Designation: D1153 – 12

Standard Specification for Methyl Isobutyl Ketone[1,2]

This standard is issued under the fixed designation D1153; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This specification covers methyl isobutyl ketone (99.0 % grade).

1.2 For specific hazard information and guidance, see the supplier's Material Safety Data Sheet for materials listed in this specification.

1.3 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.

1.4 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 determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[3]

D268 Guide for Sampling and Testing Volatile Solvents and Chemical Intermediates for Use in Paint and Related Coatings and Material

D1078 Test Method for Distillation Range of Volatile Organic Liquids

D1209 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)

D1296 Test Method for Odor of Volatile Solvents and Diluents

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

D1364 Test Method for Water in Volatile Solvents (Karl Fischer Reagent Titration Method)

D1476 Test Method for Heptane Miscibility of Lacquer Solvents

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

D3329 Test Method for Purity of Methyl Isobutyl Ketone by Gas Chromatography

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

D5386 Test Method for Color of Liquids Using Tristimulus Colorimetry

E1 Specification for ASTM Liquid-in-Glass Thermometers

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

E300 Practice for Sampling Industrial Chemicals

2.2 *U.S. Federal Specification:*

PPP-C-2020 Chemicals, Liquid, Dry, and Paste: Packaging of [4]

3. Properties

3.1 Methyl isobutyl ketone (99.0 % grade) shall conform to the following requirements:

[1] This specification is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.35 on Solvents, Plasticizers, and Chemical Intermediates.

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[2] This compound is also known under the name of 2-methyl -4-pentanone.

[3] 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.

[4] Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, http://dodssp.daps.dla.mil.

***A Summary of Changes section appears at the end of this standard**

Methyl isobutyl ketone wt %, min	99.0
Apparent specific gravity:	
20/20°C	0.800 to 0.803
or	
25/25°C	0.796 to 0.799
Color, Pt-Co units, max[A]	15
Distillation, °C	
Initial boiling point, min	114.0
Dry point, max	117.0
Nonvolatile matter, mg/100 mL, max	5
Odor[B]	nonresidual
Water, wt %, max[C]	0.1
Acidity (free acid as acetic acid), wt % , max	0.01
Methyl isobutyl carbinol, wt %, max	0.3

[A] Instrumental Pt-Co color determined by Test Method D5386 have been shown to have no statistically significant difference from PT-Co color determined by Test Method D1209. However, it is not known whether methyl isobutyl ketone was part of the sample set included in the interlaboratory study.
[B] Optional: Test for odor only when agreed upon as necessary by the purchaser and the supplier.
[C] This quantitative water limit ensures that the material is miscible without turbidity with 19 volumes of 99 % heptane at 20°C.

4. Sampling

4.1 The material shall be sampled in accordance with Practice E300.

5. Test Methods

5.1 The properties enumerated in this application shall be determined in accordance with the following ASTM Test Methods:

5.1.1 *Apparent Specific Gravity*—Determine the apparent specific gravity by any convenient method that is accurate to the third decimal place, the temperature of both specimen and water being 20 or 25°C. See Guide D268 or Test Method D4052.

5.1.2 *Color*—Test Method D1209.

5.1.3 *Distillation Range*—Test Method D1078 using an ASTM Solvents Distillation Thermometer having a range from 98 to 152°C and conforming to the requirements for Thermometer 41C as prescribed in Specification E1. Thermometric devices such as RTDs, thermistors and liquid-in-glass thermometers of equal or better accuracy in the specified temperature range, may be used.

5.1.4 *Nonvolatile Matter*—Test Method D1353.

5.1.5 *Odor*—Test Method D1296.

5.1.6 *Water*—Test Method D1364 or D1476.

5.1.7 *Acidity*—Test Method D1613.

5.1.8 *Alcohol and Purity*—Test Method D3329.

6. Packaging and Package Marking

6.1 Package site shall be agreed upon by the purchaser and the supplier.

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

7. Keywords

7.1 ketones; methyl isobutyl ketone (MIBK); solvents; 2-methyl-4-pentanone

SUMMARY OF CHANGES

Committee D01.35 has identified the location of selected changes to this standard since the last issue (D1153 - 06) that may impact the use of this standard. (Approved November 1, 2012.)

(1) Added language in 5.1.3 that allows for the use of non-mercury thermometers.