



Designation: D304 – 11 (Reapproved 2019)

Standard Specification for *n*-Butyl Alcohol (Butanol)¹

This standard is issued under the fixed designation D304; 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 U.S. Department of Defense.

1. Scope

1.1 This specification covers *n*-butyl alcohol (butanol).

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 hazard information and guidance, see the supplier’s Material Safety Data Sheets.

1.5 *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

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

D891 Test Methods for Specific Gravity, Apparent, of Liquid Industrial Chemicals

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)

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

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:*³

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

3. Properties

3.1 *n*-butyl alcohol (butanol) shall conform to the following requirements:

Apparent specific gravity:	
20/20 °C	0.810 to 0.813
or	
25/25 °C	0.807 to 0.810
Color, Pt-Co scale, max ^A	10
Distillation range, 760 mmHg	^B
Nonvolatile matter, max, mg/100 mL	5
Water, max, weight %	0.1 ^C
Acidity, as acetic acid, max, weight %	0.005 ^D

^A Instrumental Pt-Co color determined by Test Method D5386 has been shown to have no statistically significant difference from Pt-Co color determined by Test Method D1209. However, it is not known whether *n*-butyl alcohol was part of the sample set included in the interlaboratory study.

^B Shall distill entirely within a 1.5 °C range which shall include 117.7 °C.

^C This quantitative water limit ensures that the material is miscible without turbidity with 19 volumes of 99 % heptane at 20 °C.

³ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://www.dodssp.daps.mil>.

¹ This specification is under the jurisdiction of the 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 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.

^D Equivalent to 0.047 mg of KOH per gram of sample.

4. Sampling

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

5. Test Methods

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

5.1.1 *Apparent Specific Gravity*—Determine the apparent specific gravity at 20 or 25 °C by a convenient method that is accurate to the third decimal place. See Guide **D268** or Test Methods **D891** or **D4052**.

5.1.2 *Color*—Test Method **D1209** (see Note A in **3.1**).

5.1.3 *Distillation Range*—Test Method **D1078** using a temperature measuring device having a range of 72 to 126 °C and a resolution of 0.1 °C.

5.1.4 *Nonvolatile Matter*—Test Method **D1353**.

5.1.5 *Water*—Test Methods **D1364** and **D1476**.

5.1.6 *Acidity*—Test Method **D1613**.

6. Packaging and Package Marking

6.1 Package size shall be agreed upon between 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 *n*-butanol; *n*-butyl alcohol; 1-butanol; propyl carbinol

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