

Plastics - Compression moulding of test specimens of thermoplastic materials (ISO 293:2023)

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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| Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 08.03.2023. | Date of Availability of the European standard is 08.03.2023. |
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ICS 83.080.20

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EUROPEAN STANDARD

EN ISO 293

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2023

ICS 83.080.20

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English Version

Plastics - Compression moulding of test specimens of thermoplastic materials (ISO 293:2023)

Plastiques - Moulage par compression des éprouvettes en matières thermoplastiques (ISO 293:2023)

Kunststoffe - Formgepresste Probekörper aus Thermoplasten (ISO 293:2023)

This European Standard was approved by CEN on 24 February 2023.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

This document (EN ISO 293:2023) has been prepared by Technical Committee ISO/TC 61 "Plastics" in collaboration with Technical Committee CEN/TC 249 "Plastics" the secretariat of which is held by NBN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2023, and conflicting national standards shall be withdrawn at the latest by September 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 293:2005.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Endorsement notice

The text of ISO 293:2023 has been approved by CEN as EN ISO 293:2023 without any modification.

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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).

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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.

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 249, *Plastics*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 293:2004), which has been technically revised.

The main changes are as follows:

- the definition for “cooling rate” has been revised (see [3.6](#));
- requirements regarding the biggest clamping force and the highest platens temperature have been changed (see [4.1](#));
- the description of common specifications of positive mould has been given (see [4.2.3.3](#));
- the conditions for the use of vacuum oven while material drying have been added (see [5.1.1](#));
- the methods of cooling rate have been revised (see [Table 1](#));
- a bibliography has been added.

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.

Introduction

For reproducible test results, specimens with a specified 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.

The cooling rate in the crystallization stage has a great influence on the properties of semi-crystalline or crystalline polymer (such as PB, PE, PP, etc.), so it is necessary to control the cooling rate more strictly at the cooling stage.

Plastics — Compression moulding of test specimens of thermoplastic materials

1 Scope

This document 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 can be machined or stamped.

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

This document is not applicable to reinforced thermoplastics.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

3.1

moulding temperature

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

Note 1 to entry: The moulding temperature is usually expressed in degrees Celsius.

3.2

demoulding temperature

temperature of the mould or the press platens at the end of the cooling time, measured in the nearest vicinity to the moulded material

Note 1 to entry: The demoulding temperature is usually expressed in degrees Celsius.

3.3

preheating time

time required to heat the material in the mould up to the *moulding temperature* (3.1) while maintaining the contact pressure

Note 1 to entry: The preheating time is usually expressed in minute.

3.4

moulding time

time during which full pressure is applied while maintaining the *moulding temperature* (3.1)

Note 1 to entry: The moulding time is usually expressed in minute.