INTERNATIONAL STANDARD

ISO 24281

First edition
2021-07

Textiles — Biaxial tensile properties of woven fabric — Determination of maximum force and elongation at maximum force using the grab method

Textile- Propriétés biaxiales des tissus- Détermination de la force maximale et de l'élongation par la méthode d'arrachement

Reference number
ISO 24281:2021(E)

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Published in Switzerland

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Foreword

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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).

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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 www.iso.org/iso/foreword.html.

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.

Textiles — Biaxial tensile properties of woven fabric — Determination of maximum force and elongation at maximum force using the grab method

1 Scope

This document specifies a procedure to determine the maximum force and elongation at maximum force of textiles woven fabrics using a grab method in the biaxial testing machine.

The method is mainly applicable to woven textile fabrics, including fabrics which exhibit stretch characteristics imparted by the presence of an elastomeric fibre, mechanical, or chemical treatment. It can be applicable to fabrics produced by other techniques. It is not applicable to geotextiles[4], nonwovens[3], coated fabrics[5], textile-glass woven fabrics[2], and fabrics made from carbon fibres or polyolefin tape yarns.

The method is restricted to the use of constant rate of extension (CRE) testing machines to the same axis.

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*

ISO 10012, *Measurement management systems — Requirements for measurement processes and measuring equipment*

ISO 13934-1, *Textiles — Tensile properties of fabrics — Part 1: Determination of maximum force and elongation at maximum force using the strip method*

ISO 13934-2, *Textiles — Tensile properties of fabrics — Part 2: Determination of maximum force using the grab method*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13934-1, ISO 13934-2 and the following apply.

ISO and IEC maintain terminology 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/

3.1
biaxial
related to measurement or application along two axes simultaneously

3.2
constant-rate-of-extension (CRE) biaxial testing machine
tensile-testing machine provided with four clamp moves independently with a constant speed throughout the test, the entire testing system being virtually free from deflection

3.3
grab test
tensile test in which only the centre part of the test specimen is gripped in the jaws of the testing machine

[SOURCE: ISO 13934-2:2014, 3.2]

3.4
maximum force
maximum force recorded when a test specimen is taken to rupture during a test under the specified conditions

[SOURCE: ISO 13934-1:2013, 3.11]

3.5
gauge length
distance between the two effective clamping points of a testing device

Note 1 to entry: the effective clamping points (or lines) of jaws can be checked by clamping e test specimen under defined pretension with carbon copy paper to produce a gripping pattern on the test specimen and/or the jaw faces.

[SOURCE: ISO 13934-1:2013, 3.3]

3.6
extension
increase in length of a test specimen produced by a force

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

[SOURCE: ISO 13934-1:2013, 3.6]

3.7
elongation
ratio of the *extension* (3.6) of the test specimen to its initial length

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

[SOURCE: ISO 13934-1:2013, 3.7]

3.8
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* (3.9) of the test specimen.

[SOURCE: ISO 13934-1:2013, 3.5]

3.9
initial length
length of a test specimen under specified *pretension* (3.8) between the two effective clamping points at the beginning of certain tests

Note 1 to entry: See also 3.5.

[SOURCE: ISO 13934-1:2013, 3.4]