



Designation: D4177 – 95 (Reapproved 2010)



Designation: Manual of Petroleum Measurement Standards (MPMS), Chapter 8.2

Standard Practice for Automatic Sampling of Petroleum and Petroleum Products¹

This standard is issued under the fixed designation D4177; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This practice covers information for the design, installation, testing, and operation of automated equipment for the extraction of representative samples of petroleum and petroleum products from a flowing stream and storing them in a sample receiver. If sampling is for the precise determination of volatility, use Practice [D5842](#) (API [MPMS Chapter 8.4](#)) in conjunction with this practice. For sample mixing, refer to Practice [D5854](#) (API [MPMS Chapter 8.3](#)). Petroleum products covered in this practice are considered to be a single phase and exhibit Newtonian characteristics at the point of sampling.

1.2 *Applicable Fluids*—This practice is applicable to petroleum and petroleum products with vapor pressures at sampling and storage temperatures less than or equal to 101 kPa (14.7 psi). Refer to [D5842](#) (API [MPMS Chapter 8.4](#)) when sampling for Reid vapor pressure (RVP) determination.

1.3 *Non-applicable Fluids*—Petroleum products whose vapor pressure at sampling and sample storage conditions are above 101 kPa (14.7 psi) and liquified gases (that is, LNG, LPG etc.) are not covered by this practice.

1.3.1 While the procedures covered by this practice will produce a representative sample of the flowing liquid into the sample receiver, specialized sample handling may be necessary to maintain sample integrity of more volatile materials at high temperatures or extended residence time in the receiver. Such handling requirements are not within the scope of this practice. Procedures for sampling these fluids are described in Practice [D1265](#), Test Method [D1145](#), and [GPA 2166](#).

1.4 [Annex A2](#) contains theoretical calculations for selecting the sampler probe location. [Annex A3](#) lists acceptance methodologies for sampling systems and components. [Annex A4](#) gives performance criteria for permanent installations, while [Annex A5](#) has the criteria for portable sampling units. [Annex](#)

[A6](#) provides sampler acceptance test data. [Appendix X1](#) is a design data sheet for automatic sampling systems. [Appendix X2](#) compares the percent sediment and water to unloading time period.

1.5 The values stated in SI units are to be regarded as standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:²

[D923](#) Practices for Sampling Electrical Insulating Liquids

[D1145](#) Test Method for Sampling Natural Gas³

[D1265](#) Practice for Sampling Liquefied Petroleum (LP) Gases, Manual Method

[D4057](#) Practice for Manual Sampling of Petroleum and Petroleum Products

[D4928](#) Test Methods for Water in Crude Oils by Coulometric Karl Fischer Titration

[D5842](#) Practice for Sampling and Handling of Fuels for Volatility Measurement

[D5854](#) Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products

2.2 API Standards:⁴

API Manual of Petroleum Measurement Standards, Chapters 3, 4, 5, 6, and 10

[MPMS Chapter 8.1](#) Practice for Manual Sampling of Petroleum and Petroleum Products (ASTM Practice [D4057](#))

[MPMS Chapter 8.3](#) Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products (ASTM Practice [D5854](#))

[MPMS Chapter 8.4](#) Practice for Manual Sampling and Handling of Fuels for Volatility Measurement (ASTM Practice [D5842](#))

¹ This practice is under the jurisdiction of ASTM Committee [D02](#) on Petroleum Products and Lubricants and the API Committee on Petroleum Measurement, and is the direct responsibility of Subcommittee [D02.02.0B](#) the joint ASTM-API Committee on Sampling, Sediment, 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 Withdrawn.

⁴ Available from American Petroleum Institute (API), 1220 L. St., NW, Washington, DC 20005-4070, <http://www.api.org>.