
**Rubber, vulcanized or
thermoplastic — Determination of
tensile stress-strain properties**

*Caoutchouc vulcanisé ou thermoplastique — Détermination des
caractéristiques de contrainte-déformation en traction*

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Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	4
5 General	4
6 Test pieces	4
6.1 General.....	4
6.2 Dumb-bells.....	5
6.3 Rings.....	5
7 Apparatus	6
7.1 Dies and cutters.....	6
7.2 Thickness gauge.....	6
7.3 Cone gauge.....	6
7.4 Tensile-testing machine.....	7
7.5 Test rig for ring test pieces.....	8
8 Number of test pieces	9
9 Preparation of test pieces	9
9.1 Dumb-bells.....	9
9.2 Rings.....	9
10 Conditioning of sample and test pieces	9
10.1 Time between vulcanization and testing.....	9
10.2 Protection of samples and test pieces.....	10
10.3 Conditioning of samples.....	10
10.4 Conditioning of test pieces.....	10
11 Marking of dumb-bell test pieces	10
12 Measurement of test pieces	10
12.1 Dumb-bells.....	10
12.2 Rings.....	11
12.3 Comparison of groups of test pieces.....	11
13 Procedure	11
13.1 Dumb-bell test pieces.....	11
13.2 Ring test pieces.....	11
14 Temperature of test	12
15 Calculation of results	12
15.1 Dumb-bells.....	12
15.2 Ring test pieces.....	13
16 Expression of results	14
17 Precision	14
18 Test report	15
Annex A (informative) Preparation of type B ring test pieces	16
Annex B (informative) Precision	19
Annex C (informative) Analysis of ITP data and dumb-bell shape	26
Bibliography	30

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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on 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: 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 sixth edition cancels and replaces the fifth edition (ISO 37:2011), which has been technically revised.

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

- the cutter angle range in [Figure 3](#) has been changed to 30° - 35°;
- dimension B of the dumb-bell test piece has been corrected in [Figure 3](#);
- accuracy requirement for force measurement has been changed to Class 1;
- dimensions of $\varnothing d_1$ and $\varnothing d_2$ in [Figure 5](#) and [Table 3](#) have been corrected;
- the test results of interlaboratory test programmes (ITP) have been added.

Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties

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 method for the determination of the tensile stress-strain properties of vulcanized and thermoplastic rubbers.

The properties which can be determined are tensile strength, elongation at break, stress at a given elongation, elongation at a given stress, stress at yield and elongation at yield. The measurement of stress and strain at yield applies only to some thermoplastic rubbers and certain other compounds.

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 5893, *Rubber and plastics test equipment — Tensile, flexural and compression types (constant rate of traverse) — Specification*

<https://standards.iteh.ai/catalog/standards/iso/6a945c64-8670-4205-98c7-6db5bd780201/iso-37-2017>

ISO 23529:2016, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at <http://www.electropedia.org/>

— ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

tensile stress

S

stress applied so as to extend the test piece

Note 1 to entry: It is calculated as the applied force per unit area of the original cross-section of the test length.

3.2

elongation

E

tensile strain, expressed as a percentage of the test length, produced in the test piece by a *tensile stress* (3.1)