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.

Designation: D4177 – 20

Manual of Petroleum Measurement Standards (MPMS), Chapter 8.2

Standard Practice for Automatic Sampling of Petroleum and Petroleum Products[1]

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 U.S. Department of Defense.

INTRODUCTION

The previous version of the automatic sampling practice described the design, installation, testing, and operation of automated equipment for the extraction of representative samples from the flowing stream and storing mainly for crude oil.

This practice is a performance-based standard. It still includes the design, installation, testing, and operation of automated equipment for extraction of representative samples. It also includes the testing and proving of a sampling system in the field under actual operating conditions to ensure that the equipment, installation, and operating procedures produce representative samples. The acceptance criteria for custody transfer are covered in this practice. This practice does not address how to sample crude at temperatures below the freezing point of water. Extensive revisions have been made to the prior version of D4177 (API *MPMS* Chapter 8.2).

This practice also provides guidance for periodic verification of the sampling system.

This practice is separated into three parts:

General—Sections 5 – 17 (Part I) are currently applicable to crude oil and refined products. Review this section before designing or installing any automatic sampling system.

Crude Oil Sampling—Section 18 (Part II) contains additional information required to complete the design, testing, and monitoring of a crude oil sampling system.

Refined Product Sampling—Section 19 (Part III) contains additional information required to complete the design of a refined product sampling system.

A representative sample is "A portion extracted from the total volume that contains the constituents in the same proportions that are present in that total volume." Representative samples are required for the determination of chemical and physical properties that are used to establish standard volumes, prices, and compliance with commercial and regulatory specifications.

The process of obtaining a representative sample consists of the following: the physical equipment, the correct matching of that equipment to the application, the adherence to procedures by the operator(s) of that equipment, and the proper handling and analysis.

1. Scope*

1.1 This practice describes general procedures and equipment for automatically obtaining samples of liquid petroleum and petroleum products, crude oils, and intermediate products from the sample point into the primary container. This practice also provides additional specific information about sample container selection, preparation, and sample handling. 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 and handling, refer to Practice D5854 (API *MPMS* Chapter 8.3). This practice does not cover sampling of electrical insulating oils and hydraulic fluids.

[1] This practice is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and the API Committee on Petroleum Measurement, and is the direct responsibility of Subcommittee D02.02 /COMQ the joint ASTM-API Committee on Hydrocarbon Measurement for Custody Transfer (Joint ASTM-API). This practice has been approved by the sponsoring committees and accepted by the Cooperating Societies in accordance with established procedures. This practice was issued as a joint ASTM-API standard in 1982.

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*A Summary of Changes section appears at the end of this standard

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