



Designation: D 5399 – 95

Standard Test Method for Boiling Point Distribution of Hydrocarbon Solvents by Gas Chromatography¹

This standard is issued under the fixed designation D 5399; 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 boiling point distribution of hydrocarbon solvents by capillary gas chromatography. This test method is limited to samples having a minimum initial boiling point of 37°C (99°F), a maximum final boiling point of 285°C (545°F), and a boiling range of 5 to 150°C (9 to 270°F) as measured by this test method.

1.2 The values stated in SI units are standard. The values given in parentheses are for information purposes 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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 86 Test Method for Distillation of Petroleum Products²

D 850 Test Method for Distillation of Industrial Aromatic Hydrocarbons and Related Materials³

D 1078 Test Method for Distillation Range of Volatile Organic Liquids³

D 2887 Test Method for Boiling Range Distribution of Petroleum Fractions by Gas Chromatography⁴

D 2892 Test Method for Distillation of Crude Petroleum (15-Theoretical Plate Column)⁴

D 3710 Test Method for Boiling Range Distribution of Gasoline and Gasoline Fractions by Gas Chromatography⁴

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁵

3. Terminology

3.1 Definitions:

3.1.1 *initial boiling point (IBP)*—the point at which a cumulative area count equal to 0.5 % of the total area under the chromatogram is obtained.

3.1.2 *final boiling point (FBP)*—the point at which a cumulative area count equal to 99.5 % of the total area under the chromatogram is obtained.

4. Summary of Test Method

4.1 The sample is introduced into a capillary gas chromatographic column that separates hydrocarbons in the order of increasing boiling point. The column temperature is raised at a reproducible rate and the area under the chromatogram is recorded throughout the run. Boiling points are assigned from a calibration curve obtained under the same conditions by running a known mixture of hydrocarbons covering the boiling range expected in the sample. From these data, the boiling point distribution of the sample is obtained.

5. Significance and Use

5.1 The gas chromatographic determination of the boiling point distribution of hydrocarbon solvents can be used as an alternative to conventional distillation methods for control of solvents quality during manufacture, and specification testing.

5.2 Boiling point distribution data can be used to monitor the presence of product contaminants and compositional variation during the manufacture of hydrocarbon solvents.

5.3 Boiling point distribution data obtained by this test method are not equivalent to those obtained by Test Methods D 86, D 850, D 1078, D 2887, D 2892, and D 3710.

6. Apparatus

6.1 *Chromatograph*—Any gas chromatograph that can handle capillary column and has the following characteristics:

6.1.1 *Detector*—A flame ionization detector (FID) capable of continuous operation at a temperature equivalent to the maximum column temperature employed.

6.1.2 *Column Temperature Programmer*—The chromatograph must be capable of reproducible linear temperature programming over a range sufficient to establish a retention time of 1 min for *n*-pentane and to allow elution of entire sample within a reasonable time period.

6.1.3 *Sample Inlet System*—The sample inlet system must be capable of operating continuously at a temperature up to the maximum column temperature employed, or provide on-column injection.

NOTE 1—The use of cool, on-column injection using an automatic

¹ This test method is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.35 on Solvents, Plasticizers, and Chemical Intermediates.

Current edition approved Nov. 10, 1995. Published January 1996. Originally published as D 5399 – 93. Last previous edition D 5399 – 93.

² *Annual Book of ASTM Standards*, Vol 05.01.

³ *Annual Book of ASTM Standards*, Vol 06.04.

⁴ *Annual Book of ASTM Standards*, Vol 05.02.

⁵ *Annual Book of ASTM Standards*, Vol 14.02.