



Designation: D5173 – 15 (Reapproved 2023)

Standard Guide for On-Line Monitoring of Total Organic Carbon in Water by Oxidation and Detection of Resulting Carbon Dioxide¹

This standard is issued under the fixed designation D5173; 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 guide covers the selection, establishment, and application of monitoring systems for carbon and carbon compounds by on-line, automatic analysis, and recording or otherwise signaling of output data. The system chosen will depend on the purpose for which it is intended (for example, regulatory compliance, process monitoring, or to alert the user to adverse trends) and on the type of water to be monitored (low purity or high purity, with or without suspended particulates, purgeable organics, or inorganic carbon). If it is to be used for regulatory compliance, the test method published or referenced in the regulations should be used in conjunction with this guide and other ASTM test methods. This guide covers carbon concentrations of 0.05 $\mu\text{g/L}$ to 50 000 mg/L . Low end sensitivity and quantitative results may vary among instruments. This guide covers the on-line measurement techniques listed in Table 1. Additional laboratory test methods are available: Test Methods D4129, D4839, D5904, D6317, and D7573.

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

1.3 *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.* For specific hazard statements, see Section 9.

1.4 *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
- D3370 Practices for Sampling Water from Flowing Process Streams
- D3694 Practices for Preparation of Sample Containers and for Preservation of Organic Constituents
- D3864 Guide for On-Line Monitoring Systems for Water Analysis
- D4129 Test Method for Total and Organic Carbon in Water by High Temperature Oxidation and by Coulometric Detection
- D4453 Practice for Handling of High Purity Water Samples
- D4839 Test Method for Total Carbon and Organic Carbon in Water by Ultraviolet, or Persulfate Oxidation, or Both, and Infrared Detection
- D5904 Test Method for Total Carbon, Inorganic Carbon, and Organic Carbon in Water by Ultraviolet, Persulfate Oxidation, and Membrane Conductivity Detection
- D5997 Test Method for On-Line Monitoring of Total Carbon, Inorganic Carbon in Water by Ultraviolet, Persulfate Oxidation, and Membrane Conductivity Detection
- D6317 Test Method for Low Level Determination of Total Carbon, Inorganic Carbon and Organic Carbon in Water by Ultraviolet, Persulfate Oxidation, and Membrane Conductivity Detection
- D7573 Test Method for Total Carbon and Organic Carbon in Water by High Temperature Catalytic Combustion and Infrared Detection

2.2 Other Standards:

- EN1484 European Standard Water Analysis Guidelines for the Determination of Total Organic Carbon (TOC) and Dissolved Organic Carbon (DOC)³

¹ This guide is under the jurisdiction of ASTM Committee D19 on Water and is 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.

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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.

³ Available from European Committee for Standardization (CEN), Avenue Marnix 17, B-1000, Brussels, Belgium, <http://www.cen.eu>.