Designation: D7042 – 16$^{\varepsilon 3}$

Standard Test Method for Dynamic Viscosity and Density of Liquids by Stabinger Viscometer (and the Calculation of Kinematic Viscosity)[1]

This standard is issued under the fixed designation D7042; 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.

ε[1] NOTE—The title of Table X3.2 was corrected editorially in July 2016.
ε[2] NOTE—Tables 2 and 3 were corrected editorially in September 2016.
ε[3] NOTE—Subsection 15.4.5 and footnote 12 were corrected editorially in December 2016.

1. Scope*

1.1 This test method covers and specifies a procedure for the concurrent measurement of both the dynamic viscosity, η, and the density, ρ, of liquid petroleum products and crude oils, both transparent and opaque. The kinematic viscosity, ν, can be obtained by dividing the dynamic viscosity, η, by the density, ρ, obtained at the same test temperature.

1.2 The result obtained from this test method is dependent upon the behavior of the sample and is intended for application to liquids for which primarily the shear stress and shear rate are proportional (Newtonian flow behavior).

1.3 The precision has only been determined for those materials, viscosity ranges, density ranges, and temperatures as indicated in Section 15 on Precision and Bias. The test method can be applied to a wider range of materials, viscosity, density, and temperature. For materials not listed in Section 15 on Precision and Bias, the precision and bias may not be applicable.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this 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 and health practices and to determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D396 Specification for Fuel Oils
D445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)
D975 Specification for Diesel Fuel Oils
D2162 Practice for Basic Calibration of Master Viscometers and Viscosity Oil Standards
D2270 Practice for Calculating Viscosity Index from Kinematic Viscosity at 40 °C and 100 °C
D4052 Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter
D6299 Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical Measurement System Performance
D6300 Practice for Determination of Precision and Bias Data for Use in Test Methods for Petroleum Products and Lubricants
D6617 Practice for Laboratory Bias Detection Using Single Test Result from Standard Material
D6708 Practice for Statistical Assessment and Improvement of Expected Agreement Between Two Test Methods that Purport to Measure the Same Property of a Material

[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 D02.07 on Flow Properties.

Current edition approved May 15, 2016. Published June 2016. Originally approved in 2004. Last previous edition approved in 2014 as D7042 – 14. DOI:10.1520/D7042-16E03.

[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**

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