



Designation: D7573 – 18

Standard Test Method for Total Carbon and Organic Carbon in Water by High Temperature Catalytic Combustion and Infrared Detection¹

This standard is issued under the fixed designation D7573; 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 covers the determination of total carbon (TC), inorganic carbon (IC), total organic carbon (TOC), dissolved organic carbon (DOC), and non-purgable organic carbon (NPOC) in drinking water, groundwater, surface water, wastewater, and seawater in the range from 0.5 mg/L to 50 mg/L. Concentrations of 50–4000 mg/L of carbon may be determined by automated injection of less sample volume or by sample dilution. Alternatively, use less sample volume and calibrate at higher concentrations..

1.2 The sample is injected into a tube heated at $\geq 680^{\circ}\text{C}$. The sample converts into a gaseous phase and forced through a layer of catalyst ensuring conversion of all carbon containing compounds to CO_2 . A non-dispersive infrared (NDIR) detector measures the resulting CO_2 .

1.3 For TOC and DOC analysis a portion of the sample is injected to determine TC or dissolved carbon (DC). A portion of the sample is then acidified and purged to remove the IC. The purged inorganic carbon is measured as TIC, or DIC. TOC or DOC is calculated by subtracting the inorganic fraction from the total carbon:

$$\text{TOC} = \text{TC} - \text{IC} \quad (1)$$

1.4 For NPOC analysis a portion of sample is acidified and purged to remove IC. The purged sample is then injected to determine NPOC.

1.5 This test method is applicable to the matrices and concentrations validated in the inter-laboratory study. It is the user's responsibility to ensure the validity of this test method for waters of untested matrices and different concentration ranges.

1.6 This test method is applicable only to carbonaceous matter in the sample that can be introduced into the reaction

zone. The syringe needle or injector opening size generally limits the maximum size of particles that can be so introduced.

1.7 In addition to laboratory analyses, this test method may be applied to stream monitoring.

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

1.9 *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.*

1.10 *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
- D1192 Guide for Equipment for Sampling Water and Steam in Closed Conduits (Withdrawn 2003)³
- 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
- D4448 Guide for Sampling Ground-Water Monitoring Wells
- D5847 Practice for Writing Quality Control Specifications for Standard Test Methods for Water Analysis
- D6538 Guide for Sampling Wastewater With Automatic Samplers
- D6759 Practice for Sampling Liquids Using Grab and Discrete Depth Samplers

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 service@astm.org. 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.