



Designation: D4128 – 18

Standard Guide for Identification and Quantitation of Organic Compounds in Water by Combined Gas Chromatography and Electron Impact Mass Spectrometry¹

This standard is issued under the fixed designation D4128; 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 identification and quantitation of organic compounds by gas chromatography/mass spectrometry (GC-MS) (electron impact) that are present or extracted from water and are capable of passing through a gas chromatograph without alteration. This guide can be used to provide tentative identifications of volatile and semi-volatile organics, but is restricted to (a) compounds for which reference spectra can be obtained and (b) compounds that can be separated by gas chromatography (GC). These restrictions are imposed on the guide, but are not a limitation of the technique. The guide is written for analysis using automated data acquisition and handling.

1.2 Guidelines have been included for quantitation using ASTM Test Methods [D3871](#), [D3973](#), and other GC-MS volatile/semivolatile procedures used for environmental analysis². The actual detection limits for each component must be determined in each laboratory. Actual detection amounts will vary with the complexity of the matrix, the kind and condition of the GC-MS system, the sample preparation technique chosen, and the application of cleanup techniques to the sample extract, if any. Lower levels of detection can be achieved using modern sensitive instruments or with selected ion monitoring (SIM). To determine the interlaboratory detection estimate (IDE) and the interlaboratory quantitation estimate (IQE), follow Practices [D6091](#) and [D6512](#).

1.3 The guide is applicable to the identification of many organic constituents of natural and treated waters. It includes all modes of sample introduction, including injection of organic extracts, direct aqueous injection, and purge and trap techniques.

1.4 The guide is applicable to capillary column gas chromatography.

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

1.6 *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.*

1.7 *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:³

- [D1066 Practice for Sampling Steam](#)
- [D1129 Terminology Relating to Water](#)
- [D1192 Guide for Equipment for Sampling Water and Steam in Closed Conduits](#) (Withdrawn 2003)⁴
- [D1193 Specification for Reagent Water](#)
- [D2908 Practice for Measuring Volatile Organic Matter in Water by Aqueous-Injection Gas Chromatography](#)
- [D3370 Practices for Sampling Water from Flowing Process Streams](#)
- [D3694 Practices for Preparation of Sample Containers and for Preservation of Organic Constituents](#)
- [D3871 Test Method for Purgeable Organic Compounds in Water Using Headspace Sampling](#)
- [D3973 Test Method for Low-Molecular Weight Halogenated Hydrocarbons in Water](#)
- [D5175 Test Method for Organohalide Pesticides and Polychlorinated Biphenyls in Water by Microextraction and](#)

¹ This guide 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 EPA Methods 624 and 8260C (volatiles) and EPA Methods 625 and 8270D (semivolatiles) are suitable for quantitation.

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.