



Designation: D7721 – 22

Standard Practice for Determining the Effect of Fluid Selection on Hydraulic System or Component Efficiency¹

This standard is issued under the fixed designation D7721; 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 practice covers all types and grades of hydraulic fluids.

1.2 This practice is applicable to both laboratory and field evaluations.

1.3 This practice provides guidelines for conducting hydraulic fluid evaluations. It does not prescribe a specific efficiency test methodology.

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

1.5 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

D4174 Practice for Cleaning, Flushing, and Purification of Petroleum Fluid Hydraulic Systems

D4175 Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants

¹ This practice is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.N0 on Hydraulic Fluids.

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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.

2.2 ISO Standards:³

ISO 4391 Hydraulic fluid power—Pumps, motors and integral transmissions—Parameter definitions and letter symbols

ISO 4392-1 Hydraulic fluid power—Determination of characteristics of motors—Part 1: At constant low speed and constant pressure

ISO 4409 Hydraulic fluid power—Positive-displacement pumps, motors and integral transmissions—Methods of testing and presenting basic steady state performance

ISO 5598 Fluid power systems & components—Vocabulary

ISO 8426 Hydraulic fluid power—Positive displacement pumps and motors—Determination of derived capacity

3. Terminology

3.1 For additional definitions related to petroleum products and lubricants, see Terminology D4175. For additional definitions related to fluid power systems and components, see ISO 5598.

3.2 Definitions:

3.2.1 *baseline oil, n*—oil of known performance characteristics used as a basis for comparison.

3.2.1.1 *Discussion*—For purposes of this practice, the baseline oil may be a hydraulic fluid of any suitable composition.

3.2.2 *component, n—of a hydraulic system*, an individual unit, excluding piping, comprising one or more parts designed to be a functional part of a fluid power system, for example, cylinder, motor, valve, or filter.

3.2.3 *critical parts, n*—those components used in the test that are known to affect test severity.

3.2.4 *cycle time, n*—the amount of time it takes for a machine to perform a repetitive segment of an operation, typically measured as the time it takes a machine to return to the original position after completing a task.

3.2.5 *energy consumption, n*—the total energy content consumed during a test in kWh; determined from electric power meter readings or calculated from the mass of fuel consumed and the lower heating value of the fuel.

³ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.

*A Summary of Changes section appears at the end of this standard