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Plastics — Thermomechanical analysis (TMA) —

Part 1: General principles

Plastiques — Analyse thermomécanique (TMA) —

Partie 1: Principes généraux

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Contents

Page

Foreword ..... **iv**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Principle **1**
5 Apparatus **1**
6 Test specimens **2**
7 Procedure **3**
7.1 Calibration 3
7.1.1 General 3
7.1.2 Displacement transducer 5
7.1.3 Load-application device 5
7.2 Correction of the measured displacement 5
7.2.1 Blank correction 5
7.2.2 Correction for displacement of the measuring probe 6
7.3 Determination 7
8 Test report **7**
Bibliography **8**

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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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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 5, *Physical-chemical properties*.

This third edition cancels and replaces the second edition (ISO 11359-1:2014), which has been technically revised.

The main changes are as follows:

— the optional use of a cooling device has been added;

— the temperature calibration using the single sensor-DTA technique has been added;

— additional temperature calibration specimens have been specified for different deformation techniques;

— the list of temperature calibration substances has been extended;

— a correction method taking into account the influence of the change of length of the measuring probe 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.

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Plastics — Thermomechanical analysis (TMA) —

Part 1: General principles

WARNING — The use of this document can involve hazardous materials, operations and equipment. It does not purport to address all of the safety or environmental problems associated with its use.

1 Scope

This document specifies the general conditions for the thermomechanical analysis of thermoplastics and thermosetting materials, filled or unfilled, in the form of sheet or moulded parts.

Thermomechanical analysis consists of the determination of deformations of a test specimen under constant load as a function of temperature and/or time.

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 291, *Plastics — Standard atmospheres for conditioning and testing*

ISO 472, *Plastics — Vocabulary*

ISO 11359-2, *Plastics — Thermomechanical analysis (TMA) — Part 2: Determination of coefficient of linear thermal expansion and glass transition temperature*

ISO 11359-3, *Plastics — Thermomechanical analysis (TMA) — Part 3: Determination of penetration temperature*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 472 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 https://www.electropedia.org/

4 Principle

The deformation of a material under constant or variable stress is measured as a function of time at a constant temperature or as a function of temperature.

5 Apparatus

The components of a basic thermomechanical analyser consist of the following.

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