



Standard Test Methods for Nitrite-Nitrate in Water¹

This standard is issued under the fixed designation D3867; 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 nitrite nitrogen, nitrate nitrogen, and combined nitrite-nitrate nitrogen in water and wastewater in the range from 0.05 to 1.0 mg/L nitrogen. Two test methods² are given as follows:

Test Method A—Automated Cadmium Reduction	Sections 9 to 18
Test Method B—Manual Cadmium Reduction	19 to 28

1.2 These test methods are applicable to surface, saline, waste, and ground waters. It is the user's responsibility to ensure the validity of these test methods for waters of untested matrices.

1.3 The values stated in either SI or inch-pound units are to be regarded as the standard. No other units of measurement are included in this standard.

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 [Notes 1 and 2](#).

2. Referenced Documents

2.1 ASTM Standards:³

[D1129 Terminology Relating to Water](#)

[D1141 Practice for the Preparation of Substitute Ocean Water](#)

[D1193 Specification for Reagent Water](#)

[D2777 Practice for Determination of Precision and Bias of Applicable Test Methods of Committee D19 on Water](#)

[D3370 Practices for Sampling Water from Closed Conduits](#)

[D5810 Guide for Spiking into Aqueous Samples](#)

¹ These test methods are under the jurisdiction of ASTM Committee [D19](#) on Water and are the responsibility of Subcommittee [D19.05](#) on Inorganic Constituents in Water.

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² Methods similar to these appear in *Methods of Chemical Analysis of Water and Wastes*, 2nd edition, U.S. Environmental Protection Agency.

³ 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.

[D5847 Practice for Writing Quality Control Specifications for Standard Test Methods for Water Analysis](#)

[D7781 Test Method for Nitrite-Nitrate in Water by Nitrate Reductase](#)

[E60 Practice for Analysis of Metals, Ores, and Related Materials by Spectrophotometry](#)

[E275 Practice for Describing and Measuring Performance of Ultraviolet and Visible Spectrophotometers](#)

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in these test standards, refer to Terminology [D1129](#).

4. Summary of Test Methods

4.1 *Total Oxidized Nitrogen*—a filtered sample is passed through a column containing copper-coated cadmium granules to reduce nitrate ion to nitrite ion. The combined nitrite-nitrate nitrogen is determined by diazotizing the total nitrite ion with sulfanilamide and coupling with *N*-(1-naphthyl)ethylenediamine dihydrochloride to form a highly colored azo dye that is measured spectrophotometrically.

4.2 *Nitrite*—the nitrite ion originally present in the sample can be determined separately by carrying out the procedure and omitting the cadmium reduction step.

4.3 *Nitrate*—the nitrate ion can be calculated as the difference between the combined nitrite-nitrate nitrogen and the nitrite nitrogen.

5. Significance and Use

5.1 Both test methods use identical reagents and sample processing. The only difference between the two methods is that one test method is automated and the other is manual. The ranges and interferences are identical.

5.2 The automated test method is preferred when large numbers of samples are to be analyzed. The manual test method is used for fewer samples or when automated instrumentation is not available.

5.3 These test methods replace Test Methods [D1254](#) (Nitrite) and [D992](#) (Nitrate). The nitrite test method (Test Method [D1254](#)) used a reagent that is considered to be a potential carcinogen. The nitrate test method (Test Method [D992](#)) has

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