



Designation: D6594 – 19a

## Standard Test Method for Evaluation of Corrosiveness of Diesel Engine Oil at 135 °C<sup>1</sup>

This standard is issued under the fixed designation D6594; 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.

### INTRODUCTION

Any properly equipped laboratory, without outside assistance, can use the procedure described in this test method. However, the ASTM Test Monitoring Center (TMC)<sup>2</sup> provides reference oils and an assessment of the test results obtained on those oils by the laboratory (see [Annex A1](#)). By these means, the laboratory will know whether their use of the test method gives results statistically similar to those obtained by other laboratories. Furthermore, various agencies require that a laboratory utilize the TMC services in seeking qualification of oils against specifications. For example, the U.S. Army imposes such a requirement in connection with several Army engine lubricating oil specifications.

Accordingly, this test method is written for use by laboratories that utilize the TMC services. Laboratories that choose not to use those services may simply ignore those portions of the test method that refer to the TMC.

This test method may be modified by means of information letters issued by the TMC. In addition, the TMC may issue supplementary memoranda related to the method (see [Annex A1](#)). For other information, refer to the research report of this test method.<sup>3</sup>

### 1. Scope\*

1.1 This test method covers testing diesel engine lubricants to determine their tendency to corrode various metals, specifically alloys of lead and copper commonly used in cam followers and bearings.

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 standard-*

*ization 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>4</sup>

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

[D5185](#) Test Method for Multielement Determination of Used and Unused Lubricating Oils and Base Oils by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)

[D5844](#) Test Method for Evaluation of Automotive Engine Oils for Inhibition of Rusting (Sequence IID) (Withdrawn 2003)<sup>5</sup>

[D6557](#) Test Method for Evaluation of Rust Preventive Characteristics of Automotive Engine Oils

### 3. Terminology

3.1 *Definitions:*

<sup>4</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>5</sup> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).

<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.B0.02 on Heavy Duty Engine Oils.

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<sup>2</sup> The ASTM Test Monitoring Center will update changes in this test method by means of Information Letters. This edition incorporates revisions contained in all Information Letters through 19-1. Information Letters may be obtained from the ASTM Test Monitoring Center, 6555 Penn Ave., Pittsburgh, PA 15206-4489, Attention: Administrator.

<sup>3</sup> Supporting data have been filed at ASTM International Headquarters and may be obtained by requesting Research Report RR:D02-1443. Contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org).

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

3.1.1 *corrosion, n*—the chemical or electrochemical reaction between a material, usually a metal surface, and its environment that can produce a deterioration of the material and its properties. **D5844**

3.1.2 *developer, n—of an ASTM test method*, the assigned ASTM group, working under the supervision of its governing subcommittee and main committee, that formats the test method in accordance with the Form and Style for ASTM Standards, and continually refines the test method.

3.1.3 *developer, n—of a test procedure*, an individual or organization that selects the test apparatus and operating conditions.

3.1.4 *non-reference oil, n*—any oil other than a reference oil; such as a research formulation, commercial oil, or candidate oil. **D5844**

3.1.5 *reference oil, n*—an oil of known performance characteristics, used as a basis for comparison. **D5844**

3.1.5.1 *Discussion*—Reference oils are used to calibrate testing facilities, to compare the performance of other oils, or to evaluate other materials (such as seals) that interact with oils.

3.1.6 *specimen, n*—a piece or portion of a sample used to make a test.

3.1.7 *sponsor, n—of an ASTM test method*, an organization that is responsible for ensuring supply of the apparatus used in the test procedure portion of the test method.

3.1.7.1 *Discussion*—In some instances, such as a test method for chemical analysis, an ASTM working group can be the sponsor of a test method. In other instances, a company with a self-interest may or may not be the developer of the test procedure used within the test method, but is the sponsor of the test method.

3.1.8 *test oil, n*—any oil subjected to evaluation in an established procedure. **D6557**

## 4. Summary of Test Method

4.1 Four metal specimens of copper, lead, tin, and phosphor bronze are immersed in a measured amount of engine oil. The oil, at an elevated temperature, is blown with air for a period of time. When the test is completed, the copper specimen and the stressed oil are examined to detect corrosion and corrosion products, respectively.

