

INTERNATIONAL STANDARD

ISO 294

Second edition
1995-02-01

Plastics — Injection moulding of test specimens of thermoplastic materials

*Plastiques — Moulage par injection des éprouvettes en matériaux
thermoplastiques*



Reference number
ISO 294:1995(E)



Documents
Document Sharing Hub

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 294 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

This second edition cancels and replaces the first edition (ISO 294:1975), of which it constitutes a technical revision.

Annex A of this International Standard is for information only.

Introduction

Many factors in the injection-moulding process can influence the properties of moulded test specimens and hence the results of tests using such specimens. The mechanical properties, in particular, of test specimens are strongly dependent on the conditions of the moulding process used to prepare the specimens.

An exact definition of each parameter of the moulding process is essential to ensure reproducible and comparable operating conditions.

It is important in defining the moulding conditions for a thermoplastic material to consider any dependence of the properties to be determined and the conditions used in the moulding process. Thermoplastics may exhibit molecular orientation (important mainly with heterogeneous polymers) or differences in crystallinity (for crystalline or semi-crystalline polymers). Residual ("frozen-in") stresses in the moulded specimens and thermal degradation of the polymer during moulding may also influence the properties of the specimens.

Each of these phenomena must be controlled to avoid fluctuation in the numerical values of test results.

General correlations between the properties of test specimens and basic injection-moulding parameters are given, for information only, in annex A.

Plastics — Injection moulding of test specimens of thermoplastic materials

1 Scope

This International Standard specifies the general principles to be followed when injection moulding test specimens of thermoplastic materials. It describes two preferred mould designs and gives examples of other acceptable mould designs. It provides a basis for establishing reproducible moulding conditions. Its purpose is to promote uniformity in describing the essential moulding parameters and also to establish uniform practice in reporting moulding conditions. The exact conditions required to prepare specimens in a defined, reproducible state will vary for each material, mould and machine used. These conditions shall be agreed upon between interested parties unless they are part of an International Standard for the relevant material.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 179:1993, *Plastics — Determination of Charpy impact strength*.

ISO 180:1993, *Plastics — Determination of Izod impact strength*.

ISO 527-1:1993, *Plastics — Determination of tensile properties — Part 1: General principles*.

ISO 527-2:1993, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics*.

ISO 3167:1993, *Plastics — Multipurpose test specimens*.

ISO 5725-1:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 1: General principles and definitions*.

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 mould temperature: The average temperature of the mould cavity surface measured after the system has attained thermal equilibrium and immediately after opening the mould (see also 5.3).

It is expressed in degrees Celsius, °C.

3.2 melt temperature: The temperature of the molten plastic in a free shot (see also 5.4).

It is expressed in degrees Celsius, °C.

3.3 injection pressure: The maximum pressure applied to the plastic material in front of the screw during injection (see figure 1).

It is expressed in megapascals, MPa.

3.4 hold pressure: The pressure applied to the plastic material in front of the screw during the hold time (see figure 1).

It is expressed in megapascals, MPa.

3.5 moulding cycle: The complete sequence of moulding operations required for the production of a