INTERNATIONAL STANDARD

ISO 2557-1

Second edition
1989-10-01

Plastics — Amorphous thermoplastics — Preparation of test specimens with a specified maximum reversion —

Part 1: Bars

Plastiques — Thermoplastiques amorphes — Préparation des éprouvettes à niveau de retrait maximal spécifié —

Partie 1: Barres

Reference number
ISO 2557-1 : 1989 (E)

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 approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 2557-1 was prepared by Technical Committee ISO/TC 61, *Plastics.*

This second edition cancels and replaces the first edition (ISO 2557-1 : 1976), of which it constitutes a technical revision.

ISO 2557 consists of the following parts, under the general title *Plastics — Amorphous thermoplastics — Preparation of test specimens with a specified maximum reversion*:

— *Part 1: Bars*

— *Part 2: Plates*

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Introduction

The properties of test specimens of amorphous thermoplastic materials are influenced by their molecular orientation. In particular, molecular orientation has a pronounced effect on mechanical properties. Reproducible test results can only be obtained by using test specimens that are in the same state of orientation.

The amount of orientation can be assessed by measuring the maximum reversion of the specimens at an elevated temperature under specified conditions. For industrial purposes the condition of similar state of orientation is reasonably fulfilled when the measured maximum reversions of test specimens after a specified heat treatment are equal.

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Plastics — Amorphous thermoplastics — Preparation of test specimens with a specified maximum reversion —

Part 1: Bars

1 Scope

This part of ISO 2557 specifies procedures for the preparation of test specimens of amorphous thermoplastic materials in the form of bars with a specified level of uniaxial molecular orientation which is characterized by determination of the maximum reversion R_m in accordance with ISO 8328.

It is not applicable to fibre reinforced thermoplastics or cellular plastics.

ISO 2557-2 specifies procedures for the preparation of test specimens of amorphous thermoplastic materials in the form of plates with a specified level of uniaxial molecular orientation.

The conditions required to produce a specified state of the material need to be determined for each type of moulding material. The recommended procedure will depend on the required or specified maximum reversion. To produce test specimens in the basic state, having almost no molecular orientation and a maximum reversion of nearly zero, compression moulding and thermal relaxation are the recommended procedures. Test specimens with uniaxial molecular orientation and a maximum reversion greater than that of the basic state can be obtained by injection moulding.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 2557. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 2557 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 293 : 1986, *Plastics — Compression moulding test specimens of thermoplastic materials.*

ISO 294 : 1975, *Plastics — Injection moulding test specimens of thermoplastic materials.*

ISO 306 : 1987, *Plastics — Thermoplastic materials — Determination of Vicat softening temperature.*

ISO 472 : 1988, *Plastics — Vocabulary.*

ISO 2557-2 : 1986, *Plastics — Amorphous thermoplastics — Preparation of test specimens with a specified reversion — Part 2: Plates.*

ISO 2818 : 1980, *Plastics — Preparation of test specimens by machining.*

ISO 8328 : 1989, *Plastics — Amorphous thermoplastic moulding materials — Determination of reversion.*

3 Definitions

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

3.1 state of a specimen: The condition of a specimen as characterized by its maximum longitudinal reversion.

3.2 basic state of a specimen: The state in which a specimen is nearly free of internal stresses and molecular orientation. A specimen is considered to be in its basic state if, after the heat treatment specified in ISO 8328,

— the surface does not change;

— its maximum reversion is nearly zero.

The maximum reversion in the basic state will depend on the type of thermoplastic and shall be as specified in the relevant material standard.

4 Apparatus

4.1 Injection moulding

4.1.1 Injection-moulding machine, of the hydraulic reciprocating-screw type, with associated processing control system, as specified in ISO 294.