4.2 A reference oil is tested with each group of tests to verify test acceptability.

## 5. Significance and Use

5.1 This test method is intended to simulate the corrosion process of non-ferrous metals in diesel lubricants. The corrosion process under investigation is that believed to be induced primarily by inappropriate lubricant chemistry rather than lubricant degradation or contamination. This test method has been found to correlate with an extensive fleet database containing corrosion-induced cam and bearing failures.<sup>3</sup>

## 6. Apparatus

6.1 The main apparatus consists of the following items of standard wall borosilicate glassware as shown in Figs. 1-6.

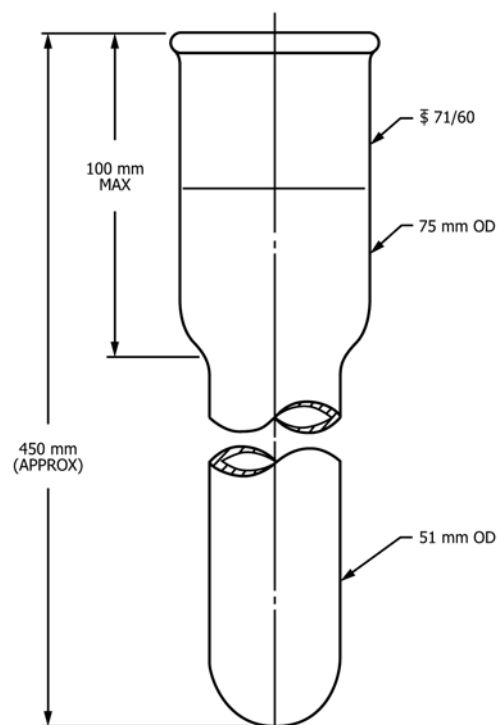


FIG. 1 Sample Tube

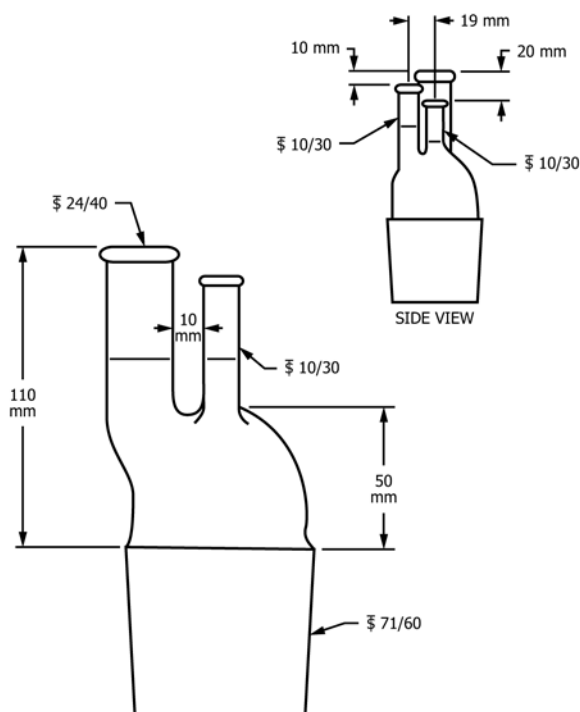


FIG. 2 Sample Tube Head

6.1.1 *Main Sample Tube*, Fig. 1.

6.1.2 *Sample Tube Head*, Fig. 2.

6.1.3 *Air Tube*, Fig. 3.

6.1.4 *Thermocouple Tube*, Fig. 4.

6.1.5 *Condenser, Allihn Type*, Fig. 5.

6.1.6 *Assembled Apparatus*, Fig. 6.

