



Standard Test Method for Corrosiveness to Silver by Automotive Spark-Ignition Engine Fuel–Silver Strip Method¹

This standard is issued under the fixed designation D7671; 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 determination of the corrosiveness to silver by automotive spark-ignition engine fuel, as defined by Specification [D4814](#), or similar specifications in other jurisdictions, having a vapor pressure no greater than 124 kPa (18 psi) at 37.8 °C (100 °F), by one of two procedures. Procedure A involves the use of a pressure vessel, whereas Procedure B involves the use of a vented test tube.

1.2 The result of the test is based on a visual rating that is classified as an integer in the range from 0 to 4 as defined in [Table 1](#).

1.3 The values stated in SI units are to be regarded as the standard. The values in parentheses are for information only.

1.4 *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.* For specific warning statements, see [6.1](#) and Section [7](#).

2. Referenced Documents

2.1 ASTM Standards:²

[D130](#) Test Method for Corrosiveness to Copper from Petroleum Products by Copper Strip Test

[D3241](#) Test Method for Thermal Oxidation Stability of Aviation Turbine Fuels

[D4057](#) Practice for Manual Sampling of Petroleum and Petroleum Products

[D4177](#) Practice for Automatic Sampling of Petroleum and Petroleum Products

[D4814](#) Specification for Automotive Spark-Ignition Engine Fuel

[E1](#) Specification for ASTM Liquid-in-Glass Thermometers

2.2 *Energy Institute Standard:*

[IP 227](#) Determination of Corrosiveness to Silver of Aviation Turbine Fuels–Silver Strip Method³

2.3 *ASTM Adjuncts:*

Color Standard for Tube Deposit Rating⁴

3. Summary of Test Method

3.1 This test method covers two procedures. Procedure A involves the use of a pressure vessel (to prevent the loss of volatile components in the sample), whereas Procedure B involves the use of a vented test tube. In both procedures, a freshly polished silver strip is suspended in 30 mL of sample which is heated to 50 °C $\pm$ 1 °C for a duration of 3 h $\pm$ 5 min. At the end of the heating period, the silver strip is removed, washed and the color and tarnish level assessed against the requirements in [Table 1](#).

4. Significance and Use

4.1 Crude petroleum contains sulfur compounds, most of which are removed during refining. However, of the sulfur compounds remaining in the petroleum product, some can have a corroding action on various metals and this corrosivity is not related to the total sulfur content. In addition, fuels can become contaminated by corrosive sulfur compounds during storage and distribution. The corrosive effect can vary according to the chemical types of sulfur compounds present.

4.2 The silver strip corrosion test is designed to assess the relative degree of corrosivity of a petroleum product towards silver and silver alloys.

4.3 Reactive sulfur compounds present in automotive spark-ignition engine fuels under some circumstances can corrode or tarnish silver alloy fuel gauge in-tank sender units (and silver-plated bearings in some 2-stroke cycle engines). To minimize or prevent the failure of silver alloy in-tank sender

¹ This test method is under the jurisdiction of ASTM Committee [D02](#) on Petroleum Products, Liquid Fuels, and Lubricants and are the direct responsibility of Subcommittee [D02.05.0C](#) on Color and Reactivity.

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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 Withdrawn without replacement in 2001. Copies of IP 227/99 can be obtained at The Publications Department, Energy Institute, 61 New Cavendish Street, London, W1G 7AR, United Kingdom.

⁴ Available from ASTM International Headquarters. Order Adjunct No. [ADJD3241](#). Original adjunct produced in 1986.