



Standard Test Methods for Cadmium in Water¹

This standard is issued under the fixed designation D 3557; 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 cover the determination of dissolved and total recoverable cadmium in water and wastewater by atomic-absorption spectrophotometry and differential pulse anodic stripping voltammetry.² Four test methods are included as follows:

	Concentration Range	Sections
Test Method A—Atomic Absorption, Direct	0.05 to 2.0 mg/L	7 to 15
Test Method B—Atomic Absorption, Chelation-Extraction	5 to 200 µg/L	16 to 24
Test Method C—Differential Pulse Anodic Stripping Voltammetry	1 to 100 µg/L	25 to 34
Test Method D—Atomic Absorption, Graphite Furnace	2 to 10 µg/L	35 to 43

1.2 Test Method B can be used to determine cadmium in brines. It is the user's responsibility to ensure the validity of these test methods for waters of untested matrices.

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:

- D 858 Test Methods for Manganese in Water³
- 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

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.

Current edition approved March 10, 2002. Published June 2002. Originally published as D 3557 – 77. Last previous edition D 3557 – 95.

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

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

- 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 D19 on Water³
- D 3370 Practices for Sampling Water from Closed Conduits³
- D 3558 Test Methods for Cobalt in Water³
- D 3559 Test Methods for Lead 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 Writing Quality Control Specifications for Standard Test Methods for Water Analysis⁴

3. Terminology

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

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *spiking solution*—the standard solution added to the polarographic cell that is used to quantitate the sample.

3.2.2 *stripping peak potential*—the applied potential versus SCE at which the stripping peak current is a maximum.

3.2.3 *SCE*—saturated calomel electrode.

3.2.4 *stripping peak signal*—the current measured at the stripping peak maximum for a metal.

4. Significance and Use

4.1 The test for cadmium is necessary because it is a toxicant and because there is a limit specified for cadmium in potable water in the National Interim Primary Drinking Water Regulations. This test serves to determine whether the cadmium content of potable water is above or below the acceptable limit.

5. Purity of Reagents

5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall

⁴ *Annual Book of ASTM Standards*, Vol 11.02.