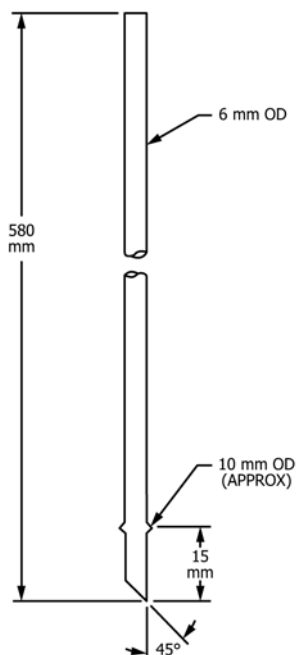


FIG. 3 Air Tube

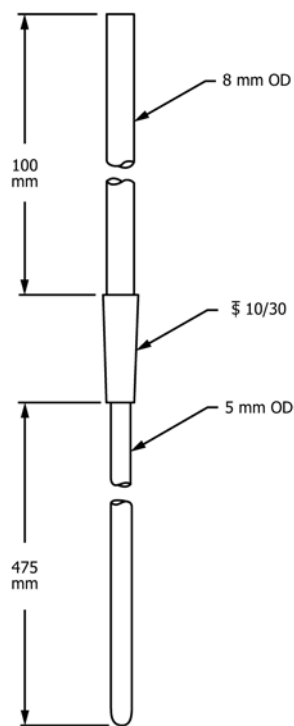


FIG. 4 Thermocouple Tube

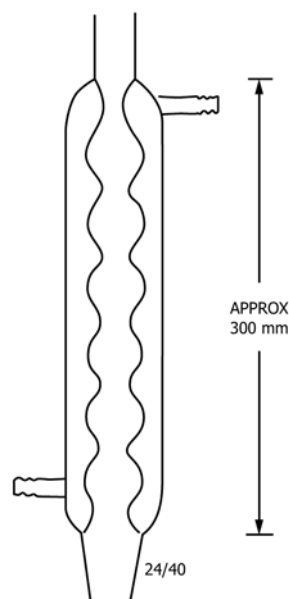


FIG. 5 Condenser, Allihn Type

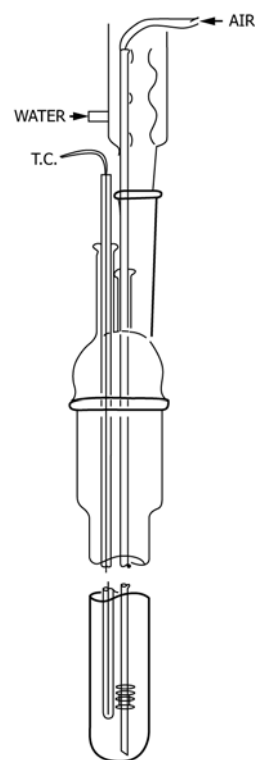


FIG. 6 Assembled Apparatus

6.2 Additional glassware items and assembly accessories needed are:

6.2.1 *Hanger* (for metal specimens), of stainless steel, having the dimensions listed in Fig. 7.

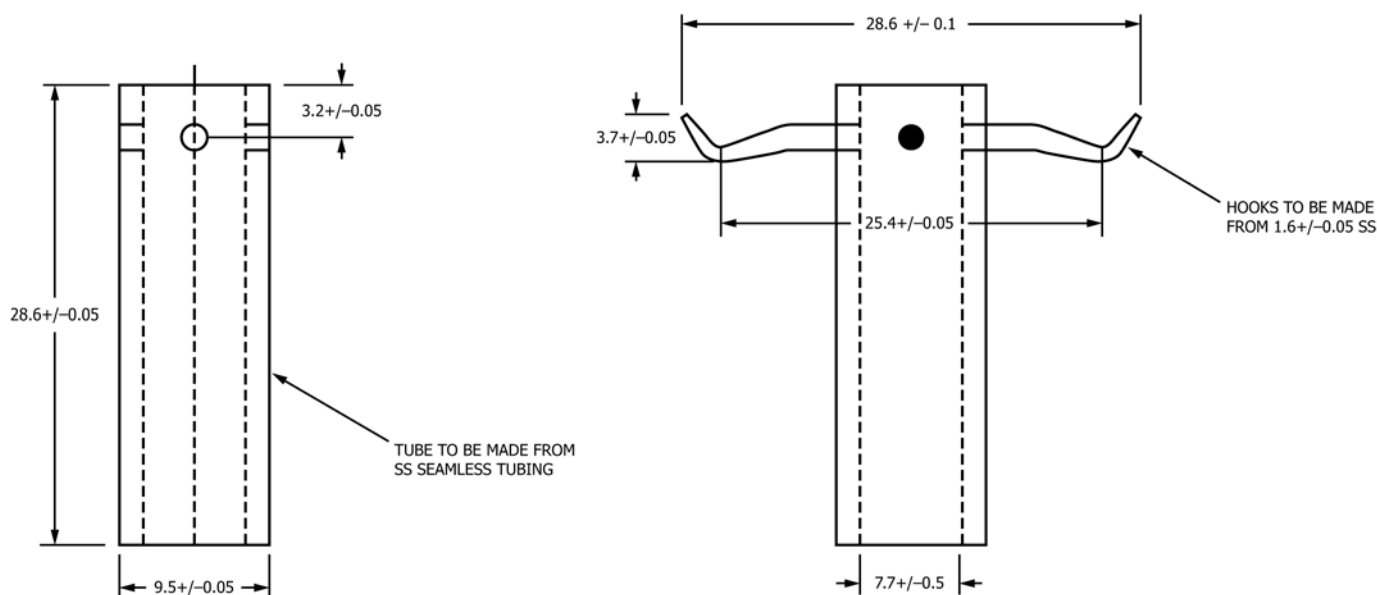
6.2.2 *Adapter*, polytetrafluoroethylene for 10/18 joint for sealing of the air tube to the sample tube head.

