Designation: D705 – 99 (Reapproved 2020)

Standard Specification for Urea-Formaldehyde Molding Compounds[1]

This standard is issued under the fixed designation D705; 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, urea-formaldehyde 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. Transfer or injection molding will usually result in different physical and electrical characteristics than compression molding.

1.3 The following safety hazards caveat pertains only to the test method portion, Section 7, of this specification: *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.*

NOTE 2—ISO 2112-1977(E) is similar but not equivalent to this specification. Product classification and characterization are not the same.

1.4 *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]

D149 Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies

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

D956 Practice for Compression Molding Specimens of Amino Molding Compounds (Withdrawn 1992)[3]

D3892 Practice for Packaging/Packing of Plastics

2.2 *ISO Standard:*

ISO 2112-1977(E) Plastics—Aminoplastic Moulding Materials—Specification[4]

3. Classification

3.1 The molding compounds covered by this specification shall be designated by types, based upon their principal characteristics and the fillers used.

3.1.1 *Type 1*—A general purpose molding compound with alpha-cellulose filler.

3.1.2 *Type 2*—A general purpose molding compound with cellulose filler other than alpha-cellulose.

4. General Requirements

4.1 The molding compounds shall be of uniform composition. The apparent density, bulk factor, plasticity, particle size, and color shall be compounded as to conform to the requirements prescribed in this specification.

5. Detail Requirements

5.1 Test specimens molded in accordance with Practice D956 shall conform to the requirements prescribed in Table 1.

6. Sampling

6.1 A batch of molding compound shall be considered as a unit of manufacture as prepared for shipment and may consist of a blend of two or more production runs.

[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] The last approved version of this historical standard is referenced on www.astm.org.

[4] 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

NOTE 1—ASTM Committee D20 on Plastics recognizes the existence of two types having essentially the same physical and electrical properties. The two types are continued, however, since Type 1 has unlimited color possibilities, while Type 2 is limited to a relatively few dark, opaque colors.

	Type 1	Type 2
Specific gravity, 23/23°C:		
min	1.45	1.45
Flexural strength, min:		
MPa	55.2	51.7
Impact resistance (Izod), min, J/m of notch	10.7	10.7
Water absorption, max, weight gain, %	2.0	2.0
Dielectric strength, 23°C, min, kV/mm:		
short-time test	11.8	11.8
step-by-step test	7.9	7.9
Arc resistance, min, s	80	...

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 Test Specimens*—Molded test specimens shall be conditioned in accordance with Procedure B of Practice D618, except for the tests for arc resistance and dielectric strength, where Procedure A shall be used.

7.1.2 *Test Conditions*—Tests shall be conducted in the standard laboratory atmosphere of 23 ± 1°C and 50 ± 2 % relative humidity, unless otherwise specified in the testing 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, Method I, using a 6.4 by 12.7 by 127-mm bar tested parallel to molding pressure.

7.1.5 *Impact Resistance (Izod)*—Method A of Test Methods D256, using a specimen measuring 12.7 by 12.7 by 63.5 mm and notched on the side parallel to the direction of molding pressure.

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

7.1.7 *Dielectric Strength*—Test Methods D149, except that the test specimens shall be compression-molded disks or plates 3.2 mm in thickness.

7.1.8 *Arc Resistance*—Test Method D495, using tungsten rod electrodes.

8. Packaging and Package Marking

8.1 *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.

8.2 *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.

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

9. Keywords

9.1 formaldehyde; molding compounds (thermosetting); urea-formaldehyde

SUMMARY OF CHANGES

Committee D20 has identified the location of selected changes to this standard since the last issue, D705 – 99(2012), that may impact the use of this standard. (December 1, 2020)

(1) Five year review. Reapproval without change.