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# Standard Specification for Allyl Molding Compounds[1]

This standard is issued under the fixed designation D1636; 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 compression molding, thermosetting, allyl compounds as further defined in Section 3.

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

NOTE 1—The properties included in this specification are those required to identify the molding compounds covered. There may be other requirements necessary to identify particular characteristics. These will be added to the specification as their inclusion becomes generally desirable and the necessary test data and methods become available.

NOTE 2—There is no ~~similar or equivalent ISO~~ known ISO equivalent to this standard.

## 2. Referenced Documents

2.1 *ASTM Standards:*[2]

D150 Test Methods for AC Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulation
D229 Test Methods for Rigid Sheet and Plate Materials Used for Electrical Insulation
D256 Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
D257 Test Methods for DC Resistance or Conductance of Insulating Materials
D618 Practice for Conditioning Plastics for Testing
D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
D2863 Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index)
D3892 Practice for Packaging/Packing of Plastics
D5224 Practice for Compression Molding Test Specimens of Thermosetting Molding Compounds



## 3. Classification

3.1 This specification provides for the identification of three types of allyl molding compounds, based on the general type of filler employed in their manufacture, which shall be distinguished by the requirements prescribed in Table 1.

*Type I*—High-strength materials, glass-fiber reinforced.
*Type II*—General-purpose mineral filled.
*Type III*—General-purpose synthetic fiber filler.

3.2 Types I and II may be subdivided into four classes according to resin composition and use as follows:

*Class A*—Diallyl ortho-phthalate resin, nonflame-retardant.
*Class B*—Diallyl ortho-phthalate resin, flame-retardant.
*Class C*—Diallyl meta-phthalate resin nonflame-retardant.
*Class D*—Diallyl meta-phthalate resin, flame-retardant.

3.3 The four classes of Type I are subdivided as follows: Classes A, B, C, and D into four grades. For Type II each of the four classes is subdivided into two grades. For Type III only Class A compounds are produced and are available in three grades.

## 4. General Requirements

4.1 The molding compound shall be of uniform composition and so compounded as to conform to the requirements of this specification.

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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.

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

**TABLE 1 Types, Classes, and Grades of Allyl Molding Compounds**

| Type | Class | Grade | Description |
|---|---|---|---|
| I | A, B, C, D | 1 | Long-glass fiber reinforcement |
| | | 2 | Medium-glass fiber reinforcement |
| | | 3 | Short-glass fiber reinforcement |
| II | A, B, C, D | 4 | High-impact, long-glass fiber reinforcement |
| III | A | 1 | Mineral-filled |
| | | 2 | Mineral and organic fiber-filled |
| | | 1 | Acrylic fiber reinforcement, short fiber |
| | | 2 | Polyester fiber reinforcement, long fiber |
| | | 3 | Polyester fiber reinforcement, milled fiber |

4.2 Although other than allyl resin may be added for flame resistance and other purposes, the major part of the resin portion shall be diallyl ortho-phthalate or diallyl meta-phthalate.

4.3 The apparent density, bulk factor, particle size, physical form, and color of the compounds shall be as agreed upon between the purchaser and supplier.

## 5. Detail Requirements

5.1 Average results obtained on test specimens, each compression-molded using the manufacturer's recommended techniques, shall conform to the requirements listed in Table 2.

## 6. Sampling

6.1 Adequate statistical sampling shall be used.

6.2 A batch of molding compound shall be considered a unit of manufacture and may consist of a blend of two or more production runs of the same material.

NOTE 3—Some molding compounds are light and fluffy. The resin may have a tendency to separate out to a degree and should be thoroughly mixed before sampling.



## 7. Specimen Preparation

7.1 Test specimens shall be compression molded in accordance with Practice D5224.



## 8. Conditioning

8.1 *Conditioning*—Molded test specimens of allyl molding compounds shall be conditioned in accordance with Procedure B of Practice D618, unless otherwise specified in the test methods or in this specification.

8.2 Tests shall be conducted in the standard laboratory atmosphere of 23 ± 2°C and 50 ± ~~5 %~~10 % relative humidity, unless otherwise specified in the test methods or in this specification.

**TABLE 2 Detail Requirements for Compression-Molded Specimens**

| Property | Class | Type I | | | | Type II | | Type III | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Grade 1 | Grade 2 | Grade 3 | Grade 4 | Grade 1 | Grade 2 | Grade 1[A] | Grade 2[A] | Grade 3[A] |
| Permittivity, max, 1 kHz/1 MHz | A, B, C, D | 4.6/4.6 | 4.6/4.4 | 4.6/4.5 | 4.6/4.6 | 7.0/6.0 | 8.2/6.0 | 4.1/3.8 | 4.1/3.8 | 4.1/3.8 |
| After immersion, max, 1 kHz/1 MHz | A, B, C, D | 4.7/4.7 | 4.7/4.5 | 4.6/4.5 | 4.7/4.7 | 8.0/7.0 | 9.5/6.0 | 4.2/3.9 | 4.2/3.9 | 4.2/3.9 |
| Dissipation factor, max 1 kHz/1 MHz | A, B, C, D | 0.010/0.018 | 0.009/0.015 | 0.009/0.015 | 0.010/0.018 | 0.14/0.12 | 0.14/0.12 | 0.025/0.020 | 0.016/0.020 | 0.016/0.020 |
| After immersion, max, 1 kHz/1 MHz | A, B, C, D | 0.012/0.019 | 0.013/0.017 | 0.013/0.017 | 0.012/0.019 | 0.20/0.14 | 0.20/0.14 | 0.028/0.023 | 0.018/0.023 | 0.018/0.023 |
| Impact resistance (Izod), min, J/m of notch | A, B, C, D | 147 | 16 | 16 | 320 | 15 | 15 | 32 | 147 | 147 |
| Flexural strength, min, MPa | A, B, C, D | 69.0 | 62.1 | 62.1 | 69.0 | 46.8 | 46.8 | 55.2 | 69.0 | 69.0 |
| Flame resistance:[B] | | | | | | | | | | |
| Ignition time, min, s | B, D | 90 | 90 | 90 | 90 | 90 | ... | ... | ... | ... |
| Burning time, max, s | | 90 | 90 | 90 | 90 | 90 | ... | ... | ... | ... |
| Insulation resistance, min,Ω | A | $1 \times 10^{10}$ | $1 \times 10^{11}$ | $1 \times 10^{11}$ | $1 \times 10^{10}$ | $1 \times 10^{10B}$ | $1 \times 10^{11B}$ | $1 \times 10^{11}$ | $1 \times 10^{11}$ | $1 \times 10^{11}$ |
| | B | $1 \times 10^{10}$ | $1 \times 10^{10}$ | $1 \times 10^{10}$ | $1 \times 10^{10}$ | $1 \times 10^{10B}$ | $1 \times 10^{11B}$ | ... | ... | ... |
| | C | $1 \times 10^{9}$ | $1 \times 10^{9}$ | $1 \times 10^{9}$ | $1 \times 10^{9}$ | $1 \times 10^{10B}$ | $1 \times 10^{11B}$ | ... | ... | ... |
| Oxygen index, min, % | D | $1 \times 10^{9}$ | $1 \times 10^{9}$ | $1 \times 10^{9}$ | $1 \times 10^{9}$ | $1 \times 10^{10B}$ | $1 \times 10^{11B}$ | ... | ... | ... |
| | B, D | 26 | ... | 26 | ... | 26 | ... | ... | ... | ... |

[A] Only Class A compounds are covered.
[B] Values are tentative until further testing is complete.