



Designation: D7678 – 17 (Reapproved 2022)

Standard Test Method for Total Oil and Grease (TOG) and Total Petroleum Hydrocarbons (TPH) in Water and Wastewater with Solvent Extraction using Mid-IR Laser Spectroscopy¹

This standard is issued under the fixed designation D7678; 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 oil and grease (TOG) and total petroleum hydrocarbons (TPH) in water and waste water that are extractable by this test method from an acidified sample with a cyclic aliphatic hydrocarbon (for example cyclohexane, cyclopentane) and measured by IR absorption in the region from 1370 cm^{-1} to 1380 cm^{-1} ($7.25\text{ }\mu\text{m}$ to $7.30\text{ }\mu\text{m}$) using a mid-IR laser spectrometer. Polar substances are removed by clean-up with Florisil.²

1.2 This test method also considers the volatile fraction of petroleum hydrocarbons, which is lost by gravimetric methods that require solvent evaporation prior to weighing, as well as by solvent-less IR methods that require drying of the employed solid phase material prior to measurement. Similarly, a more complete fraction of extracted petroleum hydrocarbons are accessible by this test method as compared to GC methods that use a time window for quantification, as petroleum hydrocarbons eluting outside these windows are quantified too.

1.3 This test method covers the range of 0.1 mg/L to 1000 mg/L and may be extended to a lower or higher level by extraction of a larger or smaller sample volume collected separately.

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

1.6 *This international standard was developed in accordance with internationally recognized principles on standard-*

ization 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:³

- 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
- D3921 Test Method For Oil and Grease and Petroleum Hydrocarbons in Water (Withdrawn 2013)⁴
- D5847 Practice for Writing Quality Control Specifications for Standard Test Methods for Water Analysis
- E168 Practices for General Techniques of Infrared Quantitative Analysis

2.2 ISO Standards:⁵

- ISO 9377-2 Determination of Hydrocarbon Oil Index

2.3 Code of Federal Regulations (CFR) Publications:⁶

- 40 CFR Part 136 Guidelines Establishing Test Procedures for the Analysis of Pollutants
- 49 CFR Part 172 Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans

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 Florisil is a trademark by U.S. Silica Company, Frederick, MD.

³ 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.

⁴ The last approved version of this historical standard is referenced on www.astm.org.

⁵ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.

⁶ Available from U.S. Government Printing Office, Superintendent of Documents, 732 N. Capitol St., NW, Washington, DC 20401-0001, <http://www.access.gpo.gov>.