



# Standard Specification for Urea-Formaldehyde Molding Compounds<sup>1</sup>

This standard is issued under the fixed designation D 705; 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 approval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope \*

1.1 This specification covers compression molding thermo-setting, 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 and health 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.

## 2. Referenced Documents

### 2.1 ASTM Standards:

- D 149 Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies<sup>2</sup>
- D 256 Test Method for Determining the Pendulum Impact Resistance of Notched Specimens of Plastics<sup>3</sup>
- D 495 Test Method for High-Voltage, Low-Current, Dry Arc Resistance of Solid Electrical Insulation<sup>2</sup>
- D 570 Test Method for Water Absorption of Plastics<sup>3</sup>
- D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing<sup>3</sup>
- D 790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials<sup>3</sup>

- D 792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement<sup>3</sup>
- D 956 Practice for Compression Molding Specimens of Amino Molding Compounds<sup>4</sup>
- D 3892 Practice for Packaging/Packing of Plastics<sup>5</sup>
- 2.2 ISO Standard:
  - ISO 2112-1977(E) Plastics—Aminoplastic Moulding Materials—Specification<sup>6</sup>

## 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 D 956 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.

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

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 10.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 08.01.

<sup>4</sup> Discontinued 1992; replaced by Practice D 5224. See *1991 Annual Book of ASTM Standards*, Vol 08.01.

<sup>5</sup> *Annual Book of ASTM Standards*, Vol 08.02.

<sup>6</sup> Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

\*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 D-20 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	...

Practice D 618, 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  $23 \pm 1^\circ\text{C}$  and  $50 \pm 2\%$  relative humidity, unless otherwise specified in the testing methods or in this specification.

7.1.3 *Specific Gravity*—Method A of Test Methods D 792.

7.1.4 *Flexural Strength*—Test Methods D 790, 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 D 256, 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 D 570, using the 24-h immersion procedure.

7.1.7 *Dielectric Strength*—Test Methods D 149, except that the test specimens shall be compression-molded disks or plates 3.2 mm in thickness.

7.1.8 *Arc Resistance*—Test Method D 495, 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 D 3892 shall apply to this specification.

## 9. Keywords

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

## SUMMARY OF CHANGES

This section identifies the location of selected changes to this specification. For the convenience of the user, Committee D-20 has highlighted those changes that may impact the use of this specification. This section also may include descriptions of the changes or reasons for the changes, or both.

### D 705–94:

- (1) ISO equivalency statement included as Note 2.
- (2) Keywords were added.
- (3) Sections regarding purchaser/producer agreements outside Practice D 1898 were removed.
- (4) Quality assurance (QA) provisions for government/military procurement were removed.

### D 705–99:

- (5) Editorial change to clarify scope.
- (6) Removed inch-pound units.
- (7) Deleted reference to Practice D 1898 as it has been discontinued without replacement.
- (8) Revised 6.2 deleting reference to Practice D 1898.
- (9) Added Summary of Changes section.

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