



Designation: D7417 – 24

Standard Test Method for Analysis of In-Service Lubricants Using Particular Four-Part Integrated Tester (Atomic Emission Spectroscopy, Infrared Spectroscopy, Viscosity, and Laser Particle Counter)¹

This standard is issued under the fixed designation D7417; 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 test method covers the quantitative analysis of in-service lubricants using an automatic testing device that integrates these varied technologies: atomic emission spectroscopy, infrared spectroscopy, viscosity, and particle counting.

1.2 This is suited for in-service lubricating oils having viscosities in the range between ISO 10 and ISO 320 and properties in the ranges given in [Tables 1 and 2](#).

1.3 This test method may be used to establish trends in wear and contamination of in-service lubricants and may not give equivalent numerical results to current ASTM test methods.

1.4 This test method is not intended for use with crude oil.

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

1.6 *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. (Specific hazard statements are given in Section 9 and 11.3.)*

1.7 *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.*

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 D02.96.07 on Integrated Testers, Instrumentation Techniques for In-Service Lubricants.

Current edition approved July 1, 2024. Published July 2024. Originally approved in 2010. Last previous edition approved in 2017 as D7417 – 17. DOI: 10.1520/D7417-24.

2. Referenced Documents

2.1 ASTM Standards:²

D445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)

D2270 Practice for Calculating Viscosity Index from Kinematic Viscosity at 40 °C and 100 °C

D2896 Test Method for Base Number of Petroleum Products by Potentiometric Perchloric Acid Titration

D4057 Practice for Manual Sampling of Petroleum and Petroleum Products

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

D4739 Test Method for Base Number Determination by Potentiometric Hydrochloric Acid Titration

D6595 Test Method for Determination of Wear Metals and Contaminants in Used Lubricating Oils or Used Hydraulic Fluids by Rotating Disc Electrode Atomic Emission Spectrometry

D7042 Test Method for Dynamic Viscosity and Density of Liquids by Stabinger Viscometer (and the Calculation of Kinematic Viscosity)

E2412 Practice for Condition Monitoring of In-Service Lubricants by Trend Analysis Using Fourier Transform Infrared (FT-IR) Spectrometry

2.2 ISO Standards:³

ISO 4406:99 Hydraulic Fluid Power Solid Contaminations Code

ISO 11171 Automatic Particle Counter Calibration Procedures

3. Terminology

3.1 Definitions:

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

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