
Draft Jamaican Standard

Method of Test

for

**Density, relative density, and API gravity of liquids by digital
density meter**



BUREAU OF STANDARDS JAMAICA

NON-OBJECTION PERIOD: 3 December 2023 to 1 January 2024

Draft Jamaican Standard

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DJS ASTM D4052: 2023

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Jamaican Standards establish requirements in relation to commodities, processes and practices, but not purport to include all the necessary provisions of a contract.

The attention of those using this standard method of test is called to the necessity of complying with any relevant legislation.

Amendments

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National Foreword

This standard is an adoption and is identical to ASTM D4052: 2022 Standard method of test for Density, relative density, and API gravity of liquids by digital density meter published by **American Society for Testing Materials (ASTM) International**.

Scope of the Standard

- 1.1 This test method covers the determination of the density, relative density, and API Gravity of petroleum distillates and viscous oils that can be handled in a normal fashion as liquids at the temperature of test, utilizing either manual or automated sample injection equipment. Its application is restricted to liquids with total vapor pressures (see Test Method [D5191](#)) typically below 100 kPa and viscosities (see Test Method [D445](#) or [D7042](#)) typically below about 15 000 mm²/s at the temperature of test. The total vapor pressure limitation however can be extended to >100 kPa provided that it is first ascertained that no bubbles form in the U-tube, which can affect the density determination. Some examples of products that may be tested by this procedure include: gasoline and gasoline-oxygenate blends, diesel, jet, basestocks, waxes, and lubricating oils.
- 1.1.1 Waxes and highly viscous samples were not included in the 1999 interlaboratory study (ILS) sample set that was used to determine the current precision statements of the method, since all samples evaluated at the time were analyzed at a test temperature of 15 °C. Wax and highly viscous samples require a temperature cell operated at elevated temperatures necessary to ensure a liquid test specimen is introduced for analysis. Consult instrument manufacturer instructions for appropriate guidance and precautions when attempting to analyze wax or highly viscous samples. Refer to the Precision and Bias section of the method and [Note 9](#) for more detailed information about the 1999 ILS that was conducted.
- 1.2 In cases of dispute, the referee method is the one where samples are introduced manually as in [6.2](#) or [6.3](#), as appropriate for sample type.
- 1.3 When testing opaque samples, and when not using equipment that is capable of automatic bubble detection, proper procedure shall be established so that the absence of air bubbles in the U-tube can be established with certainty. For the determination of density in crude oil samples use Test Method [D5002](#).
- 1.4 The values stated in SI units are regarded as the standard, unless stated otherwise. The accepted units of measure for density are grams per millilitre (g/mL) or kilograms per cubic metre (kg/m³).
- 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. For specific warning statements, see [3.2.1](#), Section [7](#), [9.1](#), [10.2](#), and [Appendix X1](#).
- 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.

Where the words 'International Standard' appear, referring to this standard, they should be read as 'Jamaican Standard'.

Where reference is made to informative and normative annexes the following definitions should be noted:

- Informative Annex – gives additional information intended to assist in the understanding or use of the document. They do not contain requirements.
- Normative Annex – gives provisions additional to those in the body of a document. They contain requirements.

Users should note that all standards undergo revision from time to time and that any reference made herein to any standard implies its latest edition, unless otherwise stated.

This standard is voluntary.

Acknowledgement

Acknowledgement is made to **American Society for Testing Materials (ASTM) International** for permission to adopt ASTM D4052: 2022.