



Designation: D8001 – 16 (Reapproved 2024)

Standard Test Method for Determination of Total Nitrogen, Total Kjeldahl Nitrogen by Calculation, and Total Phosphorus in Water, Wastewater by Ion Chromatography¹

This standard is issued under the fixed designation D8001; 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 This test method is applicable for the analysis total nitrogen (organic nitrogen + ammonia-N + nitrate-N + nitrite-N) as nitrate and total phosphorus as orthophosphate in unfiltered water samples by alkaline persulfate digestion followed by ion chromatography (IC).

1.2 Total Kjeldahl nitrogen (TKN) is determined by the calculation. To determine TKN subtract the nitrate-N and nitrite-N in a digested sample from a non-digested sample (see Section 4, Summary of Test Method).

1.3 The limit of detection (LOD), limit of quantitation (LOQ), and reporting range in Table 1 are based on the two-step process for this test method: digestion and analytical step. Because the digestion step requires a sample dilution, the LOD and LOQ are higher than undigested samples. The reporting range, LOD, and LOQ can be modified and perhaps improved depending on several factors (see Section 6, Interferences).

1.4 The method detection limits (MDL) are shown for reference. The digestion reagent contains background nitrate and results in higher detection limits. MDL will be shown after the interlaboratory study (ILS) is completed.

1.5 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.6 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the*

Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 *ASTM Standards:*²

D1129 Terminology Relating to Water
D1193 Specification for Reagent Water
D2777 Practice for Determination of Precision and Bias of Applicable Test Methods of Committee D19 on Water
D3856 Guide for Management Systems in Laboratories Engaged in Analysis of Water (Withdrawn 2024)³
D4327 Test Method for Anions in Water by Suppressed Ion Chromatography
D5810 Guide for Spiking into Aqueous Samples
D5847 Practice for Writing Quality Control Specifications for Standard Test Methods for Water Analysis
D6299 Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical Measurement System Performance
D6792 Practice for Quality Management Systems in Petroleum Products, Liquid Fuels, and Lubricants Testing Laboratories

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this standard, refer to Terminology D1129.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *total Kjeldahl nitrogen (TKN), n*—the sum of organic nitrogen plus ammonia (NH_3).

3.2.2 *total nitrogen (TN), n*—the sum of all nitrate, nitrite, ammonia, and organic nitrogen, as N, in water or wastewater samples.

¹ This test method is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.06 on Methods for Analysis for Organic Substances in Water.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.