



Designation: D6377 – 20

Standard Test Method for Determination of Vapor Pressure of Crude Oil: VPCR_x (Expansion Method)¹

This standard is issued under the fixed designation D6377; 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 use of automated vapor pressure instruments to determine the vapor pressure exerted in vacuum of crude oils. This test method is suitable for testing samples that exert a vapor pressure between 25 kPa and 180 kPa at 37.8 °C at vapor-liquid ratios from 4:1 and 0.02:1 ($X = 4$ and 0.02).

NOTE 1—This test method is suitable for the determination of the vapor pressure of crude oils at temperatures from 0 °C to 100 °C and pressures up to 500 kPa, but the precision and bias statements (see Section 14) may not be applicable. The current precision of the method is limited at vapor-liquid ratios of 0.02 and 4. (Section 14 is inclusive of vapor-liquid ratios of 0.02 and 4).

1.2 This test method also allows the determination of vapor pressure for crude oil samples having pour points above 15 °C provided the proper sample handling, transfer, and analysis procedures are followed.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *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. For specific warning statements, see 7.2.1 – 7.3.2.*

1.5 *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.*

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 D02.08 on Volatility.

Current edition approved June 1, 2020. Published June 2020. Originally approved in 1999. Last previous edition approved in 2016 as D6377 – 16. DOI: 10.1520/D6377-20.

2. Referenced Documents

2.1 ASTM Standards:²

- D323 Test Method for Vapor Pressure of Petroleum Products (Reid Method)
- D2892 Test Method for Distillation of Crude Petroleum (15-Theoretical Plate Column)
- D3700 Practice for Obtaining LPG Samples Using a Floating Piston Cylinder
- D4057 Practice for Manual Sampling of Petroleum and Petroleum Products
- D4177 Practice for Automatic Sampling of Petroleum and Petroleum Products
- D5191 Test Method for Vapor Pressure of Petroleum Products and Liquid Fuels (Mini Method)
- D5842 Practice for Sampling and Handling of Fuels for Volatility Measurement
- D5853 Test Method for Pour Point of Crude Oils
- D6708 Practice for Statistical Assessment and Improvement of Expected Agreement Between Two Test Methods that Purport to Measure the Same Property of a Material
- D7975 Test Method for Determination of Vapor Pressure of Crude Oil: VPCR_x-F(T_m°C) (Manual Expansion Field Method)
- D8009 Practice for Manual Piston Cylinder Sampling for Volatile Crude Oils, Condensates, and Liquid Petroleum Products

3. Terminology

3.1 Definitions:

3.1.1 *platinum resistance thermometer*, n —temperature measuring device constructed with a length of platinum wire, whose electrical resistance changes in relation to temperature.

3.1.2 *vapor-liquid ratio (V/L)*, n —the ratio of the vapor volume to the liquid volume of specimen, in equilibrium, under specified conditions.

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.

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