Designation: D6417 – 15

Standard Test Method for Estimation of Engine Oil Volatility by Capillary Gas Chromatography[1]

This standard is issued under the fixed designation D6417; 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 an estimation of the amount of engine oil volatilized at 371 °C (700 °F).

1.1.1 This test method can also be used to estimate the amount of oil volatilized at any temperature between 126 °C and 371 °C, if so desired.

1.2 This test method is limited to samples having an initial boiling point (IBP) greater than 126 °C (259 °F) or the first calibration point and to samples containing lubricant base oils with end points less than 615 °C (1139 °F) or the last n-paraffins in the calibration mixture. By using some instruments and columns, it is possible to extend the useful range of the test method.

1.3 This test method uses the principles of simulated distillation methodology.

1.4 This test method may be applied to both lubricant oil base stocks and finished lubricants containing additive packages. These additive packages generally contain high molecular weight, nonvolatile components that do not elute from the chromatographic column under the test conditions. The calculation procedure used in this test method assumes that all of the sample elutes from the column and is detected with uniform response. This assumption is not true for samples with nonvolatile additives, and application of this test method under such conditions will yield results higher than expected. For this reason, results by this test method are reported as area percent of oil.

1.5 The values stated in SI units are to be regarded as standard. The values stated in inch-pound units are provided for information only.

1.6 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D2887 Test Method for Boiling Range Distribution of Petroleum Fractions by Gas Chromatography

D4626 Practice for Calculation of Gas Chromatographic Response Factors

D5800 Test Method for Evaporation Loss of Lubricating Oils by the Noack Method

D6352 Test Method for Boiling Range Distribution of Petroleum Distillates in Boiling Range from 174 °C to 700 °C by Gas Chromatography

E355 Practice for Gas Chromatography Terms and Relationships

E594 Practice for Testing Flame Ionization Detectors Used in Gas or Supercritical Fluid Chromatography

E1510 Practice for Installing Fused Silica Open Tubular Capillary Columns in Gas Chromatographs

2.2 *Coordinating European Council Standard:*

CEC L-40–93 Evaporation Loss of Lubricating Oils (NOACK Evaporative Tester)[3]

3. Terminology

3.1 *Definitions*—This test method makes reference to many common gas chromatographic procedures, terms, and relationships. Detailed definitions of these can be found in Practices E355, E594, and E1510.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *area slice*—the area resulting from the integration of the chromatographic detector signal within a specified retention time interval. In area slice mode (see 6.5.2), peak detection parameters are bypassed and the detector signal integral is recorded as area slices of consecutive, fixed duration time intervals.

[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 D02.04.0H on Chromatographic Distribution Methods.

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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] Available from Coordinating European Council (CEC), C/o Interlynk Administrative Services, Ltd., P.O. Box 6475, Earl Shilton, Leicester, LE9 9ZB, U.K., http://www.cectests.org.

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

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