



Standard Guide for Microbial Contamination in Fuels and Fuel Systems¹

This standard is issued under the fixed designation D6469; 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 provides personnel who have a limited microbiological background with an understanding of the symptoms, occurrence, and consequences of chronic microbial contamination. The guide also suggests means for detection and control of microbial contamination in fuels and fuel systems. This guide applies primarily to gasoline, aviation, boiler, industrial gas turbine, diesel, marine, furnace fuels and blend stocks (see Specifications [D396](#), [D910](#), [D975](#), [D1655](#), [D2069](#), [D2880](#), [D3699](#), [D4814](#), [D6227](#), and [D6751](#)), and fuel systems. However, the principles discussed herein also apply generally to crude oil and all liquid petroleum fuels. ASTM Manual 47² provides a more detailed treatment of the concepts introduced in this guide; it also provides a compilation of all of the standards referenced herein that are not found in the *Annual Book of ASTM Standards*, Section Five on Petroleum Products and Lubricants.

1.2 This guide is not a compilation of all of the concepts and terminology used by microbiologists, but it does provide a general understanding of microbial fuel contamination.

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

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.*

2. Referenced Documents

2.1 ASTM Standards:³

¹ This guide is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.14 on Stability and Cleanliness of Liquid Fuels.

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² MNL 47, *Fuel and Fuel System Microbiology: Fundamentals, Diagnosis, and Contamination Control*, Passman, F. J., ed., ASTM International, 2003.

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.

- [D130 Test Method for Corrosiveness to Copper from Petroleum Products by Copper Strip Test](#)
- [D396 Specification for Fuel Oils](#)
- [D445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids \(and Calculation of Dynamic Viscosity\)](#)
- [D515 Test Method for Phosphorus In Water \(Withdrawn 1997\)⁴](#)
- [D664 Test Method for Acid Number of Petroleum Products by Potentiometric Titration](#)
- [D888 Test Methods for Dissolved Oxygen in Water](#)
- [D910 Specification for Leaded Aviation Gasolines](#)
- [D974 Test Method for Acid and Base Number by Color-Indicator Titration](#)
- [D975 Specification for Diesel Fuel Oils](#)
- [D1067 Test Methods for Acidity or Alkalinity of Water](#)
- [D1126 Test Method for Hardness in Water](#)
- [D1293 Test Methods for pH of Water](#)
- [D1298 Test Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method](#)
- [D1331 Test Methods for Surface and Interfacial Tension of Solutions of Paints, Solvents, Solutions of Surface-Active Agents, and Related Materials](#)
- [D1426 Test Methods for Ammonia Nitrogen In Water](#)
- [D1655 Specification for Aviation Turbine Fuels](#)
- [D1744 Test Method for Determination of Water in Liquid Petroleum Products by Karl Fischer Reagent](#)
- [D1976 Test Method for Elements in Water by Inductively-Coupled Argon Plasma Atomic Emission Spectroscopy](#)
- [D2068 Test Method for Determining Filter Blocking Tendency](#)
- [D2069 Specification for Marine Fuels \(Withdrawn 2003\)⁴](#)
- [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](#)
- [D3240 Test Method for Undissolved Water In Aviation Turbine Fuels](#)
- [D3241 Test Method for Thermal Oxidation Stability of](#)

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

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