



Standard Test Methods for Zinc in Water ¹

This standard is issued under the fixed designation D 1691; 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. Consult the DoD Index of Specifications and Standards for the specific year of issue which has been adopted by the Department of Defense.

1. Scope

1.1 These test methods cover the determination of zinc in water. Two test methods are given as follows:

		Sections
Test Method A—Atomic Absorption, Direct	0.05 to 2 mg/L	8-16
Test Method B—Atomic Absorption, Chelation-Extraction	20 to 200 µg/L	17-25

1.2 Either dissolved or total recoverable zinc may be determined.

1.3 These test methods have been used successfully with reagent grade water. See the specific test method for applicability to other matrices. It is the user's responsibility to assure the validity of these test methods in other 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 hazard statements, see Section 6 and Note 5, Note 8, and Note 13.

1.5 Two former colorimetric test methods were discontinued. Refer to Appendix X1 for historical information.

2. Referenced Documents

2.1 ASTM Standards:

- D 858 Test Methods for Manganese in Water ²
- D 1066 Practice for Sampling Steam ²
- D 1068 Test Methods for Iron in Water ²
- D 1129 Terminology Relating to Water ²
- D 1192 Specification for Equipment for Sampling Water and Steam in Closed Conduits ²
- D 1193 Specification for Reagent Water ²
- D 1687 Test Methods for Chromium in Water ²
- D 1688 Test Methods for Copper in Water ²
- D 1886 Test Methods for Nickel in Water ²
- D 2777 Practice for Determination of Precision and Bias of Applicable Methods of Committee D-19 on Water ²

¹ These test methods are under the jurisdiction of ASTM Committee D-19 on Water and are the direct responsibility of Subcommittee D19.05 on Inorganic Constituents in Water.

Current edition approved Sept. 10, 1995. Published November 1995. Originally published as D 1691 – 59 T. Last previous edition D 1691 – 90.

² *Annual Book of ASTM Standards*, Vol 11.01.

D 3370 Practices for Sampling Water from Closed Conduits ²

D 3557 Test Methods for Cadmium in Water ²

D 3558 Test Methods for Cobalt in Water ²

D 3559 Test Methods for Lead in Water ²

D 4841 Practice for Estimation of Holding Time for Water Samples Containing Organic and Inorganic Constituents ²

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 *total recoverable zinc*—an arbitrary analytical term relating to the recoverable form of zinc that is determinable by the digestion method which is included in the Procedure.

4. Significance and Use

4.1 Zinc is an essential and beneficial element in body growth. Concentrations above 5 mg/L can cause a bitter astringent taste and opalescence in alkaline waters. The zinc concentration of U.S. drinking waters varies between 0.06 and 7.0 mg/L with a mean of 1.33 mg/L. Zinc most commonly enters the domestic water supply from deterioration of galvanized iron and dezincification of brass. Zinc in water also may result from industrial water pollution. ³

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 conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. ⁴ Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

5.2 *Purity of Water*—Unless otherwise indicated, references

³ "Standard Methods for the Examination of Water and Wastewater," 16th edition, 1985, APHA, AWWA-WPCF.

⁴ *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see *Analar Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopeia and National Formulary*, U.S. Pharmaceutical Convention, Inc. (USPC), Rockville, MD.