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Standard Specification for Thermosetting Polyester Molding Compounds[1]

This standard is issued under the fixed designation D1201; 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.

ε[1] NOTE—Reapproved with editorial changes in January 2022.

1. Scope*

1.1 This specification covers compression molding, thermosetting, unsaturated polyester molding compounds as further defined in 3.1.

1.2 The values stated in SI units are to be regarded as the standard.

NOTE 1—The properties included in this specification are those required to identify the types of 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—ISO 3672–1: 1979(E) is similar but not equivalent to this specification. Product classification and characterization are not equivalent.

1.3 *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]

D256 Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics

D495 Test Method for High-Voltage, Low-Current, Dry Arc Resistance of Solid Electrical Insulation

D570 Test Method for Water Absorption of Plastics

D618 Practice for Conditioning Plastics for Testing

D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

D792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement

D3892 Practice for Packaging/Packing of Plastics

2.2 *ISO Standard:*

ISO 3672–1: 1979(E) Plastics—Unsaturated Polyester Resins—Part 1: Designation[3]

3. Classification

3.1 This specification covers the following types of polyester molding compounds:

3.1.1 *Type 1*—General-purpose, granular material with mineral fillers.

3.1.2 *Type 2*—General-purpose, granular material with mineral and cellulosic fillers, and having improved mechanical strength.

3.1.3 *Type 3*—General-purpose, putty-type material with mineral fillers.

3.1.4 *Type 4*—Putty-type material with mineral fillers having superior electrical properties.

3.1.5 *Type 5*—High-impact, glass-fiber filled material in mat form having good electrical properties.

3.1.6 *Type 6*—High-impact, glass-fiber filled material in putty form.

4. General Requirements

4.1 The molding compounds shall be of uniform composition, so compounded as to conform to the requirements prescribed in this specification.

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

NOTE 3—The terms "apparent density," "bulk factor," and "particle size" cannot be used in the same sense with putty-type and glass-filled materials as with granular materials.

5. Detail Requirements

5.1 Test specimens, molded by compression under conditions specified by the manufacturer, shall conform to the requirements prescribed in Table 1.

[1] This specification is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.16 on Thermosetting Materials.

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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.

[3] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

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

TABLE 1 Detail Requirements for Compression-Molded Test Specimens

	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Specific gravity, 23/23°C:						
min	2.18	1.6	1.7	1.9	1.95	1.75
max	2.28	1.9	1.9	2.1	2.10	1.90
Flexural strength, min:						
MPa	51.7	65.5	51.7	51.7	82.7	82.7
Modulus of elasticity in flexure, min:						
MPa	13 800	8 960	8 960	12 400	13 800	11 000
Impact resistance (Izod), min, J/m of notch	...	...	...	...	320(6)	320(6)
Arc resistance, min, s	175	125	125	175	130	75
Water absorption, 24 h, max, %	0.15	1.0	0.5	0.15	0.15	0.25

6. Sampling

6.1 A batch of molding compound shall be considered a unit of manufacture. It will potentially consist of a blend of two or more production runs of the same material.

6.2 Adequate statistical sampling shall be used.

7. Test Methods

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

7.1.1 *Conditioning*—Molded specimens shall be conditioned in accordance with Procedure B of Practice D618, except for the tests for arc resistance where Procedure A shall be used.

7.1.2 *Test Conditions*—Tests shall be conducted in the standard laboratory atmosphere of 23 ± 2°C and 50 ± 10 % relative humidity, unless otherwise specified in the test methods or in this specification.

7.1.3 *Specific Gravity*—Method A of Test Methods D792.

7.1.4 *Flexural Strength*—Test Methods D790, Procedure A.

7.1.5 *Modulus of Elasticity in Flexure*—Test Methods D790, Procedure A.

7.1.6 *Impact Resistance (Izod)*—Method A of Test Methods D256. Test specimens shall be 12.7 by 12.7 by 63.5 mm.

NOTE 4—Impact strength specimens may be cut from compression-molded 12.7 by 12.7-mm bars having lengths greater than 63.5 mm.

7.1.7 *Arc Resistance*—Test Method D495.

7.1.8 *Water Absorption*—Test Method D570, using the 24-h immersion procedure.

8. Number of Tests

8.1 One set of test specimens as prescribed in Section 7 shall be considered sufficient for testing each batch. The average result for the specimens tested shall conform to the requirements prescribed in this specification. All of the tests listed in Section 7 shall be used to establish conformity of a material to this specification. It is recommended that routine inspection be limited to those tests required to identify the material to the satisfaction of the purchaser. The purchaser shall state in the contract or order the tests which the manufacturer will be required to make on each shipment for identification of the material.

9. Rejection and Rehearing

9.1 It is acceptable for compounds that fail to conform to the requirements of this specification to be rejected. Rejection needs to be reported to the producer or supplier promptly and in writing. In case of dissatisfaction with the results of the test, the producer or supplier is entitled to make claim for a rehearing.

10. Packaging and Package Marking

10.1 *Packaging*—The compound shall be packaged in standard commercial containers, so constructed as to ensure acceptance by common or other carriers for safe transportation at the lowest rate to the point of delivery, unless otherwise specified in the contract or order.

10.2 *Package Marking*—Shipping containers shall be marked with the name of the compound, type, color, and the quantity contained therein as defined by the contract or order under which shipment is made, the name of the manufacturer, and the number of the contract or order.

10.3 All packing, packaging, and marking provisions of Practice D3892 shall apply to this specification.

11. Keywords

11.1 molding compounds (thermosetting); polyester; unsaturated polyester