



Designation: D 4416 – 04

Standard Specification for Acrylic Acid¹

This standard is issued under the fixed designation D 4416; 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.

1. Scope*

1.1 This specification covers glacial acrylic acid² (99.0 % grade) for use in paint, varnish, lacquer and related products.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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 E 29.

1.4 *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.* For specific hazard statements, see Section 6.

1.5 For hazard information and guidance, see the supplier’s Material Safety Data Sheet.

2. Referenced Documents

2.1 *ASTM Standards:*³

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

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

D 3125 Test Method for Monomethyl Ether of Hydroquinone in Colorless Monomeric Acrylate Esters and Acrylic Acid

D 4415 Test Methods for Determination of Dimer in Acrylic Acid

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

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 as propenoic acid and vinyl formic acid.

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.

E 300 Practice for Sampling Industrial Chemicals

E 301 Test Method for Total Acidity of Organic Acids⁴

2.2 *U.S. Federal Specification:*

PPP-C-2020 Chemicals, Liquid, Dry, and Paste: Packaging of⁵

3. Properties

3.1 Glacial acrylic acid shall conform to the following requirements:

Acrylic acid, weight %, min	99.0
Water, weight %, max	0.20
Color, Pt-Co scale, max	20
Inhibitor, monomethyl ether of hydroquinone, ppm ^A	200 ± 20
Appearance	clear, transparent, with no sediment
Dimer, as shipped, weight %, max	1.0

^A Or as agreed upon between the buyer and the seller. Content below 180 ppm is not recommended as a safety precaution.

4. Sampling

4.1 Sample the material in accordance with Practice E 300. Use brown glass sample bottles and protect samples from light and heat at all times.

5. Test Methods

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

5.1.1 *Purity*—Test Method E 301.

5.1.2 *Water*—Test Method D 1364.

5.1.3 *Color*—Test Method D 1209.

5.1.4 *Inhibitor*—Test Method D 3125.

5.1.5 *Dimer*—Test Methods D 4415.

6. Hazards

6.1 Avoid contamination that may cause violent reactions and dangerous pressures. Acrylic acid freezes at 12.3°C. Store between 15 and 25°C. If material freezes, exercise extreme caution in thawing, because rapid and violent polymerization may occur if frozen acrylic acid is exposed to excessive localized heat.

⁴ Withdrawn.

⁵ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098.

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