

Nederlandse norm

NEN-ISO 4666-4

(en)

Gevulcaniseerde rubber - Bepaling van de temperatuurstijging en de vermoeiingsweerstand bij beproeving met een flexometer - Deel 4: Constante spanningsflexometer (ISO 4666-4:2018,IDT)

Rubber vulcanized - Determination of temperature rise and resistance to fatigue in flexometer testing - Part 4: Constant-stress flexometer (ISO 4666-4:2018,IDT)

Vervangt NEN-ISO 4666-4:2007

ICS 83.060
oktober 2018

Als Nederlandse norm is aanvaard:

- ISO 4666-4:2018, IDT

Normcommissie 342045 'Rubber'



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Preview

FOR RELEASE

Rubber, vulcanized — Determination of temperature rise and resistance to fatigue in flexometer testing —

**Part 4:
Constant-stress flexometer**

Caoutchouc vulcanisé — Détermination de l'élévation de température et de la résistance à la fatigue dans les essais aux flexomètres —

Partie 4: Flexomètre à contrainte constante



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Published in Switzerland

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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. 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 the following URL: <http://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 second edition cancels and replaces the first edition (ISO 4666-4:2007), which has been technically revised.

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

- in [Clause 11](#), the requirement for the temperature at breakdown has been added in the test report.
- the former [Annex B](#), Guidance for using precision results, has been removed.
- calibration schedule has been added as new [Annex B](#).

A list of all parts in the ISO 4666 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.

Introduction

This document describes a method of compression flexometer testing with constant-stress dynamic loading. The features and usefulness of constant-stress flexometer testing are as follows:

- a) In order to exactly simulate the behaviour of a rubber product in use, an important consideration is where the temperature is measured. The constant-stress flexometer measures the temperature directly at the centre of the inside of the test piece (the source of heat generation), using a device as shown in [Figure 4](#) of this document, while in ISO 4666-3 the temperature is measured on the surface of the test piece.
- b) A servo control system based on real-time feedback of the strain or stress is used to enable the measurement of dynamic properties (viscoelastic parameters) of the rubber as a function of time during the test run.
- c) The accumulation of feedback information allows the detection of an initial stage, or the first signs of breakdown due to heat generation, which was once thought to be very difficult.

It has been reported^[5] that how well the rise in tyre temperature correlates with the temperature rise in the constant stress flexometer test in comparison with the result from the method in ISO 4666-3.

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Rubber, vulcanized — Determination of temperature rise and resistance to fatigue in flexometer testing —

Part 4: Constant-stress flexometer

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 constant-stress flexometer test for the determination of the temperature rise and resistance to fatigue of vulcanized rubbers.

Many rubber products, such as tyres and belts, are tested by subjecting them to an oscillating load with a constant peak stress amplitude. In order to obtain good correlation between accelerated tests and in-service exposure of these products, this document gives instructions for carrying out measurements under such conditions.

This method is not applicable for rubber having a hardness greater than 85 IRHD.

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 4664-1, *Rubber, vulcanized or thermoplastic — Determination of dynamic properties — Part 1: General guidance*

ISO 4666-1, *Rubber, vulcanized — Determination of temperature rise and resistance to fatigue in flexometer testing — Part 1: Basic principles*

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

For the purposes of this document, the terms and definitions given in ISO 4664-1 and ISO 4666-1 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/>

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