



International
Standard

ISO 13118

**Textile — Biaxial tensile properties
of woven fabric — Determination
of elasticity properties using a
cruciform test piece**

*Textiles — Propriétés biaxiales des tissus — Détermination des
propriétés d'élasticité au moyen d'éprouvette cruciforme*

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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 document 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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This document was prepared by Technical Committee ISO/TC 38, *Textiles*, Subcommittee SC 24, *Conditioning atmospheres and physical tests for textile fabrics*.

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.

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Textile — Biaxial tensile properties of woven fabric — Determination of elasticity properties using a cruciform test piece

1 Scope

This document specifies a test method for determination of the elasticity and related properties of woven textile fabrics, using biaxial stress states, which exhibit stretch characteristics imparted by the presence of an elastomeric fibre, mechanical, or chemical treatment.

This biaxial elasticity test is restricted to the use of constant rate of extension (CRE) testing machine.

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 139, *Textiles — Standard atmospheres for conditioning and testing*

ISO 7500-1, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses: 2024

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

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

3.1

biaxial elasticity test

method for measuring the stress-strain curves of test specimens subject to biaxial tension using a cruciform test piece

3.2

CRE biaxial tensile testing machine

testing machine for applying biaxial tensile stress with a constant speed to a test specimen in the orthogonal directions parallel to the arms of the cruciform test piece

3.3

grip separation length

distance between the two gripping points of the testing device

3.4

gauge length

distance between the two effective gauge mark points of the test specimen in each direction

3.5

gauge mark

marks on the test specimen surface for measuring the extension using optical extensometer

3.6

initial length

length of the test specimen between the two effective gauge mark point under specified pretension, at the beginning of the test

3.7

pretension

force applied to a test specimen at the beginning of certain tests

Note 1 to entry: Pretension is used to determine the initial length of the test specimen.

[SOURCE: ISO 20932-1:2018, 3.9]

3.8

extension

increase in gauge length of a test specimen produced by a force as a result of testing

Note 1 to entry: Extension is expressed in unit of the length.

3.9

elongation

ratio of the extension of the test specimen to its initial length

Note 1 to entry: Elongation is expressed as a percentage.

[SOURCE: ISO 20932-1:2018, 3.11]

3.10

maximum force

force at the position at the maximum extension on the final cycle

Note 1 to entry: Maximum force is expressed in newtons.

3.11

maximum extension

extension recorded in millimetres at the maximum force on the final cycle

Note 1 to entry: See [Annex A](#).

Note 2 to entry: Maximum extension is expressed in unit of the length.

3.12

force decay due to time

loss of force measured over time when a test specimen is stretched to a specified elongation or force and held at this position for a given time period

Note 1 to entry: The decay in force is expressed as a percentage of the original force recorded at the specified position.

Note 2 to entry: See [Annex A](#).

[SOURCE: ISO 20932-1:2018, 3.16]

3.13

force decay due to exercising

loss of force, calculated and expressed as a percentage, as measured and recorded at the same elongation point on two different cycles when the test specimen is cycled several times between the gauge length and a specified elongation

Note 1 to entry: See [Annex A](#).