



Standard Guide for Microbial Contamination in Fuels and Fuel Systems¹

This standard is issued under the fixed designation D 6469; 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, and furnace fuels (see Specifications D 396, D 910, D 975, D 1655, D 2069, D 2880, D 3699, D 4814, and D 6227) and fuel systems. However, the principals discussed herein also apply generally to crude oil and all liquid petroleum fuels.

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 in SI units are to be regarded as the 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:

- D 130 Test Method for Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test²
- D 396 Specification for Fuel Oils²
- D 445 Test Method for Kinematic Viscosity of Transparent or Opaque Liquids (the Calculation of Dynamic Viscosity)²
- D 515 Test Methods for Phosphorus in Water³
- D 664 Test Method for Acid Number of Petroleum Products by Potentiometric Titration²
- D 888 Test Methods for Dissolved Oxygen in Water³
- D 910 Specification for Aviation Gasolines²
- D 974 Test Method for Acid and Base Number by Color-Indicator Titration²
- D 975 Specification for Diesel Fuel Oils²

- D 1067 Test Methods for Acidity or Alkalinity of Water³
- D 1126 Test Method for Hardness in Water³
- D 1293 Test Methods of pH of Water³
- D 1298 Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method²
- D 1331 Test Methods for Surface and Interfacial Tension of Solutions of Surface-Active Agents⁴
- D 1426 Test Methods for Ammonia Nitrogen in Water³
- D 1655 Specification for Aviation Turbine Fuels²
- D 1744 Test Method for Water in Liquid Petroleum Products by Karl Fischer Reagent²
- D 1976 Test Method for Elements in Water by Inductively-Coupled Argon Plasma Atomic Emission Spectroscopy³
- D 2068 Test Method for Filter Blocking Tendency of Distillate Fuel Oils²
- D 2069 Specification for Marine Fuels²
- D 2274 Test Method for Oxidation Stability of Distillate Fuel Oil (Accelerated Method)²
- D 2276 Test Method for Particulate Contaminant in Aviation Fuel by Line Sampling²
- D 2880 Specification for Gas Turbine Fuel Oils²
- D 3240 Test Method for Undissolved Water in Aviation Turbine Fuels⁵
- D 3241 Test Method for Thermal Oxidation Stability of Aviation Turbine Fuels (JFTOT Procedure)⁵
- D 3242 Test Method for Acidity in Aviation Turbine Fuel⁵
- D 3325 Practice for Preservation of Waterborne Oil Samples⁶
- D 3326 Practice for Preparation of Samples for Identification of Waterborne Oils⁶
- D 3328 Test Methods for Comparison of Waterborne Petroleum Oils by Gas Chromatography⁶
- D 3414 Test Method for Comparison of Waterborne Petroleum Oils by Infrared Spectroscopy⁶
- D 3699 Specification for Kerosine⁵
- D 3867 Test Methods for Nitrite-Nitrate in Water³
- D 3870 Practice for Establishing Performance Characteristics for Colony Counting Methods in Microbiology⁶
- D 4012 Test Method for Adenosine Triphosphate (ATP)

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

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² Annual Book of ASTM Standards, Vol 05.01.

³ Annual Book of ASTM Standards, Vol 11.01.

⁴ Annual Book of ASTM Standards, Vol 15.04.

⁵ Annual Book of ASTM Standards, Vol 05.02.

⁶ Annual Book of ASTM Standards, Vol 11.02.