
**Rubber — Determination of
crystallization effects by hardness
measurements**

*Caoutchouc — Détermination des effets de la cristallisation au moyen
de mesurages de dureté*



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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 fourth edition cancels and replaces the third edition (ISO 3387:2012), which has been technically revised.

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

- The normative references have been updated in [Clause 2](#).
- How to select method and how to make measurement have been explained in more detail in [9.1](#).
- Information about original hardness measurement has been revised in [9.2](#).

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.

Rubber — Determination of crystallization effects by hardness measurements

1 Scope

This document specifies a test based on hardness measurements for determining the progressive stiffening of rubber with time, caused by crystallization. It is limited to materials having an initial hardness at a test temperature of from 10 IRHD to 85 IRHD.

The method is applicable to raw, unvulcanized (compounded) and vulcanized rubber. It is mainly of interest for rubber with a marked crystallization tendency at temperatures experienced in cold climates, such as chloroprene and natural rubber.

The method is not applicable to fast-crystallizing materials which crystallize to a considerable degree within the timespan of 15 min used for conditioning at test temperature.

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 48-2:2018, *Rubber, vulcanized or thermoplastic — Determination of hardness — Part 2: Hardness between 10 IRHD and 100 IRHD*

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

One or the other of the following measurements is made on a test piece stored at the desired temperature:

- a) the increase in hardness after a specified storage time;
- b) the time required for a specified increase in hardness to occur.