



Standard Test Method for Indicating Wear Characteristics of Non-Petroleum and Petroleum Hydraulic Fluids in a Constant Volume Vane Pump¹

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1. Scope*

1.1 This test method covers a constant volume vane pump test procedure operated at 1200 rpm and 13.8 MPa.

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

1.2.1 *Exception*—There are no SI equivalents for the inch fasteners and inch O-rings that are used in the apparatus in this test method.

1.2.2 *Exception*—In some cases English pressure values are given in parentheses as a safety measure.

1.3 *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:²

[D2882 Test Method for Indicating Wear Characteristics of Petroleum and Non-Petroleum Hydraulic Fluids in Constant Volume Vane Pump](#) (Withdrawn 2003)³

[D6300 Practice for Determination of Precision and Bias Data for Use in Test Methods for Petroleum Products and Lubricants](#)

¹ This test method is under the jurisdiction of ASTM Committee [D02](#) on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee [D02.N0.07](#) on Lubricating Properties.

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² 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 The last approved version of this historical standard is referenced on www.astm.org.

[E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method](#)

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *flushing, v*—process of cleaning the test system before testing to prevent cross-contamination.

3.1.2 *torquing, v*—process of tightening the pump head bolts to achieve a uniform clamping force.

4. Summary of Test Method

4.1 An amount of 18.9 ± 0.5 L of a hydraulic fluid are circulated through a rotary vane pump system for 100 h at a pump speed of 1200 ± 60 r/min and a pump outlet pressure of 13.8 ± 0.3 MPa (2000 ± 40 psi). Fluid temperature at the pump inlet is $66 \pm 3^\circ\text{C}$ for all water glycols, emulsions, and other water containing fluids and for petroleum and synthetic fluids of ISO Grade 46 or lighter. A temperature of $80 \pm 3^\circ\text{C}$ is used for all other synthetic and petroleum fluids.

4.2 The result obtained is the total mass loss from the cam ring and the twelve vanes during the test. Other reported values are initial flow rate and final flow rate.

4.3 The total quantity of test oil required for a run is 26.5 L.

5. Significance and Use

5.1 This test method is an indicator of the wear characteristics of non-petroleum and petroleum hydraulic fluids operating in a constant volume vane pump. Excessive wear in vane pumps could lead to malfunction of hydraulic systems in critical applications.

6. Apparatus

6.1 The basic system consists of the following (see [Fig. 1](#)):

6.1.1 *AC Motor*; 1200-rpm, or other suitable drive, with 11 kw (15 hp) as suggested minimum power requirement (Item 5,