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

**Part 3:
Compression flexometer
(constant-strain type)**

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

Partie 3: Flexomètre à compression (type à déformation constante)



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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 4666-3 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replaces the first edition (ISO 4666-3:1982), which has been revised to update the normative references (ISO 4648 has been replaced by ISO 23529). In addition, the layout of Clause 11, the test report, has been updated. The text has also been clarified in places. A precision statement and calibration schedule are added as annexes. Finally, the title has been changed to make a clear distinction from ISO 4666-4 (constant-stress flexometer).

ISO 4666 consists of the following parts, under the general title *Rubber, vulcanized — Determination of temperature rise and resistance to fatigue in flexometer testing*:

- *Part 1: Basic principles*
- *Part 2: Rotary flexometer*
- *Part 3: Compression flexometer (constant-strain type)*
- *Part 4: Constant-stress flexometer*

Introduction

One major consequence of the internal heat generation of rubber under a flexing compression is the development of an elevated temperature in the rubber. This International Standard provides for the measurement of the temperature rise.

Under particularly severe heat generation and temperature rise conditions, internal rupture of the test piece may occur with fatigue failure. Provision is also made for the measurement of resistance to this type of fatigue.

The test is conducted under conditions of a selected static pre-stress or compression and a selected cyclic strain of constant maximum amplitude imposed upon the pre-stressed test piece.

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

Part 3:

Compression flexometer (constant-strain type)

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 may 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 part of ISO 4666 specifies the flexometer test with constant-strain amplitude for the determination of the temperature rise and resistance to fatigue of vulcanized rubber. The flexometer specified is known as the Goodrich flexometer, but any other apparatus giving equivalent performance can be used.

This part of ISO 4666 gives directions for carrying out measurements which make possible predictions regarding the durability of rubbers in finished articles subject to dynamic flexing in service such as tyres, bearings, supports, V-belts, and cable-pulley insert rings. However, owing to the wide variations in service conditions, no simple correlation between the accelerated tests described in the various parts of this International Standard and service performance can be assumed.

The method is not recommended for rubber having a hardness greater than 85 IRHD.

2 Normative references

The following referenced documents are indispensable for the application 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, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)*

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

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

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