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

**Part 2:  
Small tensile bars**

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

*Partie 2: Barreaux de traction de petites dimensions*

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## 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

This second edition cancels and replaces the first edition (ISO 294-2:1996), of which it constitutes a minor revision to update the references in [Clause 2](#). It also incorporates the Amendment ISO 294-2:1996/Amd 1:2004.

A list of all parts in the ISO 294 series can be found on the ISO website.

# Plastics — Injection moulding of test specimens of thermoplastic materials —

## Part 2: Small tensile bars

### 1 Scope

This document specifies a four-cavity mould, the type C ISO mould, for the injection moulding of small tensile bars measuring  $\geq 60 \text{ mm} \times 10 \text{ mm} \times 3 \text{ mm}$  (the type CW11 test specimen in ISO 20753).

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 294-1:2017, *Plastics — Injection moulding of test specimens of thermoplastic materials — Part 1: General principles, and moulding of multipurpose and bar test specimens*

ISO 20753, *Plastics — Test specimen*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 294-1 apply.

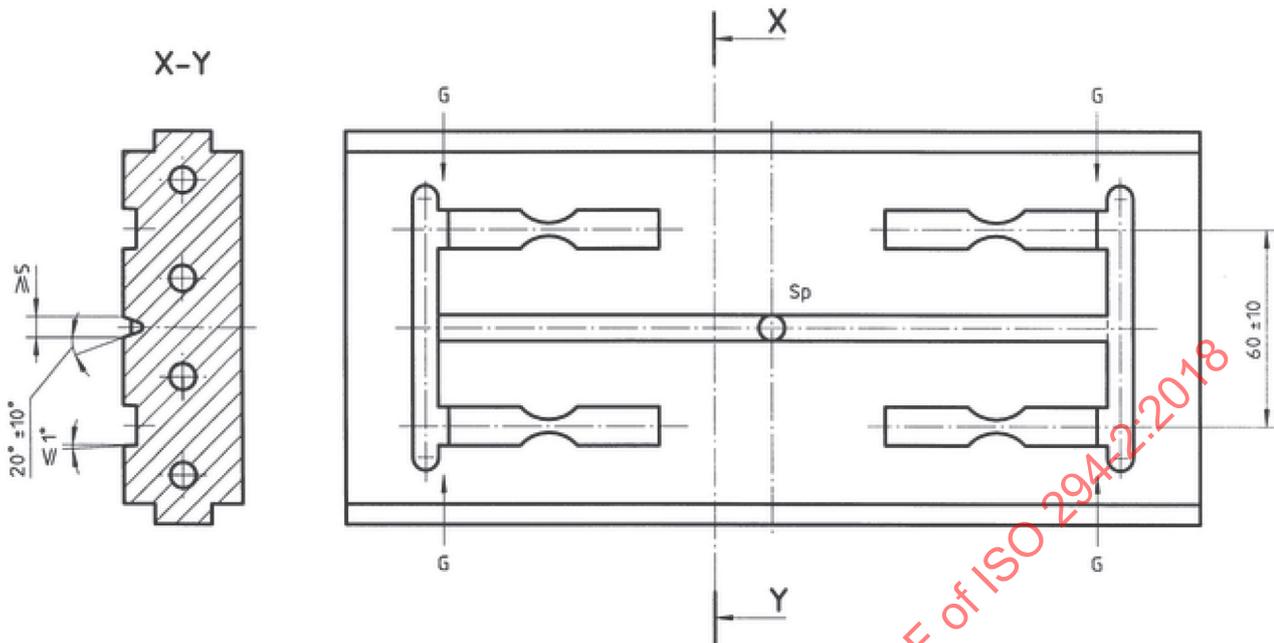
ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

### 4 Apparatus

#### 4.1 Type C ISO mould

The type C ISO mould is a four-cavity mould with a double-T runner (see [Figure 1](#)) intended for the preparation of small tensile bars to be used for the measurement of so-called “indicative” properties when studying the effects of environmental influences, such as liquid chemicals, heat or weathering, on plastics (see ISO 11403-3). The bar mouldings produced using this mould shall have the dimensions of the type CW11 specimen defined in ISO 20753 plus a thickness of  $3,0 \text{ mm} \pm 0,2 \text{ mm}$ .



**Key**

- Sp sprue moulding volume  $V_M$  approximately 24 000 mm<sup>3</sup>
- G gate projected area  $A_p = 5\,500$  mm<sup>2</sup>

**Figure 1 — Cavity plate for a type C ISO mould**

The main constructional details of the type C ISO mould shall be as shown in [Figure 1](#) and shall meet the requirements given in ISO 294-1:2017, 4.1.1.4 items a) to n), with the following exception:

- “g) The dimensions of the test specimens refer to ISO 20753 type CW11, i.e. the main dimensions, in millimetres, of the cavities shall be as follows:
  - width of central section: 3,0 to 3,1;
  - radius of curvature: 15 to 16.”

The thickness of the test specimens shall be 3,0 mm ± 0,2 mm, i.e. the depth of the cavities shall be 3,0 mm to 3,2 mm.

**4.2 Injection-moulding machine**

See ISO 294-1:2017, 4.2, with the following exception:

“In ISO 294-1:2017, 4.2.5, the recommended minimum locking force  $F_M$  for the type C ISO mould is given by  $F_M \geq 5\,500 \times p_{max} \times 10^{-3}$ , i.e. 440 kN for a maximum melt pressure of 80 MPa.”

**5 Procedure**

**5.1 Conditioning of material**

See ISO 294-1:2017, 5.1.

**5.2 Injection moulding**

See ISO 294-1:2017, 5.2, but with the following new text for ISO 294-1:2017, 5.2.2.

For the type C ISO mould, it is recommended that the injection velocity,  $v_I$ , be chosen such that the injection time,  $t_I$ , is comparable to that used for the type A ISO mould.

NOTE 1 The cavities in the type C ISO mould have a low critical cross-sectional area  $A_c$  of only 9 mm<sup>2</sup>, i.e. much lower than that for the type A ISO mould (40 mm<sup>2</sup>). If the same injection speed  $v_I$  were used for the type C mould as for the type A mould, this would result in a low screw advance speed and hence a low melt speed in the runners and a low melt temperature before the melt enters the cavities of the type C mould. Using the recommended common injection time  $t_I$ , however, the injection velocity  $V_I$  for the type C mould is about twice that recommended for the type A mould [see ISO 294-1:2017, Formula (3)].

NOTE 2 This document does not address the question of changes in screw advance speed, e.g. high speeds when filling the runners and low speeds when filling the cavities. As a result of the inertia of the injection-moulding machine, peaks in melt pressure and/or injection speed often cannot be avoided if the screw advance speed is changed during injection.

## 6 Report on test-specimen preparation

The report shall include the following information:

- a) a reference to this document, i.e. ISO 294-2:2018;
- b) to h): see ISO 294-1:2017, Clause 6, items b) to h).

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## Bibliography

- [1] ISO 11403-3, *Plastics — Acquisition and presentation of comparable multipoint data — Part 3: Environmental influences on properties*

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