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Standard Guide for Evaluation of Hydrocarbon Heat Transfer Fluids[1]

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1. Scope [2]

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:*[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
D4530 Test Method for Determination of Carbon Residue (Micro Method)
D6743 Test Method for Thermal Stability of Organic Heat Transfer Fluids
E659 Test Method for Autoignition Temperature of Liquid Chemicals
G4 Guide for Conducting Corrosion Tests in Field Applications

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *heat transfer fluid*—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 D93)—This test method will detect low flash ends which are one cause of cavitation during pumping. In closed systems, especially when fluids are exposed to temperatures of 225°C (approximately 400°F) or higher, the formation of volatile hydrocarbons by

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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.