Designation: D1152 – 24

Standard Specification for Methanol (Methyl Alcohol)[1]

This standard is issued under the fixed designation D1152; 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 specification covers methanol (99.85 % grade).

1.1.1 There are a wide range of different ways to produce methanol and a wide range of needs by methanol users. This specification is a general guide. A number of properties are included in 3.2. These are properties that may not be required by some users.

1.2 The following applies to all specified limits in this standard; for purposes of determining conformance with this standard, an observed value or a calculated value shall be rounded off "to the nearest unit" in the last right-hand digit used in expressing the specification limit, in accordance with the rounding-off method of Practice E29.

1.3 Consult current OSHA regulations, suppliers' Safety Data Sheets, and local regulations for all materials used in this specification.

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 Any person sampling or handling this product should have consulted a Safety Data Sheet (SDS) for specific first aid instructions and information on the proper equipment to have available for use in the event of personal contact or exposure.

1.6 *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.*

1.7 *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]

D1078 Test Method for Distillation Range of Volatile Organic Liquids

D1353 Test Method for Nonvolatile Matter in Volatile Solvents for Use in Paint, Varnish, Lacquer, and Related Products

D1363 Test Method for Permanganate Time of Acetone and Methanol

D1613 Test Method for Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer, and Related Products

D1722 Test Method for Water Miscibility of Water-Soluble Solvents

D4052 Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter

D4629 Test Method for Trace Nitrogen in Liquid Hydrocarbons by Syringe/Inlet Oxidative Combustion and Chemiluminescence Detection

D5386 Test Method for Color of Liquids Using Tristimulus Colorimetry

D6304 Test Method for Determination of Water in Petroleum Products, Lubricating Oils, and Additives by Coulometric Karl Fischer Titration

D7183 Test Method for Determination of Total Sulfur in Aromatic Hydrocarbons and Related Chemicals by Ultraviolet Fluorescence

D7184 Test Method for Ultra Low Nitrogen in Aromatic Hydrocarbons by Oxidative Combustion and Reduced Pressure Chemiluminescence Detection

D7359 Test Method for Total Fluorine, Chlorine and Sulfur in Aromatic Hydrocarbons and Their Mixtures by Oxidative Pyrohydrolytic Combustion followed by Ion Chromatography Detection (Combustion Ion Chromatography-CIC)

D7536 Test Method for Chlorine in Aromatics by Monochromatic Wavelength Dispersive X-ray Fluorescence Spectrometry

[1] This specification is under the jurisdiction of ASTM Committee D16 on Aromatic, Industrial, Specialty and Related Chemicals and is the direct responsibility of Subcommittee D16.14 on Alcohols & Glycols.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. 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**

D8005 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)
E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
E203 Test Method for Water Using Volumetric Karl Fischer Titration
E300 Practice for Sampling Industrial Chemicals
E346 Test Method for Analysis of Carbonizables in Methanol
E394 Test Method for Iron in Trace Quantities Using the 1,10-Phenanthroline Method
E1064 Test Method for Water in Organic Liquids by Coulometric Karl Fischer Titration
E1615 Test Method for Determination of Trace Quantities of Iron by Visible Spectrophotometry
E2680 Test Method for Appearance of Clear, Transparent Liquids (Visual Inspection Procedure)

2.2 *U.S. Fed. Specification:*
PPP-C-2020 Federal Specification Packaging of Chemicals, Liquid, Dry, and Paste[3]

[3] Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098.

2.3 *(IMPCA) Specification:*
IMPCA 001 IMPCA Methanol Reference Specification

3. Properties

3.1 Methanol (99.85 % grade) shall conform to this specification (see Table 1).

3.2 The following supplementary requirements shall apply only when agreed to by the seller and purchaser in the purchase order or contract (see Table 2).

4. Sampling

4.1 Sample the material in accordance with Practice E300.

5. Packaging and Package Marking

5.1 Package size shall be agreed upon between the purchaser and the supplier.

5.2 Packaging shall conform to applicable carrier rules and regulations or when specified shall conform to U.S. Fed. Spec. PPP-C-2020.

6. Keywords

6.1 methanol; methyl alcohol

TABLE 1 Required Specifications of Methanol

Property	Specification	ASTM International Standard[A]
Methanol on a dry basis, min, weight %	99.85	IMPCA 001
Acetone, max, mg/kg	30	IMPCA 001
Ethanol, max, mg/kg	50	IMPCA 001
Water, max, weight %	0.100	D6304 or E203 or E1064
Acidity as Acetic Acid, max, mg/kg	30	D1613
Carbonizables, max, Pt-Co	30	E346
Potassium permanganate time test at 15 °C, min, minutes	60	D1363
Water miscibility	Pass test	D1722
Appearance	Bright and clear	E2680
Color, max, Pt-Co	5	D5386 or D8005
Specific Gravity 20 °C /20 °C	0.7910 to 0.7930	D4052

[A] If more than one method is listed, the producer and user should agree on the referee method.

TABLE 2 Optional Specifications of Methanol

Property	Specification	ASTM International Standard[A]
Aromatics, max, mg/kg	1.0	IMPCA 001
Total chlorine, max, mg/kg	0.5	D7359 or D7536
Iron in solution, max, mg/kg	0.1	E394 or E1615
Total nitrogen, max, mg/kg	1.0	D4629 or D7184
Sulfur, max, mg/kg	0.5	D7183 or D7359
Distillation range at 760 mm Hg, max, °C	1.0	D1078
Nonvolatile matter, max, mg/1000 mL	10	D1353

[A] If more than one method is listed, the producer and user should agree on the referee method.

SUMMARY OF CHANGES

Committee D01.35 has identified the location of selected changes to this standard since the last issue (D1152 – 06 (2012)) that may impact the use of this standard. (Approved May 1, 2024.)

(1) Set mandatory and optional properties, see Table 1 and Table 2.
(2) Removed "odor" and moved "distillation range, nonvolatile matter" to optional properties, in 3.1 and 3.2.
(3) Changed the specifications of "specific gravity, color, carbonizables, and permanganate time, mid boiling point of distillation range and nonvolatile matter" in 3.1.
(4) Added properties of "methanol, ethanol and water miscibility" as mandatory properties in 3.1.
(5) Added "aromatics, total chlorine, iron, total nitrogen and sulfur," as optional properties in 3.2.
(6) Added and updated test methods in Section 2.