6.3 Other items and equipment are:

6.3.1 Heating bath, with constant temperature control within  $\pm 0.5^\circ\text{C}$  of test temperature with an immersion depth of 23 cm to 35 cm. Oil baths are recommended. (**Warning**—There are exposed hot surfaces on apparatus. Avoid skin contact by use of protective equipment.)

6.3.2 *Ventilation*, to adequately remove fumes during heating.

6.3.3 *Air Supply*, use air from a clean, dry source.



NOTE 1—All dimensions in mm.

FIG. 7 Specimen Hanger

6.3.3.1 An air drier is required when air needs to be conditioned. The method used is optional provided the air characteristics of 6.3.3 are attained. For drying, a satisfactory method is the use of a glass column containing 8-mesh anhydrous calcium sulfate with a column diameter such that velocity of air does not exceed 1.2 m/min.

6.3.4 *Flowmeter*, capable of measuring 10 L/h  $\pm$  1 L/h.

6.3.5 *Syringe*, capable of accurately measuring out 100 mL of liquid.

6.3.6 *Oven*, optional, to dry glassware at elevated temperature.

6.3.7 *Forceps*, stainless steel; or gloves (powder free).

6.3.8 *Thermocouple*, or equivalent. Use sheathed thermocouple when the thermocouple is in direct contact with oil. When a thermocouple well is used, use a sheathed or un-sheathed thermocouple in the well to control sample temperature; fill thermocouple well with a heat transfer medium.

6.3.9 *Sanding Block and Holder*, for specimen preparation.

## 7. Reagents and Materials

7.1 *Purity of Reagents*—Use reagent grade chemicals in all tests. Unless otherwise indicated, it is intended that all reagents conform to the specifications maintained by the Committee on Analytical Reagents of the American Chemical Society.<sup>6</sup>

7.2 *Metal Specimens*<sup>7,8</sup>

<sup>6</sup> *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC. For Suggestions on the testing of reagents not listed by the American Chemical Society, see *Annual Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopeia and National Formulary*, U.S. Pharmacopeial Convention, Inc. (USPC), Rockville, MD.

<sup>7</sup> Obtain metal specimens from Test Engineering, Inc. (TEI), 12718 Cimarron Path, San Antonio, TX 78249-3423.

7.2.1 Specimens are 0.081 cm thick by 2.5 cm square, except the lead specimen, which is 0.157 cm thick. One specimen from each of the following metal types, each with two drilled holes (as shown in Fig. 7), is required:

7.2.1.1 *Copper* (R401-A),

7.2.1.2 *Lead* (R401-lead),

7.2.1.3 *Tin* (R401-tin), and

7.2.1.4 *Phosphor Bronze* (R401-PBz).

7.3 *Abrasive Paper*,<sup>9</sup> 240-grit aluminum oxide and 400-grit silicon carbide. Do not use iron-containing abrasives such as natural emery.

7.4 *Cotton*, 100 %.

7.5 *Acetone* (ACS), sulfur free. (**Warning**—Flammable. Health hazard.)

7.6 *Glassware Cleaning Solution*, Contrad (trademark) 70.<sup>10,8</sup> (**Warning**—Health hazard.)

7.7 *Heptane*. (**Warning**—Flammable. Health hazard.)

7.8 *Cleaning Solvent*—Cyclohexane or heptane, industrial grade. (**Warning**—Both are flammable and health hazards.)

7.9 *Reference Oil*.<sup>2</sup>

## 8. Preparation of Apparatus

8.1 *Cleaning*:

<sup>8</sup> The sole source of supply of the apparatus known to the committee at this time is noted in the adjoining footnote. 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.

<sup>9</sup> Suitable abrasive paper meeting these specifications is included with the metal specimens when the specimens are ordered.

<sup>10</sup> Contrad 70 is available from Decon Laboratories, Inc., 460 Glennie Circle, King of Prussia, PA 19406, (800) 332-6647.

