



Standard Test Methods for Lead in Water¹

This standard is issued under the fixed designation D 3559; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 These test methods cover the determination of dissolved and total recoverable lead in water and waste water by atomic-absorption spectrophotometry² and differential pulse anodic stripping voltammetry. Four test methods are included as follows:

	Concentration Range	Sections
Test Method A—Atomic Absorption, Direct	1.0 to 10 mg/L	7 to 15
Test Method B—Atomic Absorption, Chelation-Extraction	100 to 1000 µg/L	16 to 24
Test Method C—Differential Pulse Anodic Stripping Voltammetry	1 to 100 µg/L	25 to 35
Test Method D—Atomic Absorption, Graphite Furnace	5 to 100 µg/L	36 to 44

1.2 Test Method B can be used to determine lead in brines. Test Method D has been used successfully with reagent water, lake water, well water, filtered tap water, condensate from a medium Btu coal gasification process, waste treatment plant effluent, and a production plant process water.

1.3 It is the user's responsibility to ensure the validity of these test methods for waters of untested matrices.

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.* For specific hazards statements, see 10.4.1, Note 2, 11.2, 11.3, 21.7, 21.8, 21.11, 23.7, 23.10, 32.2.1, and 33.1.

2. Referenced Documents

2.1 ASTM Standards:

D 858 Test Methods for Manganese in Water³

¹ These test methods are under the jurisdiction of ASTM Committee D19 on Water and are the direct responsibility of Subcommittee D19.05 on Inorganic Constituents in Water.

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² Platte, J. A., and Marcy, V. M., "A New Tool for the Water Chemist," *Industrial Water Engineering*, May 1965.

Brown, E., Skougstad, M. W., and Fishman, M. J., "Methods for Collection and Analysis of Water Samples for Dissolved Minerals and Gases," *Techniques of Water-Resources Investigations of the U. S. Geological Survey*, Book 5, Chapter 1, 1970, p. 115.

³ *Annual Book of ASTM Standards*, Vol 11.01.

D 1066 Practice for Sampling Steam³
D 1068 Test Methods for Iron in Water³
D 1129 Terminology Relating to Water³
D 1192 Specification for Equipment for Sampling Water and Steam in Closed Conduits³
D 1193 Specification for Reagent Water³
D 1687 Test Methods for Chromium in Water³
D 1688 Test Methods for Copper in Water³
D 1691 Test Methods for Zinc in Water³
D 1886 Test Methods for Nickel in Water³
D 2777 Practice for Determination of Precision and Bias of Applicable Methods of Committee D-19 on Water³
D 3370 Practices for Sampling Water from Closed Conduits³
D 3557 Test Methods for Cadmium in Water³
D 3558 Test Methods for Cobalt in Water³
D 3919 Practice for Measuring Trace Elements in Water by Graphite Furnace Atomic Absorption Spectrophotometry³
D 4841 Practice for Estimation of Holding Time for Water Samples Containing Organic and Inorganic Constituents³
D 5810 Guide for Spiking into Aqueous Samples³
D 5847 Practice for the Writing Quality Control Specifications for Standard Test Methods for Water Analysis³
E 60 Practice for Photometric and Spectrophotometric Methods for Chemical Analysis of Metals⁴
E 275 Practice for Describing and Measuring Performance of Ultraviolet, Visible, and Near Infrared Spectrophotometers⁵

3. Terminology

3.1 *Definitions*—For definition of terms used in these test methods, refer to Terminology D 1129.

3.2 *total recoverable lead*—an arbitrary analytical term relating to the recoverable forms of lead that are determined by the digestion method which are included in the procedure.

4. Significance and Use

4.1 The test for lead is necessary because it is a toxicant and because there is a limit specified for lead in potable water in the National Interim Primary Drinking Water Regulations. This

⁴ *Annual Book of ASTM Standards*, Vol 03.05.

⁵ *Annual Book of ASTM Standards*, Vol 03.06.

*A Summary of Changes section appears at the end of this standard.