INTERNATIONAL STANDARD

ISO 37

Fourth edition
2005-07-15

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

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

Reference number
ISO 37:2005(E)

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Published in Switzerland

Contents

Page

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 37 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 37:1994).

The major changes incorporated in this revision are as follows:

— The addition of a new dumb-bell test piece designated type 1A.

— The addition of a new annex, Annex B, with precision data on type 1, type 2 and type 1A test pieces.

— The addition of a new annex, Annex C, with an analysis of the dependence of the precision data on dumb-bell test piece shape.

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

1 Scope

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

ISO 23529:2004, *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.

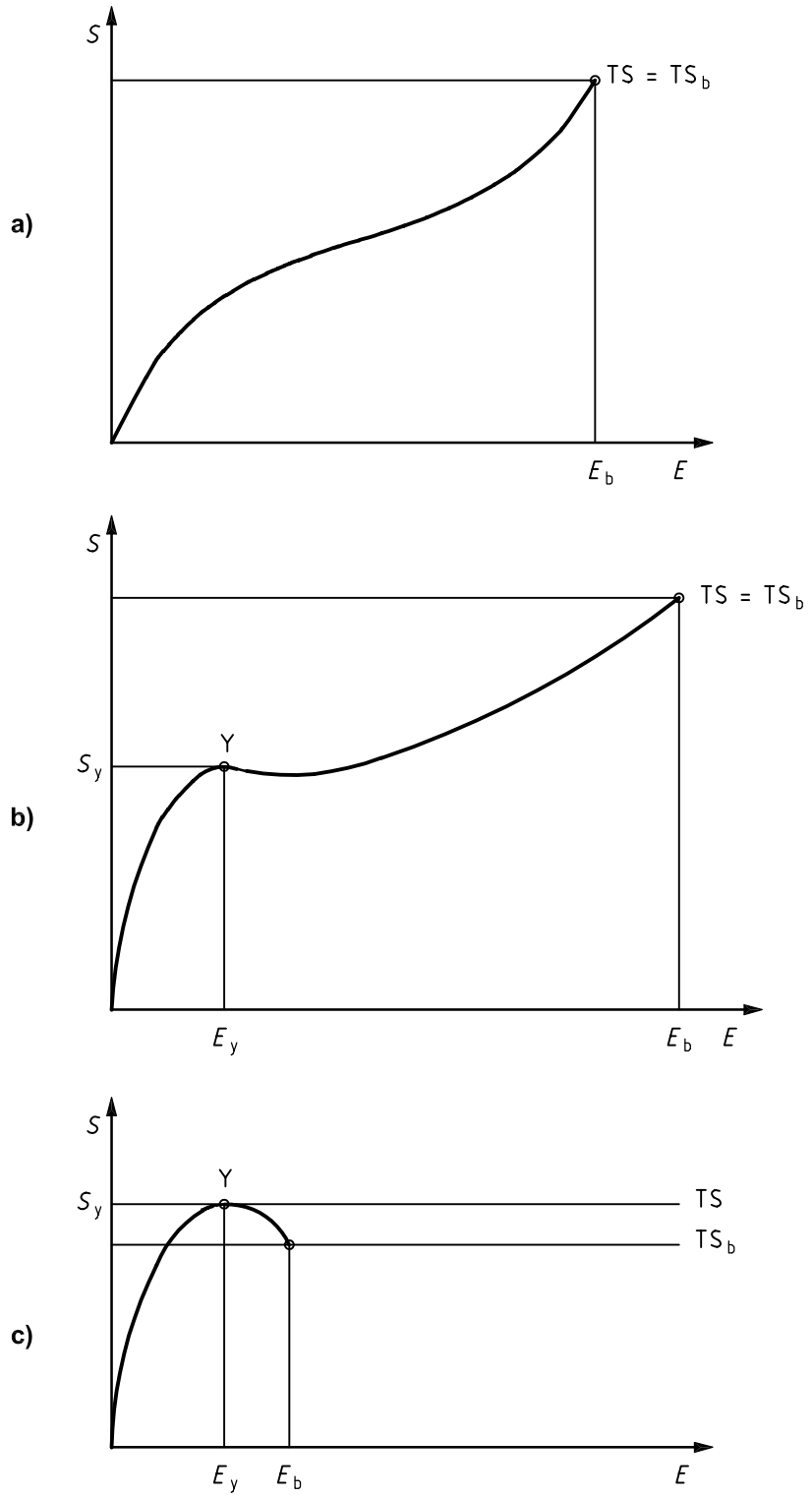
3.1
tensile stress
S
stress applied so as to extend the test piece

NOTE 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

3.3
tensile strength
TS
maximum tensile stress recorded in extending the test piece to breaking point

NOTE See Figures 1a) to 1c).



Key

E	elongation	S_y	stress at yield
E_b	elongation at break	TS	tensile strength
E_y	elongation at yield	TS_b	tensile strength at break
S	stress	Y	yield point

Figure 1 — Illustration of tensile terms

ISO 37:2005 Rubber, vulcanized or thermoplastic - Determination of tensile stress-strain properties