8.1.1 Rinse all items and the air tube adapter with cleaning solvent to remove residual oil, and air-dry.

8.1.2 Wash all glassware items and the air tube adapter with detergent. Rinse with tap water, distilled water, and dry.

8.1.3 The following more thorough glassware cleaning procedure can be used, if it is required for a given situation:

8.1.3.1 Fill and immerse all glassware items with glassware cleaning solution (see 7.6) and soak for 3 h to 16 h. (**Warning**—Corrosive, causes severe burns.)

8.1.3.2 Remove glassware from cleaning solution; rinse several times with tap water, followed by distilled water, and oven-dry.

8.1.3.3 This more thorough glass cleaning procedure is necessary in a referee situation, unless an alternative glassware cleaning solution is available that is satisfactory to all parties involved.

8.2 *Assembled Apparatus*, shown in Fig. 6.

8.3 *Preparation of Metal Specimens*:

8.3.1 In all succeeding steps, handle the specimens only with stainless steel forceps or powder-free gloves until the final weighing. If large defects or particles are present on the metal specimens, remove them first using coarse sandpaper, followed by polishing with the 240 and 400-grit abrasive papers, as described in 8.3.2.

8.3.2 Remove any burrs from the drilled holes with a 1.5113 mm, #53 (drill wire gauge) drill bit. Using a sanding block with a specimen holder, remove all surface blemishes from both sides and all four edges of each specimen with 240-grit abrasive paper. Finish polishing with 400-grit paper wetted by acetone to remove marks from previous polishing.

8.3.2.1 A good technique is to rub the specimen with longitudinal strokes in a direction perpendicular to that used with 240-grit paper. Use a different sheet of paper for each metal type.

8.3.2.2 Make sure that the specimen edges are polished in the same manner as the surfaces. Carry out this procedure using normal room lighting and without magnification of the specimen surface. Do not scribe or otherwise mark the surfaces.

8.3.3 Store the polished metal specimens in acetone.

8.3.4 Just prior to a test start, remove each specimen from the acetone, and clean all metal dust from the specimen using 100 % cotton. Rub with a light-to-medium touch to remove particles but do not polish the specimen further.

8.3.5 Wash specimens in acetone, and allow them to dry in a desiccator.

## 9. Procedure

9.1 Add 100 mL  $\pm$  1 mL of oil to the sample tube by syringe.

9.2 Place the specimen hanger onto the air tube, and hang test specimens on their respective hooks.

9.2.1 Arrange the specimens on the hanger in the sequence: lead, copper, tin, and phosphor bronze.

9.3 Insert the air tube with the attached specimens into the sample tube so that the air tube rests on the bottom of the sample tube.

9.4 Place the sample tube head on the sample tube.

9.5 Place the assembled sample tube and condenser into the bath so that the sample tube is submerged 23 cm to 35 cm in the bath with the test oil temperature set at 135 °C  $\pm$  0.5 °C.

9.6 Start the flow of the cooling water through the condenser jacket.

9.7 To begin testing, connect the source of clean, dry air 5 L/h  $\pm$  0.5 L/h to the air tube and allow the air to flow for 168 h. Use a calibrated flow meter in setting airflow rates.

9.8 *End of Test*—After 168 h at 135 °C, shut off the airflow and disassemble.

9.8.1 Remove air supply and disconnect condenser.

9.8.2 Remove sample tube from the bath, and allow it to cool to room temperature.

## 10. Test Results

10.1 Remove the air tube with the attached specimens from the sample tube. Do not touch the specimens with hands. Retain the sample tube and test oil for further examination.

10.2 Using forceps, wash the copper specimen in heptane, and discard the other specimens.

10.3 Rate the copper specimen for tarnish according to the Strip Examination, Interpretation, and Report sections of Test Method D130.

10.4 Immediately after calibration of the ICP-AES instrument (as specified in Test Method D5185), use Test Method D5185 to determine the concentration of copper, lead, and tin in both the new and used oil. No decimal results shall be recorded.

10.4.1 Any measured concentration results that round to zero shall be reported as zero.

10.5 *Calculations*—Change in metal concentration in the used test oil:

$$\Delta C = C_2 - C_1 \quad (1)$$

where:

$\Delta C$  = change in metal concentration before and after test,

$C_1$  = measurement of metal concentration in new test oil (as determined in 10.4), and

$C_2$  = measurement of metal concentration in used test oil (as determined in 10.4).

