



Designation: D 740 – 94 (Reapproved 1997)

AMERICAN SOCIETY FOR TESTING AND MATERIALS
100 Barr Harbor Dr., West Conshohocken, PA 19428
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Standard Specification for Methyl Ethyl Ketone^{1,2}

This standard is issued under the fixed designation D 740; 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 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:

D 268 Guide for Sampling and Testing Volatile Solvents and Chemical Intermediates for Use in Paint and Related Coatings and Materials³

D 1078 Test Method for Distillation Range of Volatile Organic Liquids³

D 1209 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)³

D 1353 Test Method for Nonvolatile Matter in Volatile Solvents for Use in Paint, Varnish, Lacquer, and Related Products³

D 1364 Test Method for Water in Volatile Solvents (Fischer Reagent Titration Method)³

D 1613 Test Method for Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer and Related Products³

D 2804 Test Method for Purity of Methyl Ethyl Ketone Using Gas Chromatography³

D 4052 Test Method for Density and Relative Density of Liquids by Digital Density Meter⁴

E 1 Specification for ASTM Thermometers⁵

E 300 Practice for Sampling Industrial Chemicals⁶

2.2 U.S. Federal Specification:

PPP-C-2020 Chemicals, Liquid, Dry, and Paste: Packaging of⁷

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 E 300.

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 D 1613.

6.1.2 *Alcohol*—Test Method D 2804.

6.1.3 *Color*—Test Method D 1209.

6.1.4 *Distillation Range*—Test Method D 1078, using an ASTM Solvents Distillation Thermometer 39C having a range from 48 to 102°C and conforming to the requirements in Specifications E 1.

6.1.5 *Nonvolatile Matter*—Test Method D 1353.

6.1.6 *Purity*—Test Method D 2804.

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 D 268, or Test Method D 4052.)

6.1.8 *Water*—Test Method D 1364.

7. Packaging and Package Marking

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

⁷ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094.

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

Current edition approved March 15, 1994. Published May 1994. Originally published as D 740 – 43. Last previous edition D 740 – 89.

² Also known as butanone and 2-butanone.

³ *Annual Book of ASTM Standards*, Vol 06.04.

⁴ *Annual Book of ASTM Standards*, Vol 05.02.

⁵ *Annual Book of ASTM Standards*, Vol 14.03.

⁶ *Annual Book of ASTM Standards*, Vol 15.05.

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	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
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.

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

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8. Keywords

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