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ISO

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ISO RECOMMENDATION
R 295

PLASTICS
COMPRESSION MOULDING TEST SPECIMENS OF THERMOSETTING MATERIALS

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BRIEF HISTORY

The ISO Recommendation R 295, *Plastics—Compression Moulding Test Specimens of Thermosetting Materials*, was drawn up by Technical Committee ISO/TC 61, *Plastics*, the Secretariat of which is held by the American Standards Association, Inc. (ASA).

Work on this question by the Technical Committee began in 1954 and led, in 1958, to the adoption of a Draft ISO Recommendation.

In October 1959, this Draft ISO Recommendation (No. 320) was circulated to all the ISO Member Bodies for enquiry. It was approved by the following Member Bodies:

Australia	India	Romania
Austria	Israel	Spain
Belgium	Italy	Sweden
Burma	Japan	Switzerland
Chile	Mexico	United Kingdom
Czechoslovakia	Netherlands	U.S.A.
Germany	Poland	U.S.S.R.
Hungary	Portugal	

One Member Body opposed the approval of the Draft:

France.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council which decided, in February 1963, to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 295 February 1963

PLASTICS

COMPRESSION MOULDING TEST SPECIMENS OF THERMOSETTING MATERIALS

1. SCOPE

This ISO Recommendation is intended to serve as a basis for ensuring the preparation of equivalent test specimens from identical thermosetting compounds moulded under heat and pressure and the submission of equivalent and comparable statements in the reports issued by different testing organizations. This recommended practice applies only to thermosetting moulding materials such as phenoplasts, aminoplasts and polyesters and epoxy moulding compounds.

This ISO Recommendation, therefore, contains a general outline regarding the equipment and the normal methods of preparation of test specimens, as well as the particulars to be included in the reports concerning the preparation of the specimens.

In many cases, special procedures covering the preparation of the test specimens may be necessary depending on composition, flow properties and other variables. Such procedures should be made part of the procurement specifications, or agreed upon between seller and purchaser. Tables of the characteristic properties of test specimens should include reference to such special procedures.

2. APPARATUS

2.1 Compression mould

This moulding tool should be designed and constructed so that the force of compression is transmitted to the plastics without appreciable losses until the conclusion of the compression cycle. A three-part mould consisting of a shell and an upper and a lower die has been found satisfactory for this purpose. Other moulds may be used, where it can be shown that equivalent results are obtained.

The dimensions of the mould cavity should be such that the compound can be introduced in one single charge. It may be necessary eventually, especially for bulky materials, to agree on a method of tabletting prior to introduction into the mould.

2.1.1 *Ejector pin*

In order to ensure the preparation of plane or flat moulded shapes without subsequent distortion, it is preferred that they be ejected from the mould with the entire mould bottom. Ejector pins may be used, if equivalent results can be obtained.

NOTES

1. In order to facilitate the removal of the moulded shapes from the mould, it is permissible to design the mould walls with a draft of not more than one-half degree.

2. Pronounced burring is associated with a correspondingly strong local flow of moulding compound, resulting in test specimens exhibiting partly deformed shapes and deviating properties.

2.1.2 *Temperature control device*

Moulds are provided with efficient heat regulation so that the optimum temperatures required can be maintained constant within a range of ± 3 °C in all sections of the mould; i.e., the mould temperature should not deviate from the nominal temperature in temporal and spatial respects* by more than ± 3 °C.

Bore-holes for the introduction of pyrometric of thermometric heat-measuring devices are provided in the three main parts of the moulds. The surface of the mould walls should be chromium-plated and brightly polished. The compression face of the lower die should carry a mark indicating on the moulded shape the surface which has been formed by the lower die. Care should be taken to ensure that such marks do not interfere with subsequent testing.

NOTES

1. The two main surfaces of test specimens are not exactly equivalent with regard to all their properties, since, during the period between filling and compacting, the surface of the shape directed toward the lower die is heated longer and to a higher temperature than the other surface. It may therefore be advisable in preparing test methods, specifications, property tables, etc., to state the particular surface to which specifications or properties should be referred.

2. Standardization of moulding tools of specific design is in progress.

2.2 Compression moulding press

Any press capable of exerting and maintaining the pressure and times prescribed for the particular material being moulded and within the prescribed tolerances is suitable for this purpose.

2.3 Heating device

The moulds should be provided with direct heating designed to ensure uniform and constant moulding temperatures within the range of tolerances stated in clause 2.1.2.

3. CONDITIONING

3.1 Unless otherwise required by the material specifications, moulding materials are pressed as received.

3.2 In the case of referee tests, the moulding materials should be conditioned for 72 hours over a desiccant, as, for example, anhydrous calcium chloride, immediately prior to moulding. Where moulding materials are so bulky that conventional moulds have insufficient loading capacity, the materials may be pre-compressed (tabletted). The tabletting conditions can be determined by agreement between supplier and buyer.

* *Spatial temperature differences:* Differences of temperature existing simultaneously at various points of the interior of the moulds after the temperature control has been definitely fixed and a state of permanent thermal equilibrium attained.

Temporal temperature deviations: Deviations of temperature which may occur at one and the same point of the interior of the mould at different times after the temperature control has been definitely fixed and a state of permanent thermal equilibrium attained.