10.5.1 Round all concentration change results to the nearest whole number and record this value as the test result.

## 11. Reference Oil Testing

11.1 Test a TMC-coded reference oil along with each batch of non-reference oil tests. Run the reference oil simultaneously with, and in the same bath as, the non-reference oils.

NOTE 1—Annex A1 discusses the involvement of the ASTM TMC with respect to the reference test-monitoring program.

11.1.1 Prior to requiring a reference oil test, procure a supply of reference oils directly from the TMC. These oils have been formulated or selected to represent specific chemistry types, or performance levels, or both. Each reference oil sample is identified using a unique set of identification codes



on the container labels. The coded reference samples provide for a blind reference-testing program to protect against the possibility of bias in the results.

11.1.1.1 The testing laboratory tacitly agrees to use the TMC reference oils exclusively in accordance with the TMC's published Policies for Use and Analysis of ASTM Reference Oils, and to run and report the reference oil test according to TMC guidelines.

NOTE 2—Policies for the Use and Analysis of ASTM Reference Oils is available from the TMC.

11.1.2 Request a reference oil assignment from the TMC for this test method. The TMC determines the specific reference oil to be tested by the laboratory. Assignments are made by the unique identifying codes on the reference oil container labels. Provide the TMC with the bath identification number for the test.

11.1.3 Run the TMC reference oil test according to the test method and in the same manner as the non-reference oil test(s).

11.1.4 *Reporting of Reference Oil Test Results*—Report the results of all reference oil tests to the TMC according to the following directives:

11.1.4.1 Use the data reporting formats detailed in **Annex A2** for reporting all TMC reference oil test data to the TMC. Report only the reference oil results to the TMC. Do not include any non-reference test data. Complete all of the required blank fields on the forms. The report forms and data dictionary are available on the ASTM Test Monitoring Center Web Page at <http://www.astmtmc.cmu.edu/> or can be obtained in hardcopy format from the TMC.

11.1.4.2 Transmit reference test data to the TMC by electronic means or by telephone facsimile immediately upon completion of the test analysis. Include all of the reporting forms in the transmission.

NOTE 3—Specific protocols for the electronic transmission of test data to the TMC are available from the TMC.

11.1.5 *Evaluation of Reference Test Oil Results*—Upon receipt of the transmitted TMC reference oil test results, the TMC reviews the test for operational adherence to the published test method. If the test is found to be operationally valid, the reference oil results are evaluated using acceptance criteria established by the governing surveillance panel. The reference oil acceptance criteria are subject to change at the discretion of the surveillance panel.

11.1.5.1 If the transmitted test is found to be both operationally valid and statistically acceptable, the testing laboratory is notified of the acceptable status of the reference test. The uncoded TMC reference oil identification is also disclosed to the testing laboratory.

11.1.5.2 In the event that a TMC reference oil test is found to be unacceptable, an explanation of the problem relating to the failure is provided to the testing laboratory. If there is an obvious operational reason for the failed test, correct the problem before requesting another TMC reference oil assignment. If the reason for the failure is not obvious, recheck all test-related equipment for compliance to the test method and good laboratory practice. Following this re-check, the TMC assigns another TMC reference oil for testing.

11.1.6 *Status of Non-reference Oil Tests Relative to TMC Reference Oil Tests*—The batch of non-reference tests is considered valid only if the results of the TMC reference oil test meet the predetermined acceptance specifications for the particular reference oil tested.

11.2 *Donated Reference Oil Test Programs*—The surveillance panel is charged with maintaining effective reference oil test severity and precision monitoring. During times of new parts introductions, new or re-blended reference oil additions, and procedural revisions, it might be necessary to evaluate the possible effects on severity and precision levels. The surveillance panel might choose to conduct a program of donated reference oil tests in those laboratories participating in the monitoring system, in order to quantify the effect of a particular change on severity and precision. Typically, the surveillance panel requests its panel members to volunteer enough reference oil test results to create a robust data set. Broad laboratory participation is needed to provide a representative sampling of the industry. To ensure the quality of the data obtained, donated tests are conducted on calibrated test baths. The surveillance panel shall arrange an appropriate number of donated tests and ensure completion of the test program in a timely manner.

## 12. Report

12.1 Report (see **Annex A2** for Report Format) the tarnish rating of the copper specimen (as determined in **10.3**) based on the highest rating (most corrosion) if the rating is different for either side.

