TSEC, the extract may be analyzed or further processed (that is, further cleanup or solvent concentration) in preparation for analysis. Thus, the TSEC provides a quantitative measure for optimizing the extractable organic concentration prior to chemical analysis.

5.2 The TSEC of soil or waste material may be used as a quantitative measure for the screening and selection of samples for chemical analysis.

5.3 The TSEC may be useful as a simple and relatively inexpensive quantitative indicator of changes occurring in the total extractable organic content of soil or waste materials.

5.4 The detection limit of the TSEC depends upon the specific procedures employed. Typical detection limits in solvent extracts (that is, without solvent pre-concentration) for Method A are more than 1000 µg/g. For Method B typical