



Designation: D4418 – 17

Standard Practice for Receipt, Storage, and Handling of Fuels for Gas Turbines¹

This standard is issued under the fixed designation D4418; 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 practice covers the receipt, storage, and handling of fuels for gas turbines, except for gas turbines used in aircraft. It is intended to provide guidance for the control of substances in a fuel that could cause deterioration of either the fuel system, or the gas turbine, or both.

1.2 This practice provides no guidance for either the selection of a grade of fuel, a topic covered by Specification D2880, or for the safety aspects of the fuel and fuel systems. For example, this practice does not address the spacings of storage tanks, loading and unloading facilities, etc., and procedures for dealing with the flammability and toxic properties of the fuels.

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

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

1.5 *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

D1500 Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)

D1796 Test Method for Water and Sediment in Fuel Oils by the Centrifuge Method (Laboratory Procedure)

¹ This practice is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.E0 on Burner, Diesel, Non-Aviation Gas Turbine, and Marine Fuels.

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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.

D2274 Test Method for Oxidation Stability of Distillate Fuel Oil (Accelerated Method)

D2276 Test Method for Particulate Contaminant in Aviation Fuel by Line Sampling

D2880 Specification for Gas Turbine Fuel Oils

D4057 Practice for Manual Sampling of Petroleum and Petroleum Products

D6469 Guide for Microbial Contamination in Fuels and Fuel Systems

3. Terminology

3.1 Definitions:

3.1.1 *fuel entering the combustor(s)*—this term is used to designate the fuel that is actually burned in the gas turbine. Fuel may actually be sampled at a point upstream from the point of entry into the combustor(s), provided the sample is representative of the fuel actually entering the combustor(s).

3.1.2 *fuel contaminant, n*—material not intended to be present in a fuel, whether introduced during manufacture, handling, distribution, or storage, that makes the fuel less suitable for the intended use.

3.1.2.1 *Discussion*—Contaminants, which can be soluble in the fuel or insoluble (suspended liquid droplets or solid or semi-solid particles), can be the result of improper processing or contamination by a wide range of materials including water, rust, airblown dust, deterioration of internal protective coatings on pipes or vessels, and products of fuel degradation and microbial growth.

3.1.2.2 *Discussion*—Solid or semisolid contaminants can be referred to as silt or sediment.

3.1.3 *dissolved and free water, n*—water may be present in the fuel as dissolved water or as “free” (undissolved) water, or both. The free water may be fresh or saline. Fresh water may enter the fuel from steam coils in storage tanks, from condensation out of moisture-laden air, or from leaking cooling coils. Saline water can enter the fuel during transportation in barges or tankers.

3.1.4 *particulate solids, n*—may enter a fuel from the air (suspended dirt and aerosols) or from the distribution and storage systems (rust, corrosion products, gasket debris, and so forth).

3.1.5 *metallic compounds, n*—metals may be present as metallic compounds in the fuel as a natural result of the

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