Designation: D740 – 11

Standard Specification for Methyl Ethyl Ketone[1,2]

This standard is issued under the fixed designation D740; 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 two types of methyl ethyl ketone that are used primarily as solvents in lacquers and industrial coatings, but also in adhesives, printing inks, lube oil dewaxing, and as chemical intermediates.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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

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)

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)

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

D2804 Test Method for Purity of Methyl Ethyl 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

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. Classification

3.1 Methyl ethyl ketone shall be of the following types, as specified:

3.1.1 *Type I*—regular, and

3.1.2 *Type II*—urethane grade. This type may be suited for use in urethane coatings, provided that the water content and alcohol content are acceptable.

4. Properties

4.1 The physical and chemical properties of methyl ethyl ketone shall conform to the requirements specified in Table 1.

5. Sampling

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

6. Test Methods

6.1 The properties enumerated in this specification shall be determined in accordance with the following ASTM test methods:

6.1.1 *Acidity*—Test Method D1613.

[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] Also known as butanone and 2–butanone.

[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**

TABLE 1 Physical and Chemical Properties of Methyl Ethyl Ketone

	Type I	Type II
Commercial reference	regular	urethane-grade
Acidity[A], weight %, max	0.005	0.003
Alcohol[B], weight %, max	...	0.5
Color, Pt-Co scale, max[C]	10	10
Distillation range, 760 mm Hg,°C		
Initial boiling point, min	78.5	78.5
Dry point, max	81.0	81.0
Nonvolatile matter, mg/100 mL, max	5	5
Purity, weight %, min	99.5	99.5
Specific gravity, apparent		
20/20°C	0.805 to 0.807	0.805 to 0.807
or		
25/25°C	0.801 to 0.803	0.801 to 0.803
Water, weight %, max	0.2	0.05

[A] Free acid as acetic acid. Equivalent to 0.047 mg potassium hydroxide (KOH) per gram of material.
[B] Calculated as 2-butanol or sec-butyl alcohol.
[C] 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 ethyl ketone was part of the sample set included in the laboratory study.

6.1.2 *Alcohol*—Test Method D2804.

6.1.3 *Color*—Test Method D1209 (see Footnote C in Table 1).

6.1.4 *Distillation Range*—Test Method D1078, using a temperature measuring device having a range of 48 to 102°C and a resolution of 0.1°C.

6.1.5 *Nonvolatile Matter*—Test Method D1353.

6.1.6 *Purity*—Test Method D2804.

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

6.1.8 *Water*—Test Method D1364.

7. Packaging and Package Marking

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

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

8. Keywords

8.1 methyl ethyl ketone; regular grade; solvents; urethane grade; 2–butanone

SUMMARY OF CHANGES

Committee D01 has identified the location of selected changes to this standard since the last issue (D740 - 05) that may impact the use of this standard. (Approved November 1, 2011.)

(1) Revised 6.1.4.

(2) Removed Specification E1 from 2.1.