



Designation: D8227 – 18

Standard Test Method for Determining the Coefficient of Friction of Synchronizer Lubricated by Mechanical Transmission Fluids (MTF) Using a High-Frequency, Linear-Oscillation (SRV) Test Machine¹

This standard is issued under the fixed designation D8227; 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 a procedure for determining the coefficient of friction of lubricants (fluids) tribologically interacting with materials used in synchronizers in mechanical transmission (MT) gears under high-frequency linear-oscillation motion using the SRV test machine. A flat areal contact geometry is applied.

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

1.3 *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

D235 Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)

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

D5579 Test Method for Evaluating the Thermal Stability of Manual Transmission Lubricants in a Cyclic Durability Test

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.L0 on Industrial Lubricants and Engineering Sciences of High Performance Fluids and Solids.

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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.

D5706 Test Method for Determining Extreme Pressure Properties of Lubricating Greases Using a High-Frequency, Linear-Oscillation (SRV) Test Machine

D7421 Test Method for Determining Extreme Pressure Properties of Lubricating Oils Using High-Frequency, Linear-Oscillation (SRV) Test Machine

G40 Terminology Relating to Wear and Erosion

2.2 Other Standards:

DIN 51631 Special-boiling-point spirits—Requirements and testing³

DIN EN ISO 13565-2 Geometrical Product Specifications (GPS)—Surface texture: Profile method—Surfaces having stratified functional properties—Part 2: Height characterization using linear material ratio curve³

DIN EN 17022-3 Heat treatment of ferrous materials; heat treatment methods; case hardening³

CEC L-66-99 Evaluation of synchronizer loading parameters and their ability to predict failure⁴

GB/T 3077-2015 Alloy structural steel⁵

YS/T 669-2013 Copper alloy tube of extruded product for synchronizer rings⁶

TL-VW084 (1993) Kupfer-Zink-Legierungen – Werkstoffanforderungen (Copper-Zinc alloys—Material requirements)⁷

3. Terminology

3.1 Definitions:

3.1.1 *break-in, n—in tribology*, an initial transition process occurring in newly established wearing contacts, often accompanied by transients in coefficient of friction or wear rate, or

³ Available from Beuth Verlag GmbH (DIN Deutsches Institut für Normung e.V.), Burggrafenstrasse 6, 10787 Berlin, Germany, <http://www.en.din.de>

⁴ Available from Coordinating European Council (CEC), Services provided by Kellen Europe, Avenue Jules Bordet 142 - 1140, Brussels, Belgium, <http://www.cectests.org>.

⁵ Available from Standardization Administration of China, No. 9 Madian Donglu, Haidian District, Beijing 100088, P.R. China.

⁶ Available as a standard of nonferrous industry from Standardization Administration of China, No. 9 Madian Donglu, Haidian District, Beijing 100088, P.R. China.

⁷ Available from Volkswagen AG, corporate IP, post stop 1770, D-38346 Wolfsburg, Germany, www.vwgroupsupply.com.