



Standard Test Method for Determination of Vapor Pressure of Crude Oil: VPCR_x-F(Tm°C) (Manual Expansion Field Method)¹

This standard is issued under the fixed designation D7975; 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 manual vapor pressure instruments to determine the vapor pressure of crude oils exerted in a vacuum. 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 to 0.25:1 ($X = 4$ to 0.25, see 3.2.4).

NOTE 1—This test method is suitable for the determination of the vapor pressure of crude oils at temperatures from 0 °C to 60 °C and pressures up to 500 kPa, but the precision and bias statements (see Section 15) may not be applicable.

1.2 This test method is meant primarily for use under field conditions for immediate evaluation of vapor pressure for storage, transport, or operational uses.

1.3 This test method is not intended for use in custody transfer applications. Test Method D6377 shall be used for custody transfer applications.

1.4 This test method provides a reasonable confirmation for the presence of light ends in the source material given that the partial pressure of low boiling components contribute significantly to total vapor pressure.

1.5 This test method allows both sample collection and subsequent vapor pressure measurement of crude oil samples directly from the sample source. The collected sample may also be transferred to an automated vapor pressure instrument such as used for Test Method D6377. The field test apparatus is suitable for transportation provided suitable over-pack is used to meet the regulations for the transportation of dangerous goods in the transportation jurisdiction(s).

1.6 This test method allows the determination of vapor pressure for crude oil samples having pour points below 0 °C and flow at the sampling conditions to allow inlet to the apparatus.

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

1.7.1 *Exception*—Other units of measurement are included in this standard for ease of use in multiple jurisdictions.

1.8 *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

D323 Test Method for Vapor Pressure of Petroleum Products (Reid Method)

D1193 Specification for Reagent Water

D5191 Test Method for Vapor Pressure of Petroleum Products (Mini Method)

D5853 Test Method for Pour Point of Crude Oils

D6377 Test Method for Determination of Vapor Pressure of Crude Oil: VPCR_x (Expansion Method)

3. Terminology

3.1 *Definitions:*

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

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *dead crude oil, n*—a term usually employed for crude oils that, when exposed to normal atmospheric pressure at room temperature, will *not* result in actual boiling of the sample.

3.2.1.1 *Discussion*—These crudes will have vapor pressures below atmospheric pressure at room temperature.

3.2.1.2 *Discussion*—This method will provide vapor pressure information that will allow the user to determine if a crude oil is considered “dead” or “live.” A crude oil shall always be considered “live” until the vapor pressure can be established. Sampling and handling of dead crude oils can usually be done

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.

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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.