

<b>STN</b>	<b>Plasty</b> <b>Získavanie a prezentácia porovnateľných</b> <b>viacbodových hodnôt</b> <b>Časť 2: Tepelné a spracovateľské vlastnosti</b> <b>(ISO 11403-2: 2022)</b>	<b>STN</b> <b>EN ISO 11403-2</b>  64 0010
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Plastics - Acquisition and presentation of comparable multipoint data - Part 2: Thermal and processing properties (ISO 11403-2:2022)

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 10/22

Obsahuje: EN ISO 11403-2:2022, ISO 11403-2:2022

Oznámením tejto normy sa ruší  
STN EN ISO 11403-2 (64 0010) z marca 2013

**135769**

EUROPEAN STANDARD

**EN ISO 11403-2**

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2022

ICS 83.080.01

Supersedes EN ISO 11403-2:2012

English Version

**Plastics - Acquisition and presentation of comparable  
multipoint data - Part 2: Thermal and processing  
properties (ISO 11403-2:2022)**

Plastiques - Acquisition et présentation de données  
multiples comparables - Partie 2: Propriétés  
thermiques et caractéristiques relatives à la mise en  
oeuvre (ISO 11403-2:2022)

Kunststoffe - Ermittlung und Darstellung von  
vergleichbaren Vielpunkt-Kennwerten - Teil 2:  
Thermische und Verarbeitungseigenschaften (ISO  
11403-2:2022)

This European Standard was approved by CEN on 23 July 2022.

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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**

**EN ISO 11403-2:2022 (E)**

<b>Contents</b>	<b>Page</b>
<b>European foreword.....</b>	<b>3</b>

## **European foreword**

This document (EN ISO 11403-2:2022) 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of an identical text or by endorsement, at the latest by February 2023, and conflicting national standards shall be withdrawn at the latest by February 2023.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 11403-2:2012.

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 11403-2:2022 has been approved by CEN as EN ISO 11403-2:2022 without any modification.

# INTERNATIONAL STANDARD

# ISO 11403-2

Fourth edition  
2022-07

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## Plastics — Acquisition and presentation of comparable multipoint data —

### Part 2: Thermal and processing properties

*Plastiques — Acquisition et présentation de données multiples  
comparables —*

*Partie 2: Propriétés thermiques et caractéristiques relatives à la mise  
en œuvre*



Reference number  
ISO 11403-2:2022(E)

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Published in Switzerland

# Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Specimen preparation</b> .....	<b>2</b>
<b>5 Conditioning</b> .....	<b>2</b>
<b>6 Test requirements</b> .....	<b>2</b>
6.1 General.....	2
6.2 Enthalpy/temperature curve: ISO 11357-3.....	3
6.3 Linear-expansion/temperature curve: ISO 11359-2.....	4
6.4 Melt shear viscosity: ISO 11443.....	4
<b>7 Presentation of data</b> .....	<b>5</b>
<b>8 Precision</b> .....	<b>6</b>
<b>Annex A (informative) Other properties</b> .....	<b>7</b>
<b>Bibliography</b> .....	<b>8</b>

## ISO 11403-2:2022(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.

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 2, *Mechanical behaviour*, 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 11403-2:2012), which has been technically revised.

The main changes are as follows:

- the titles of [Figure 1](#) and [Figure 2](#) have been modified and Key tables have been added;
- the procedure for getting enthalpy/temperature curve ([6.2](#)) has been updated;
- the procedure for getting linear-expansion/temperature curve ([6.3](#)) has been updated;
- footnotes regarding transition temperatures have been added in [Tables 2](#) and [3](#);
- an explanation that [Clauses 4](#) and [5](#) do not apply in to enthalpy/temperature curve and melt shear viscosity, [6.2](#) and [6.4](#) respectively, has been added.

A list of all parts in the ISO 11403 series can be found on the ISO website.

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).

## Introduction

This document has been prepared because users of plastics find sometimes that available data cannot be used readily to compare the properties of similar materials, especially when the data have been supplied by different sources. Even when the same standard tests have been used, they often allow the adoption of a wide range of alternative test conditions, and the data obtained are not necessarily comparable. The purpose of this document is to identify specific methods and conditions of test to be used for the acquisition and presentation of data in order that valid comparisons between materials can be made.

The ISO 10350 series is concerned with single-point data. Such data represent the most basic method for characterizing materials and are useful for the initial stages of material selection. This document identifies test conditions and procedures for the measurement and presentation of a more substantial quantity of data. Each property here is characterized by multipoint data which demonstrate how that property depends upon important variables such as time, temperature and environmental effects. Additional properties are also considered in this document. These data, therefore, enable more discriminating decisions to be made regarding a material's suitability for a particular application. Some data are also considered adequate for undertaking predictions of performance in service and of optimum processing conditions for moulding a component, although it should be recognized that, for purposes of design, additional data will often be needed. One reason for this is that some properties are strongly dependent upon the physical structure of the material. The test procedures referred to in this document employ, where possible, the multipurpose tensile bar, and the polymer structure in this test specimen may be significantly different from that in specific regions of a moulded component. Under these circumstances, therefore, the data will not be suitable for accurate design calculations for product performance. The material supplier should be consulted for specific information on the applicability of data.

The ISO 10350 series and the ISO 11403 series, together, define the means for acquiring and presenting a core set of comparable data for use in material selection. Use of these International Standards results in a rationalization of effort and a reduction of cost associated with provision of these data. Furthermore, reference to these standards will simplify the development of data models for the computerized storage and exchange of data concerning material properties.

Where appropriate, values for test variables have been specified by this document. For some tests however, owing to the wide range of conditions over which different plastics perform, the standard gives guidance in the selection of certain test conditions so that they cover the operating range for that polymer. Because, in general, the properties and performance specifications for different polymers differ widely, there is no obligation to generate data under all the test conditions specified in this document.

Data on a wide range of properties are needed to enable plastics to be selected and used in the large variety of applications to which they are suited. ISO standards describe experimental procedures which are suitable for the acquisition of relevant information on many of these properties. For other properties, however, ISO standards either do not exist or exhibit shortcomings that complicate their use at present for the generation of comparable data (see [Annex A](#)). The ISO 11403 series has therefore been divided into parts so that each part can be developed independently. In this way, additional properties can be included as new or revised standards become available.

# Plastics — Acquisition and presentation of comparable multipoint data —

## Part 2: Thermal and processing properties

### 1 Scope

This document specifies test procedures for the acquisition and presentation of multipoint data on the following thermal and processing properties of plastics:

- enthalpy/temperature curve;
- linear-expansion/temperature curve;
- melt shear viscosity.

### 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 293, *Plastics — Compression moulding of test specimens of thermoplastic materials*

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

ISO 295, *Plastics — Compression moulding of test specimens of thermosetting materials*

ISO 472, *Plastics — Vocabulary*

ISO 1133 (all parts), *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics*

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

ISO 10724-1, *Plastics — Injection moulding of test specimens of thermosetting powder moulding compounds (PMCs) — Part 1: General principles and moulding of multipurpose test specimens*

ISO 20753, *Plastics — Test specimens*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**