



Designation: D4195 – 08

# Standard Guide for Water Analysis for Reverse Osmosis and Nanofiltration Application<sup>1</sup>

This standard is issued under the fixed designation D4195; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This guide covers the analyses that should be performed on any given water sample if reverse osmosis (RO) or nanofiltration (NF) application is being considered.

1.2 This guide is applicable to waters including brackish waters and seawaters but is not necessarily applicable to waste waters.

1.3 This is a guide only and should not be construed as a delineation of all ions known to exist in waters.

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

1.5 *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:<sup>2</sup>

- D511 Test Methods for Calcium and Magnesium In Water
- D512 Test Methods for Chloride Ion In Water
- D513 Test Methods for Total and Dissolved Carbon Dioxide in Water
- D516 Test Method for Sulfate Ion in Water
- D857 Test Method for Aluminum in Water
- D858 Test Methods for Manganese in Water
- D859 Test Method for Silica in Water
- D888 Test Methods for Dissolved Oxygen in Water
- D1068 Test Methods for Iron in Water
- D1129 Terminology Relating to Water

<sup>1</sup> This guide is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.08 on Membranes and Ion Exchange Materials.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

- D1179 Test Methods for Fluoride Ion in Water
  - D1253 Test Method for Residual Chlorine in Water
  - D1293 Test Methods for pH of Water
  - D1889 Test Method for Turbidity of Water (Withdrawn 2007)<sup>3</sup>
  - D2579 Test Method for Total Organic Carbon in Water (Withdrawn 2002)<sup>3</sup>
  - D3352 Test Method for Strontium Ion in Brackish Water, Seawater, and Brines
  - D3370 Practices for Sampling Water from Closed Conduits
  - D3561 Test Method for Lithium, Potassium, and Sodium Ions in Brackish Water, Seawater, and Brines by Atomic Absorption Spectrophotometry
  - D3867 Test Methods for Nitrite-Nitrate in Water
  - D4189 Test Method for Silt Density Index (SDI) of Water
  - D4194 Test Methods for Operating Characteristics of Reverse Osmosis and Nanofiltration Devices
  - D4382 Test Method for Barium in Water, Atomic Absorption Spectrophotometry, Graphite Furnace
  - D6161 Terminology Used for Microfiltration, Ultrafiltration, Nanofiltration and Reverse Osmosis Membrane Processes
- ### 2.2 American Public Health Association:
- Standard Methods for the Examination of Water and Wastewater, Sixteenth Edition, 1985, pp. 470–478, Part 427, Sulfite<sup>4</sup>

## 3. Terminology

3.1 *Definitions*—For definitions of terms used in this guide, refer to Terminology D1129 and D6161.

## 4. Summary of Guide

4.1 This guide consists of analyzing water samples for ions, gases, suspended material, and organics, as well as measuring the pH and temperature of the water.

## 5. Significance and Use

5.1 The performance of RO or NF membranes is strongly influenced by the composition of the feed solution. Overall salt

<sup>3</sup> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).

<sup>4</sup> American Public Health Association, 800 I Street, NW Washington, DC 20001, <http://www.apha.org/>.