



Designation: ~~D1662–08 (Reapproved 2014)~~ D1662–19

## Standard Test Method for Active Sulfur in Cutting Oils<sup>1</sup>

This standard is issued under the fixed designation D1662; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope\*

1.1 This test method covers the determination of active sulfur in cutting oils. This test method applies to sulfur reactive with copper powder at a temperature of  ~~$\pm 50^{\circ}\text{C}$  ( $302^{\circ}\text{F}$ )~~  $150^{\circ}\text{C}$  ( $302^{\circ}\text{F}$ ) in cutting fluids containing both natural and added sulfur.

NOTE 1—It has not been established by ASTM Subcommittee D02.L0 as to how the active sulfur content thus determined may relate to field performance of the cutting fluid.

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

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 ~~health~~ 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:<sup>2</sup>

D130 Test Method for Corrosiveness to Copper from Petroleum Products by Copper Strip Test

### 3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *active sulfur*—sulfur in a cutting fluid that will react with metallic copper at a temperature of  ~~$\pm 50^{\circ}\text{C}$  ( $302^{\circ}\text{F}$ )~~  $150^{\circ}\text{C}$  ( $302^{\circ}\text{F}$ ) under the prescribed conditions.

### 4. Summary of Test Method

4.1 A portion of the sample is treated with copper powder at  ~~$\pm 50^{\circ}\text{C}$  ( $302^{\circ}\text{F}$ )~~  $150^{\circ}\text{C}$  ( $302^{\circ}\text{F}$ ). The copper powder is filtered from the mixture. Active sulfur is expressed as the difference between the sulfur contents of the sample, as determined before and after treatment with copper.

### 5. Significance and Use

5.1 This test method measures the quantity of sulfur available to react with metallic surfaces to form solid lubricating aids at the temperature of the test. Rates of reaction are metal type, temperature, and time dependent.

### 6. Apparatus

6.1 *Filter Paper*, ~~2.5  $\mu\text{m}$~~  2.5  $\mu\text{m}$  retention size.

6.2 *Stirrer*, constructed of glass in the form of an inverted T. A flat blade, approximate length ~~25 mm~~, height ~~6 mm~~, thickness ~~1 mm~~, 25 mm, height 6 mm, thickness 1 mm, shall be attached to a glass rod ~~6 mm~~ 6 mm in diameter, in such a way that the blade

<sup>1</sup> 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.L0.01 on Metal Removal Fluids and Lubricants.

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This test method was prepared under the joint sponsorship of the American Society of Lubrication Engineers (ASLE) and accepted by ASLE in January 1969.

<sup>2</sup> 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.

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