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**Designation: D 4709 – 93 (Reapproved 1999)**



Designation: D 4709 – 02

## Standard Specification for Methyl Acrylate<sup>1</sup>

This standard is issued under the fixed designation D 4709; 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.

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D-1 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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### 1. Scope\*

1.1 This specification covers methyl acrylate (99 % grade) for use in paint, varnish, lacquer, and related products.

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 E 29.

1.3 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 information see Section 4.

1.34 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 1209 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)<sup>2</sup>

D 1364 Test Method for Water in Volatile Solvents (Karl Fischer Reagent Titration Method)<sup>2</sup>

D 1613 Test Method for Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer, and Related Products<sup>2</sup>

D 3125 Test Method for Monomethyl Ether of Hydroquinone in Colorless Monomeric Acrylate Esters and Acrylic Acid<sup>2</sup>

D 3362 Test Method for Purity of Acrylate Esters by Gas Chromatography<sup>2</sup>

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications<sup>3</sup>

E 300 Practice for Sampling Industrial Chemicals<sup>4</sup>

#### 2.2 U.S. Federal Specification:

PPP-C-2020 Chemicals, Liquid, Dry, and Paste: Packaging of<sup>5</sup>

### 3. Properties

3.1 Methyl acrylate shall conform to the following requirements:

Purity, wt %, min, as methyl acrylate	99.5
Water, wt %, min	0.10
Color, Pt-Co units, max	
in bulk shipments	10
in drum shipments	20
Acidity, (free acid acrylic acid), wt %, max	-0.02
Acidity, (free acid acrylic acid), wt %, max	0.01
Methyl ether of hydroquinone	as agreed upon by the purchaser and the manufacturer

### 4. Hazards

4.1 Methyl acrylate is a flammable liquid. Its vapors can form explosive mixtures with air and are particularly irritating. Store samples in amber bottles or protect from light by other means to aid in preventing polymerization. Keep samples away from heat

<sup>2</sup> Annual Book of ASTM Standards, Vol 06.04.

<sup>3</sup> Annual Book of ASTM Standards, Vol 15.05: 14.02.

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

<sup>5</sup> Discontinued; see 2001 Annual Book of ASTM Standards, Vol 15.05.

<sup>6</sup> Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098

sources and chemicals that can cause free radical polymerization. Methyl acrylate can polymerize violently evolving considerable heat. The inhibitor, methyl ether of hydroquinone, requires oxygen to be active.

## 5. Sampling

5.1 The material shall be sampled in accordance with Practice E 300 (see Section 4 on Hazards).

## 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 *Purity*—Test Method D 3362.

6.1.2 *Water*—Test Method D 1364.

6.1.3 *Color*—Test Method D 1209.

6.1.4 *Acidity*—Determine the acidity in accordance with Test Method D 1613, except multiply the results obtained “as acetic acid” by 76.06/60.05 or 1.2. This will convert the results obtained to “as acrylic acid.” The results obtained “as mg KOH per g of sample” are unaffected.

6.1.5 *Methyl Ether of Hydroquinone Content*—Test Method D 3125.

## 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 acidity, alkalinity, or pH; color; methyl acrylate; purity

### SUMMARY OF CHANGES

Committee D01.35 has identified the location of selected changes to this standard since the last issue (D 4709 - 93 (1999)) that may impact the use of this standard.

(1) Added reference to Practice E 29 in Scope section.

(2) Added Practice E 29 to list of Referenced Documents.

(3) Changed limits for acidity from 0.02 to 0.01 in section 3.1.

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