



Designation: D2186 – 05(Reapproved 2009)

Standard Test Methods for Deposit-Forming Impurities in Steam¹

This standard is issued under the fixed designation D2186; 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 the amount of deposit-forming impurities in steam. Determinations are made on condensed steam samples in all test methods. Test Methods A, B, and C give a measure of the amount of total deposit-forming material present; Test Method D deals with special constituents that may be present. Special precautions and equipment, calculation procedures, and ranges of applicability are described. The following test methods are included:

	Sections
Test Method A (Gravimetric or Evaporative)	6 to 12
Test Method B (Electrical Conductivity)	13 to 19
Test Method C (Sodium Tracer)	20 to 26
Test Method D (Silica and Metals)	27 to 30

1.2 Test Method A is applicable for determining total dissolved and suspended solids in concentrations normally not less than 0.4 mg/L (ppm). It is applicable only to long-time steady-state conditions and is not applicable for transients.

1.3 Test Method B will measure minimum impurity concentrations varying from 3 mg/L (ppm) down to at least 0.005 mg/L (ppm), depending on the means for removing dissolved gases from the steam condensate. The means for removing dissolved gases also affects the storage capacity of steam condensate in the system and, thus, affects the response of the system to transients.

1.4 Because of the high sensitivity of methods for measuring sodium in steam condensate, Test Method C provides the most sensitive measure of impurity content for samples in which sodium is an appreciable percentage of the impurities present. Concentrations as low as 4.0 $\mu\text{g/L}$ (ppb) can be detected by inductively coupled plasma atomic emission spectroscopy, 0.2 $\mu\text{g/L}$ (ppb) by atomic absorption spectrophotometry, 0.1 $\mu\text{g/L}$ (ppb) by graphite furnace atomic absorption spectroscopy, and as low as 0.5 $\mu\text{g/L}$ (ppb) by sodium ion electrode. The apparatus can be designed with low volume, and, therefore, Test Method C is the most responsive to transient conditions.

¹ These test methods are under the jurisdiction of ASTM Committee D19 on Water and are the direct responsibility of Subcommittee D19.03 on Sampling Water and Water-Formed Deposits, Analysis of Water for Power Generation and Process Use, On-Line Water Analysis, and Surveillance of Water.

Current edition approved May 1, 2009. Published June 2009. Originally approved in 1966. Last previous edition approved in 2005 as D2186 – 05. DOI: 10.1520/D2186-05R09.

1.5 Test Method D covers the determination of silica and metals in steam, which are not included in Test Methods B and C and are not individually determined using Test Method A.

1.6 *This standard does not purport to address 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:²

- D512 Test Methods for Chloride Ion in Water
- D516 Test Method for Sulfate Ion in Water
- D857 Test Method for Aluminum in Water
- D859 Test Method for Silica in Water
- D1066 Practice for Sampling Steam
- D1068 Test Methods for Iron in Water
- D1125 Test Methods for Electrical Conductivity and Resistivity of Water
- D1129 Terminology Relating to Water
- D1687 Test Methods for Chromium in Water
- D1688 Test Methods for Copper in Water
- D1886 Test Methods for Nickel in Water
- D1976 Test Method for Elements in Water by Inductively-Coupled Argon Plasma Atomic Emission Spectroscopy
- D2791 Test Method for On-line Determination of Sodium in Water
- D3082 Test Method for Boron in Water
- D3370 Practices for Sampling Water from Closed Conduits
- D3867 Test Methods for Nitrite-Nitrate in Water
- D4191 Test Method for Sodium in Water by Atomic Absorption Spectrophotometry
- D5542 Test Methods for Trace Anions in High Purity Water by Ion Chromatography
- D5907 Test Methods for Filterable Matter (Total Dissolved Solids) and Nonfilterable Matter (Total Suspended Solids) in Water
- D6071 Test Method for Low Level Sodium in High Purity

² 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.