



Designation: D4615 – 22

## Standard Specification for *n*-Butyl Acetate (All Grades)<sup>1</sup>

This standard is issued under the fixed designation D4615; 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 ( $\epsilon$ ) 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 the various grades of *n*-butyl acetate suitable for use as solvents in paint and related coatings.

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

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

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *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:<sup>2</sup>

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)

D1296 Test Method for Odor of Volatile Solvents and Diluents (Withdrawn 2021)<sup>3</sup>

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

D3545 Test Method for Alcohol Content and Purity of Acetate Esters by Gas Chromatography (Withdrawn 2021)<sup>3</sup>

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:<sup>4</sup>

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

### 3. Properties

3.1 *n*-Butyl acetate shall conform to one of the requirements of one of the grades in Table 1.

<sup>1</sup> 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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<sup>2</sup> 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.

<sup>3</sup> The last approved version of this historical standard is referenced on www.astm.org.

<sup>4</sup> Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098.

**TABLE 1 Requirements for *n*-Butyl Acetate**

| Property                                | Grades       |              |              |                    |
|---|--------------|--------------|--------------|--------------------|
|   | 90–92        | 98           | 99.5         | 99.5U <sup>A</sup> |
| Purity, wt %, min                       | 90–92        | 98.0         | 99.5         | 99.5               |
| Alcohol, wt %, max                      | ...          | ...          | 0.5          | 0.5                |
| Color, Pt-Co units, max <sup>B</sup>    | 10           | 10           | 10           | 10                 |
| Distillation Range, °C                  | 118–128      | 120–128      | 124–129      | 124–129            |
| Nonvolatile Matter, mg/100 mL, max      | 5            | 5            | 5            | 5                  |
| Odor <sup>C</sup>                       | Non-residual | Non-residual | Non-residual | Non-residual       |
| Water, wt %, max                        | 0.2          | 0.1          | 0.1          | 0.05 <sup>D</sup>  |
| Acidity, wt %, max                      | 0.01         | 0.01         | 0.01         | 0.01               |
| Apparent Specific Gravity: <sup>E</sup> |              |              |              |                    |
| 20/20 °C                                | 0.874–0.876  | 0.880–0.883  | 0.880–0.883  | 0.880–0.883        |
| or                                      |              |              |              |                    |
| 25/25 °C                                | 0.870–0.872  | 0.876–0.879  | 0.876–0.879  | 0.876–0.879        |

<sup>A</sup> Urethane grade material.

<sup>B</sup> 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 *n*-butyl acetate was part of the sample set included in the interlaboratory study.

<sup>C</sup> Test for odor is optional and should be agreed upon between the buyer and the seller.

<sup>D</sup> Test method used to determine this value should be agreed upon between the buyer and the seller.

<sup>E</sup> Apparent specific gravity should be determined either at 20 °C or 25 °C, and not both. Results obtained at one temperature are valid. Test result at another temperature is redundant.

## 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 *Purity and Alcohol Content*—Test Method **D3545**.

5.1.2 *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 Methods **D891** or **D4052**.)

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 ther-

mometers of equal or better accuracy in the specified temperature range, may be used.

5.1.4 *Acidity*—Test Method **D1613**.

5.1.5 *Water*—Test Method **D1364**.

5.1.6 *Color*—Test Method **D1209**.

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

5.1.8 *Odor*—Test Method **D1296**.

## 6. Packaging and Package Marking

6.1 Package size to be agreed upon between the purchaser and 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 butyl acetate; ester; solvent

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