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Rubber, vulcanized or thermoplastic — Determination of low-temperature stiffening (Gehman test)

Caoutchouc vulcanisé ou thermoplastique — Détermination de la rigidité à basse température (Essai Gehman)

Reference number
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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 45, *Rubber and rubber products*, Subcommittee SC 2, *Testing and analysis*.

This fifth edition cancels and replaces the fourth edition (ISO 1432:2013), which has been technically revised.

The main changes compared to the previous edition are as follows:

— in Clause 2, normative references have been updated;

— a precision statement has been added as Annex B.

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Rubber, vulcanized or thermoplastic — Determination of low-temperature stiffening (Gehman test)

WARNING 1 — Persons using this document should be familiar with normal laboratory practice. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to determine the applicability of any other restrictions.

WARNING 2 — Certain procedures specified in this document might involve the use or generation of substances, or the generation of waste, that could constitute a local environmental hazard. Reference should be made to appropriate documentation on safe handling and disposal after use.

1 Scope

This document specifies a static procedure, known as the Gehman test, for determining the relative stiffness characteristics of vulcanized or thermoplastic rubbers over a temperature range from room temperature to approximately –120 °C.

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 18899:2013, *Rubber — Guide to the calibration of test equipment*

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

3 Terms and definitions

No terms and definitions are listed in this document.

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 Principle

The torsional stiffness is measured as a function of temperature, starting from a low temperature. The stiffness is measured by connecting the test piece in series with a calibrated spring wire and measuring the angle of twist of the test piece when the top of the wire is turned 180°.

5 Apparatus

5.1 Torsion apparatus, consisting of a torsion head, capable of being turned 180° in a plane normal to the torsion wire. The top of the wire is fastened to the torsion head. The bottom of the wire is fastened to the test piece clamp. A device for “friction-free” indication or recording of angle by mechanical or electrical means shall be provided, permitting convenient and exact adjustment of the zero point. The indicating or recording system shall allow reading or recording of the angle of twist to the nearest degree. This principle is shown in Figure 1.

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