



Designation: D7450 – 24

Standard Specification for Performance of Rear Axle Gear Lubricants Intended for API Category GL-5 Service¹

This standard is issued under the fixed designation D7450; 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 specification covers test methods and acceptance criteria for determining the acceptability of gear oils for applications that specify a lubricant meeting the performance requirements of API Category GL-5 service. Lubricants that meet these performance requirements are typically intended for use in automotive axles, particularly those containing hypoid gears, operating under various combinations of high-speed/shock-load and low-speed/high-torque conditions.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

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

1.4 *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

- D130 Test Method for Corrosiveness to Copper from Petroleum Products by Copper Strip Test
- D892 Test Method for Foaming Characteristics of Lubricating Oils
- D5704 Test Method for Evaluation of the Thermal and

Oxidative Stability of Lubricating Oils Used for Manual Transmissions and Final Drive Axles

D6121 Test Method for Evaluation of Load-Carrying Capacity of Lubricants Under Conditions of Low Speed and High Torque Used for Final Hypoid Drive Axles

D7038 Test Method for Evaluation of Moisture Corrosion Resistance of Automotive Gear Lubricants

D7452 Test Method for Evaluation of the Load Carrying Properties of Lubricants Used for Final Drive Axles, Under Conditions of High Speed and Shock Loading

D8165 Test Method for Evaluation of Load-Carrying Capacity of Lubricants Used in Hypoid Final-Drive Axles Operated under Low-Speed and High-Torque Conditions

2.2 Military Standards:³

MIL-L-2105C Lubricating Oil, Gear, Multipurpose

MIL-L-2105D Lubricating Oil, Gear, Multipurpose

MIL-PRF-2105E Lubricating Oil, Gear, Multipurpose

2.3 SAE Documents:⁴

J306 Automotive Gear Lubricant Viscosity Classification

J2360 Lubricating Oil, Gear Multipurpose (Metric) Military Use

3. Terminology

3.1 Definitions:

3.1.1 *pitting, n*—on ring and pinion gears, small irregular cavities in the tooth surface, resulting from the breaking out of small areas of surface metal. **D6121**

3.1.2 *ridging, n*—on ring and pinion gears, an alteration of the tooth surface to give a series of parallel raised and polished ridges running diagonally in the direction of sliding motion, either partially or completely across the tooth surfaces of gears. **D6121**

3.1.3 *rippling, n*—on ring and pinion gears, an alteration of the tooth surface to give an appearance of a more or less regular pattern resembling ripples on water or fish scales. **D6121**

¹ This specification is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.B0 on Automotive Lubricants.

Current edition approved Dec. 1, 2024. Published December 2024. Originally approved in 2008. Last previous edition approved in 2019 as D7450 – 19. DOI: 10.1520/D7450-24.

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 Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://www.dodssp.daps.mil>

⁴ Available from Society of Automotive Engineers (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001, <http://www.sae.org>.

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