



Standard Guide for Evaluation of Hydrocarbon Heat Transfer Fluids¹

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1. Scope²

1.1 This guide provides information, without specific limits, for selecting standard test methods for testing heat transfer fluids for quality and aging. These test methods are considered particularly useful in characterizing hydrocarbon heat transfer fluids in closed systems.

2. Referenced Documents

2.1 ASTM Standards:

- D 86 Test Method for Distillation of Petroleum Products³
- D 91 Test Method for Precipitation Number of Lubricating Oils³
- D 92 Test Method for Flash and Fire Points by Cleveland Open Cup³
- D 93 Test Methods for Flash Point by Pensky-Martens Closed Tester³
- D 95 Test Method for Water in Petroleum Products and Bituminous Materials by Distillation³
- D 97 Test Methods for Pour Point of Petroleum Oils³
- D 189 Test Method for Conradson Carbon Residue of Petroleum Products³
- D 445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)³
- D 471 Test Method for Rubber Property—Effect of Liquids⁴
- D 524 Test Method for Ramsbottom Carbon Residue of Petroleum Products³
- D 664 Test Method for Acid Number of Petroleum Products by Potentiometric Titration³
- D 893 Test Method for Insolubles in Used Lubricating Oils³
- D 1160 Test Method for Distillation of Petroleum Products at Reduced Pressure³
- D 1298 Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid

- Petroleum Products by Hydrometer Method³
- D 1500 Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)³
- D 2160 Test Method for Thermal Stability of Hydraulic Fluids³
- D 2270 Practice for Calculating Viscosity Index from Kinematic Viscosity at 40 and 100°C³
- D 2717 Test Method for Thermal Conductivity of Liquids³
- D 2766 Test Method for Specific Heat of Liquids and Solids³
- D 2887 Test Method for Boiling Range Distribution of Petroleum Fractions by Gas Chromatography³
- D 3241 Test Method for Thermal Oxidation Stability of Aviation Turbine Fuels (JFTOT Procedure)⁵
- D 4530 Test Method for Micro Carbon Residue of Petroleum Products⁵
- E 659 Test Method for Autoignition Temperature of Liquid Chemicals⁶
- G 4 Method for Conducting Corrosion Coupon Tests in Plant Equipment⁷

3. Terminology

3.1 Description of Term Specific to This Standard:

3.1.1 *heat transfer fluid*—in this guide, a petroleum oil or related hydrocarbon material which remains essentially a liquid while transferring heat to or from an apparatus or process. Small percentages of nonhydrocarbon components such as antioxidants and dispersants can be present.

4. Significance and Use

4.1 The significance of each test method will depend upon the system in use and the purpose of the test method as listed under Section 5. Use the most recent editions of ASTM test methods.

5. Recommended Test Procedures

5.1 Pumpability of the Fluid:

5.1.1 *Flash Point*, closed cup (Test Method D 93)—This test method will detect low flash ends which are one cause of cavitation during pumping. In closed systems, especially when

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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 *Annual Book of ASTM Standards*, Vol 05.01.

⁴ *Annual Book of ASTM Standards*, Vol 09.01.

⁵ *Annual Book of ASTM Standards*, Vol 05.02.

⁶ *Annual Book of ASTM Standards*, Vol 14.02.

⁷ *Annual Book of ASTM Standards*, Vol 03.02.