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(ISO 293 : 1986)

**Plastics—Compression moulding
test specimens of thermoplastic
materials**

ICS 83.080.20

Descriptors : plastics, vinyl resins, samples

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

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In the event of any doubts arising as to the contents,
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Plastics — Compression moulding test specimens of thermoplastic materials

Foreword for Japanese Industrial Standard

This Japanese Industrial Standard has been prepared based on the second edition issued in 1986 of ISO 293, *Plastics — Compression moulding test specimens of thermoplastic materials* without changing the technical contents.

0 Introduction For reproducible test results, specimens with a defined state are required. In contrast to injection moulding, the aim of compression moulding is to produce test specimens and sheets for machining or stamping of test specimens that are homogeneous and isotropic.

In the process of compression moulding, mixing of material takes place on a negligible scale. Granules and powders fuse only at their surfaces and preforms (milled sheets) are only partially softened.

Isotropic and homogeneous specimens can, therefore, only be obtained when the moulding material is itself homogeneous and isotropic. This has to be considered when processing multiphase materials, such as ABS, which retain their internal structure.

1 Scope and field of application This Japanese Industrial Standard specifies the general principles and the procedures to be followed with thermoplastics in the preparation of compression-moulded test specimens and sheets from which test specimens may be machined or stamped.

In order to obtain mouldings in a reproducible state, the main steps of the procedure, including four different cooling methods, are standardized. For each material, the required moulding temperature and cooling methods shall be as specified in the appropriate Standard for the material or as agreed between the interested parties.

Remarks: The procedure is not recommended for reinforced thermoplastics.

2 References The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

ISO/R 286:1982 *ISO system of limits and fits—Part 1 : General, tolerances and deviations.*

ISO 468:1982 *Surface roughness—Parameters, their values and general rules for specifying requirements.*

3 Definitions For the purpose of this Standard, the following definitions apply.

3.1 moulding temperature : The temperature of the mould or the press platens during the preheating and moulding time, measured in the nearest vicinity to the moulded material.

3.2 demoulding temperature : The temperature of the mould or the press platens at the end of the cooling time, measured in the nearest vicinity to the moulded material.

Remarks: For positive moulds, holes are normally drilled in the mould for measuring the temperatures defined in 3.1 and 3.2.

3.3 preheating time : The time required to heat the material in the mould up to the moulding temperature while maintaining the contact pressure.

3.4 moulding time : The time during which full pressure is applied while maintaining the moulding temperature.

3.5 average cooling rate (non-linear) : Rate of cooling by a constant flow of the cooling fluid, calculated by dividing the difference between moulding and demoulding temperatures by the time required to cool the mould to the demoulding temperature.

The average cooling rate is usually expressed in kelvins per minute.

3.6 cooling rate : Constant rate of cooling in a defined temperature range obtained by controlling the flow of the cooling fluid in such a way that over each 10 min interval the deviation from this specified cooling rate shall not exceed the specified tolerance.

The cooling rate is usually in kelvins per hour.

4 Apparatus

4.1 Moulding press The press shall have a clamping force capable of applying a pressure (conventionally given as the ratio of the clamping force to the area of the mould cavity) of at least 10 MPa.

The pressure shall be maintained to within 10 % of the specified pressure during the moulding cycle.

The platens shall be capable of

- a) being heated at least 240 °C ;
- b) being cooled at a rate given in the Table 1.