12.2 Report the concentrations of copper and lead in the new oil ( $C_1$  in **10.5**) and stressed oil ( $C_2$  in **10.5**), and the respective changes in metal concentrations ( $\Delta C$  in **10.5**).

12.3 The “less than” symbol shall not be used when reporting any concentration result.

12.3.1 Decimal values for the metals concentration results are shown in the data dictionary for reporting of results completed prior to July 1, 2019. All results after this date shall be reported in whole numbers only.

## 13. Precision and Bias

13.1 *Test Precision—Reference Oils:*

13.1.1 *Intermediate Precision Conditions*—Conditions where test results are obtained with the same test method using the same test oil, with changing conditions such as operators, measuring equipment, test stands, test engines, and time.

NOTE 4—Intermediate precision is the appropriate term for this method rather than repeatability which defines more rigorous within-laboratory conditions.

13.1.1.1 *Intermediate Precision Limit (i.p.)*—The difference between two results obtained under intermediate precision conditions that would, in the long run, in the normal and correct conduct of the test method, exceed the values shown in **Table 1** in only one case in twenty. When only a single test result is available, the Intermediate Precision Limit can be used to calculate a range (test result  $\pm$  Intermediate Precision Limit) outside of which a second test result would be expected to fall about one time in twenty.

**TABLE 1 Reference Oil Statistics<sup>A</sup>**

Test Result	Intermediate Precision		Reproducibility	
	$S_{i.p.}$	i.p.	$S_R$	R
$\Delta$ Copper, mg/kg <sup>B</sup>	0.318	0.890	0.349	0.977
$\Delta$ Lead, mg/kg	15.54	43.51	17.16	48.05

Legend:

$S_{i.p.}$  = intermediate precision standard deviation  
i.p. = intermediate precision limit<sup>C</sup>  
 $S_R$  = reproducibility standard deviation  
R = reproducibility limit<sup>C</sup>

<sup>A</sup> These statistics are based on results obtained on Test Monitoring Center Reference Oils 42 and 1005.

<sup>B</sup> This parameter is transformed using a natural log. When comparing two test results on this parameter, first apply this transformation to each test result. Compare the absolute difference between the transformed results with the appropriate (intermediate or reproducibility) precision limit.

<sup>C</sup> This value is obtained by multiplying the standard deviation by 2.8.

**13.1.2 Reproducibility Conditions**—Conditions where test results are obtained with the same test method using the same test oil in different laboratories with different operators using different equipment.

**13.1.2.1 Reproducibility Limit (R)**—The difference between results obtained under reproducibility conditions that would, in the long run, in the normal and correct conduct of the test method, exceed the values in **Table 1** in only one case in twenty. When only a single test result is available, the Reproducibility Limit can be used to calculate a range (test result  $\pm$  Reproducibility Limit) outside of which a second test result would be expected to fall about one time in twenty.

**13.1.3** The test precision, as of Jan. 1, 2005, is shown in **Table 1**.

**13.2** Bias is unknown at this time, but will be determined as more data are collected.

## 14. Keywords

14.1 corrosion; diesel engine; lubricant

## ANNEXES

### (Mandatory Information)

#### A1. THE ROLE OF THE ASTM TEST MONITORING CENTER AND THE CALIBRATION PROGRAM

**A1.1 Nature and Functions of the ASTM Test Monitoring Center (TMC)**—The TMC<sup>2</sup> is a non-profit organization located in Pittsburgh, Pennsylvania (USA). The TMC is staffed to administer technical studies, conduct laboratory visits, perform statistical analyses of reference oil test data, blend, store and ship reference oils, and provide associated administrative functions to maintain the referencing calibration program for various lubricant tests as directed by Subcommittee D02.B0 and the Test Monitoring Board. The TMC coordinates its activities with the test sponsors, the test developers, the surveillance panels, and the testing laboratories through a consensus process.

**A1.2 Rules of Operation of the TMC**—The TMC operates in accordance with the ASTM Charter, the ASTM Bylaws, the Regulations Governing ASTM Technical Committees, the Bylaws Governing ASTM Committee D02, and the Rules and Regulations Governing the ASTM Test Monitoring System.

**A1.3 Management of the TMC**—The management of the Test Monitoring System is vested in the Test Monitoring Board (TMB) elected by Subcommittee D02.B0. The TMB selects the TMC Administrator who is responsible for directing the activities of the TMC staff.

