INTERNATIONAL STANDARD

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 1432 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 2, *Testing and analysis*.

This fourth edition cancels and replaces the third edition (ISO 1432:1988), which has been technically revised to allow computerized instruments to be used. In addition, a calibration schedule has been added (see Annex A). It also incorporates the Technical Corrigendum ISO 1432:1988/Cor.1:2003.

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WARNING — Persons using this International Standard should be familiar with normal laboratory practice. This standard 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 ensure compliance with any national regulatory conditions.

CAUTION — Certain procedures specified in this International Standard 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 International Standard 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 –150 °C.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 18899:2004, *Rubber — Guide to the calibration of test equipment*

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

3 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°.

4 Apparatus

4.1 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.

4.2 Torsion wires, made of tempered spring wire, of a length of 65 mm ± 8 mm, and having nominal torsional constants of 0,7 mN·m, 2,8 mN·m and 11,2 mN·m. In cases of dispute, the 2,8 mN·m wire shall be used.