



Standard Test Method for Determination of Bisphenol A in Soil, Sludge and Biosolids by Pressurized Fluid Extraction and Analyzed by Liquid Chromatography/Tandem Mass Spectrometry¹

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1. Scope

1.1 This procedure covers the determination of Bisphenol A (BPA) in soil, sludge, and biosolids. This test method is based upon solvent extraction of a soil matrix by pressurized fluid extraction (PFE). The extract is filtered and analyzed by liquid chromatography/tandem mass spectrometry (LC/MS/MS). BPA is qualitatively and quantitatively determined by this test method.

1.2 *Units*—The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 The Method Detection Limit² (MDL), electrospray ionization (ESI) mode, and Reporting Range³ for BPA are listed in [Table 1](#).

1.4 *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:⁴

D653 [Terminology Relating to Soil, Rock, and Contained Fluids](#)

D1193 [Specification for Reagent Water](#)

D3694 [Practices for Preparation of Sample Containers and for Preservation of Organic Constituents](#)

D3740 [Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction](#)

D3856 [Guide for Management Systems in Laboratories Engaged in Analysis of Water](#)

D5681 [Terminology for Waste and Waste Management](#)

E2554 [Practice for Estimating and Monitoring the Uncertainty of Test Results of a Test Method Using Control Chart Techniques](#)

2.2 Other Documents:

EPA Publication SW-846 [Test Methods for Evaluating Solid Waste, Physical/Chemical Methods](#)⁵

The Code of Federal Regulations 40 CFR Part 136, [Appendix B](#)⁶

3. Terminology

3.1 Definitions:

3.1.1 *Bisphenol A (BPA)*, *n*—2,2-bis(4-hydroxyphenyl) propane.

3.1.2 *Bisphenol A (propane-D₆) (BPA-D₆)*, *n*—deuterium labeled Bisphenol A where the two methyl moieties contain all ²H and is used as a surrogate in this method.

3.1.3 *filter unit*, *n*—in this test method, a filter that is supported with a housing that is inert to the solvents used as described in [7.4](#) of this test method.

3.1.4 *filtration device*, *n*—a device used to remove particles from the extract that may clog the liquid chromatography system as described in [7.4](#) of this test method.

3.1.5 *glass fiber filter*, *n*—a porous glass fiber material onto which solid particles present in the extraction fluid, which flows through it, are largely caught and retained, thus removing them from the extract.

¹ This test method is under the jurisdiction of ASTM Committee D34 on Waste Management and is the direct responsibility of Subcommittee D34.01.06 on Analytical Methods.

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² The MDL is determined following the Code of Federal Regulations, 40 CFR Part 136, Appendix B utilizing solvent extraction of soil by PFE. 10 gram sample of Ottawa Sand was utilized. A detailed process determining the MDL is explained in the reference and is beyond the scope of this test method to be explained here.

³ Reporting range concentration is calculated from Table 4 concentrations assuming a 25 µL injection of the Level 1 calibration standard for BPA, and the highest level calibration standard with a 5 mL final extract volume of a 10 gram soil sample. Volume variations will change the reporting limit and ranges.

⁴ 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.

⁵ Available from National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA, 22161 or at <http://www.epa.gov/epawaste/hazard/testmethods/index.htm>

⁶ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>.