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Standard Guide for Evaluation of Biodegradable Heat Transfer Fluids¹

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1. Scope

1.1 This guide² covers general information, without specific limits, for selecting standard test methods for evaluating heat transfer fluids for quality and aging. These test methods are considered particularly useful in characterizing biodegradable water free heat transfer fluids in closed systems.

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

2. Referenced Documents

2.1 ASTM Standards:³

- D86 Test Method for Distillation of Petroleum Products at Atmospheric Pressure
- D91 Test Method for Precipitation Number of Lubricating Oils
- D92 Test Method for Flash and Fire Points by Cleveland Open Cup Tester
- D93 Test Methods for Flash Point by Pensky-Martens Closed Cup Tester
- D95 Test Method for Water in Petroleum Products and Bituminous Materials by Distillation
- D97 Test Method for Pour Point of Petroleum Products
- D189 Test Method for Conradson Carbon Residue of Petroleum Products
- D445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)
- D471 Test Method for Rubber Property—Effect of Liquids
- D524 Test Method for Ramsbottom Carbon Residue of Petroleum Products
- D664 Test Method for Acid Number of Petroleum Products

by Potentiometric Titration

- D893 Test Method for Insolubles in Used Lubricating Oils
 - D1160 Test Method for Distillation of Petroleum Products at Reduced Pressure
 - D1298 Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
 - D1500 Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)
 - D2270 Practice for Calculating Viscosity Index from Kinematic Viscosity at 40 and 100°C
 - D2717 Test Method for Thermal Conductivity of Liquids
 - D2766 Test Method for Specific Heat of Liquids and Solids
 - D2887 Test Method for Boiling Range Distribution of Petroleum Fractions by Gas Chromatography
 - D2879 Test Method for Vapor Pressure-Temperature Relationship and Initial Decomposition Temperature of Liquids by Isoteniscope
 - D4530 Test Method for Determination of Carbon Residue (Micro Method)
 - D5864 Test Method for Determining Aerobic Aquatic Biodegradation of Lubricants or Their Components
 - D6384 Terminology Relating to Biodegradability and Ecotoxicity of Lubricants
 - D6743 Test Method for Thermal Stability of Organic Heat Transfer Fluids
 - D7044 Specification for Biodegradable Fire Resistant Hydraulic Fluids
 - E659 Test Method for Autoignition Temperature of Liquid Chemicals
 - G4 Guide for Conducting Corrosion Tests in Field Applications
- #### 2.2 OECD Standards:⁴
- Test No. 203 : Fish, Acute Toxicity Test

¹ This guide is under the jurisdiction of ASTM Committee D02 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.L0.06 on Non-Lubricating Process Fluids.

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² The background for this standard was developed by a questionnaire circulated by ASTM-ASLE technical division L-VI-2 and reported in *Lubrication Engineering*, Vol 32, No. 8, August 1976, pp. 411–416.

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.

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *fluid aging*—process of fluid degradation associated with the loss of intended performance of the fluid, which includes fluid composition changes, soot formation, and the deposit of materials on a surface (fouling).

⁴ Organisation for Economic Co-operation and Development (OECD), 2, rue André Pascal, 75775 Paris Cedex 16, France.