



Designation: D6203 – 17

## Standard Test Method for Thermal Stability of Way Lubricants<sup>1</sup>

This standard is issued under the fixed designation D6203; 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 evaluation of the thermal stability of hydrocarbon-based way lubricants, although oxidation may occur during the test.

1.2 The values stated in SI units are to be regarded as standard.

1.2.1 *Exception*—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 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>

D4057 Practice for Manual Sampling of Petroleum and Petroleum Products

2.2 *Other Standards:*

UNS C11000 Electrolytic Tough Pitch Copper<sup>3</sup>

AISI W1 1% Carbon Tool Steel<sup>4</sup>

### 3. Summary of Test Method

3.1 A beaker containing test oil and copper and steel rods is placed in a gravity convection electric oven for 24 h at a test

<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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<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.

<sup>3</sup> Available from Copper Development Assoc., 2 Greenwich Office Park, Box 1840, Greenwich, CT 06836.

<sup>4</sup> Available from American Iron and Steel Institute (AISI), 1140 Connecticut Ave., NW, Suite 705, Washington, DC 20036, http://www.steel.org.

temperature of 100 °C. At the completion of the test, the copper and steel rods are visually rated for discoloration and the beaker is visually evaluated for deposits.

### 4. Significance and Use

4.1 Thermal stability characterizes physical and chemical property changes which may adversely affect an oil's lubricating performance. This test method evaluates the thermal stability of a way lubricant in the presence of copper and steel rods at 100 °C. Deposits and rod colors are the evaluation criteria. No correlation of the test to field service has been made.

4.2 This test method is intended for use in qualifying a way lubricant, rather than for quality control or condition monitoring purposes.

### 5. Apparatus

5.1 *Gravity Convection Electric Oven*, capable of maintaining the samples at a test temperature of 100 °C ± 2 °C.

5.2 *Calibrated Temperature Indicator*, suitable for measuring and controlling the oven temperature.

5.3 *Griffin Beakers*, borosilicate glass, 100 mL.

5.4 *Copper Test Specimens*, in accordance with UNS C11000, 99.9 % pure electrolytic tough pitch copper, 6.4 mm in diameter by 7.6 cm in length (0.25 in. by 3.0 in.).

5.5 *Steel Test Specimens*, in accordance with AISI W1 1 % carbon steel, 6.4 mm in diameter by 7.6 cm in length (0.25 in. by 3.0 in.).

5.6 *Silicon Carbide Abrasive*, 320 grit with cloth backing.

5.7 *Crocus Cloth*.

5.8 *Fives Cincinnati Color Chart*.<sup>5</sup>

5.9 *Facial Tissue*.

<sup>5</sup> The sole source of supply of the apparatus known to the committee at this time is Fives Cincinnati, Lubricants Laboratory, 2200 Litton Lane, Hebron, KY 41048; www.Fivesmsi.com or by e-mail at FMS.LubricantsLab@FIVESGROUP.com. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,<sup>1</sup> which you may attend.

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