



Designation: D8253 – 20

Standard Test Method for Determination of the Asphaltene Solvency Properties of Bitumen, Crude Oil, Condensate and/or Related Products for the Purpose of Calculating Stability, Compatibility for Blending, Fouling, and Processibility (Manual Microscopy Method)¹

This standard is issued under the fixed designation D8253; 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 a basic microscope to determine the asphaltene solvency properties of bitumen, crude oil, condensate or related products, or the combinations thereof. These properties can be used to calculate the solubility parameters required to calculate and predict asphaltene stability for blending purposes, refinery unit fouling, processibility, emulsion stabilization, pipeline and tank deposition, and equipment fouling. If the solubility properties are known for two products, then the compatibility of potential blend ratios can be predicted.

1.2 This test method is limited to products that allow handling at atmospheric pressure and room temperature conditions without a significant loss of light end components. Loss of light ends will result in changes in the solubility properties of the product and may alter or bias the results, or both. Samples with vapor pressures (VPCR₄ at 37.8 °C using Test Method D6377) greater than 100 kPa are not suitable for use with this test method.

1.3 This test method is primarily suited to products that are freely flowing at test conditions. Samples that are too viscous to flow at test conditions, such as semi-solids, may need to be heated to allow handling (See Annex A1.)

1.4 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

1.5 *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.*

1.6 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D6560 Test Method for Determination of Asphaltenes (Heptane Insolubles) in Crude Petroleum and Petroleum Products

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

3. Terminology

3.1 *Definitions:*

3.1.1 *asphaltenes, n—(rarely used in the singular), in petroleum technology*, represent an oil fraction that is soluble in a specified aromatic solvent but separates upon the addition of an excess of a specified paraffinic solvent.

3.1.1.1 *Discussion*—Asphaltenes are found largely in crude oils and in heavy fuel oils containing residual fractions. They are insoluble in alkanes such as heptane and pentane, but soluble in aromatic solvents such as benzene or toluene.

3.1.2 *compatibility, n—of crude oils or heavy fuel oils*, the ability of two or more crude oils or fuel oils to blend together within certain concentration ranges without evidence of separation, such as the formation of multiple phases.

3.1.2.1 *Discussion*—Incompatible heavy fuel oils or crude oils, when mixed or blended, result in flocculation or precipitation of asphaltenes. Some oils may be compatible within

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 D02.14 on Stability, Cleanliness and Compatibility of Liquid Fuels.

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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.