**A1.4 Operating Income of the TMC**—The TMC's Operating income is obtained from fees levied on the reference oils supplied, and on the calibration tests conducted. Fee schedules are established and reviewed by Subcommittee D02.B0.

**A1.5 Conducting a Reference Oil Test**—For those laboratories choosing to utilize the services of the TMC in maintaining the calibration of test methods and apparatus, calibration testing is conducted at regular intervals as determined by the Diesel Lubricants Surveillance Panel. These tests are conducted using coded reference oils supplied by the TMC as outlined in **11.1** of this test method. It is the laboratories' responsibility to maintain the calibration in accordance with the test method. It is also the laboratories' responsibility to keep an on-site reference oil inventory at or above the minimum level specified by the TMC test representative.

**A1.6 New Laboratories**—Laboratories wishing to participate in the ASTM Test Monitoring System will be requested to conduct reference oil tests to ensure that the laboratory is using the proper testing techniques. Information concerning fees, laboratory inspections, reagents, testing practices, appropriate committee membership, and rater training can be obtained by contacting the TMC Administrator.<sup>2</sup>

**A1.7 Introducing New Reference Oils**—The calibrating reference oils produce various corrosion characteristics. When new reference oils are selected, member laboratories are requested to run their share of the tests needed to enable the TMC to recommend proper industry performance and precision targets and performance acceptance limits. These donated tests are run as required by the ASTM D02.B02 Corrosiveness of Diesel Lubricants Surveillance Panel to establish these targets and acceptance limits for new oils.

## A1.8 *TMC Information Letters:*

A1.8.1 Occasionally it may become necessary to change the test method, and notify the test laboratories of the change, prior to consideration of the change by either Subcommittee D02.B0 on Automotive Lubricants, or Committee D02 on Petroleum Products and Lubricants. In such a case, the TMC issues an Information Letter. Subsequently, prior to each semiannual Committee D02 meeting, the accumulated Information Letters are balloted by Subcommittee D02.B0. Following this action, the approved Information Letters are used to revise the affected standards, and these are balloted in the main committee, and finally, the Society. By this means, the Society due process procedures are applied to these Information Letters.

A1.8.2 The review of an Information Letter prior to its original issue differs according to its nature. In the case of an Information Letter concerning a part number change that does not affect test results, the TMC is authorized to issue such a letter. Long-term studies by the Surveillance Panel to improve test procedures through improved operation and hardware control might result in a recommendation to issue an Information Letter. If obvious procedural items affecting test results need immediate attention, the test sponsor and the TMC issue

an Information Letter and present the background and data to the Surveillance Panel for approval prior to the semiannual Subcommittee D02.B0 meeting.

A1.8.3 The ASTM Committee on Technical Committee Operations (COTCO) in 1984 gave authority for the issuance of Information Letters, as follows: “COTCO recognizes that D02 has a unique and complex situation. The use of Information Letters is approved providing each letter contains a disclaimer to the effect that such has not obtained ASTM consensus. These Information Letters should be moved to such consensus as rapidly as possible.”

A1.9 *TMC Memoranda*—In addition to the Information Letters discussed under **A1.8**, supplementary memoranda can be issued by the TMC. These memoranda are developed by the TMC, often under the guidance of the surveillance panel, and distributed to the Corrosiveness of Diesel Lubricants Surveillance Panel, and to participating laboratories. The memoranda convey such information as approval for test parts or materials, clarification of the test procedure, notes and suggestions of the collection and analysis of special data that the TMC might request, or for any other pertinent matters having no direct affect on test performance, results, precision and bias.

## A2. REPORT FORMAT AND DATA DICTIONARY

A2.1 The required report forms and data dictionary are available on the ASTM Test Monitoring Center web page at <http://www.astmtmc.cmu.edu/> or can be obtained in hardcopy format from the TMC.

Final Report Cover Sheets  
Summary of Test Results  
Comments  
Data Dictionary

## SUMMARY OF CHANGES

Subcommittee D02.B0 has identified the location of selected changes to this standard since the last issue (D6594 – 19) that may impact the use of this standard. (Approved Dec. 15, 2019.)

(1) Revised subsection **10.4**.

(2) Added subsections **10.4.1**, **10.5.1**, **12.3**, and **12.3.1**.

Subcommittee D02.B0 has identified the location of selected changes to this standard since the last issue (D6594 – 14) that may impact the use of this standard. (Approved July 1, 2019.)

(1) Revised subsection **7.2.1**.



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