भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDRADS

Draft for comments only Doc: TXD 01 (24993) WC
March 2024

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भारतीय मानक मसौदा

वस्त्रादि – बुने हुए कपड़े का द्विअक्षीय तन्यता गुणधर्म – ग्रैब विधि का प्रयोग कर अधिकतम बल एवं अधिकतम बल पर दीर्घीकरण ज्ञात करना

(Draft Indian Standard)

TEXTILES — BIAXIAL TENSILE PROPERTIES OF WOVEN FABRIC — DETERMINATION OF MAXIMUM FORCE AND ELONGATION AT MAXIMUM FORCE USING THE GRAB METHOD

ICS 59.080.30

Physical Methods of Test Sectional Committee	Last date for receipt of comments
TXD 01	03rd May 2024

NATIONAL FOREWORD

(*Formal clauses will be added later)*

This Indian Standard intended to be adopted is identical with ISO 24281 : 2021 'Textiles — Biaxial tensile properties of woven fabric — determination of maximum force and elongation at maximum force using the grab method' issued by the International Organization for Standardization (ISO).

Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In the standard intended to be adopted, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their respective places are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 139, Textiles — Standard atmospheres for conditioning and testing	IS 6359 : 2023 Method for conditioning of textiles	Technically Equivalent
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	IS 1828 (Part 1) : 2022 Metallic materials - Verification of static uniaxial testing machines: Part 1 tension/compression testing machines - Verification and calibration of the force - Measuring system (Fourth Revision)	Identical to ISO 7500-1 : 2004
ISO 10012, Measurement management systems — Requirements for measurement processes and measuring equipment	IS/ISO 10012 : 2003 Measurement management systems - Requirements for measurement processes and measuring equipment (First Revision)	Identical to ISO 10012 : 2003
ISO 13934-1, Textiles — Tensile properties of fabrics — Part 1: Determination of maximum force and elongation at maximum force using the strip method	IS 1969 (Part 1) : 2018 Textiles – Tensile properties of fabrics – Part 1 Determination of maximum force and elongation at maximum force using the strip method (fourth revision)	Identical to ISO 13934-1 : 2013
ISO 13934-2, Textiles — Tensile properties of fabrics — Part 2: Determination of	IS 1969 (Part 2) : 2018 Textiles – Tensile properties of fabrics – Part 2 Determination of maximum	Identical to ISO 13934-2: 2013

maximum force using the grab method	force using the grab method (fourth revision)	

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 2022 'Rules for rounding off numerical values (second revision)'.

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, nonwovens, coated fabrics, textile glass woven fabrics, 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 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:

a) ISO Online browsing platform: available at https://www.iso.org/obp
b) IEC Electropedia: available at https://www.electropedia.org/

2.1 Biaxial

Related to measurement or application along two axes simultaneously

2.2 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.

2.3 Grab Test

Tensile test in which only the centre part of the test specimen is gripped in the jaws of the testing machine.

2.4 Maximum Force

Maximum force recorded when a test specimen is taken to rupture during a test under the specified conditions.

2.5 Gauge Length

Distance between the two effective clamping points of a testing device.

NOTE — 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.

2.6 Extension

Increase in length of a test specimen produced by a force.

NOTE — Extension is expressed in units of length.

2.7 Elongation

Ratio of the extension (2.6) of the test specimen to its initial length.

NOTE — Elongation is expressed as a percentage.

2.8 Pretension

Force applied to a test specimen at the beginning of certain tests.

NOTE — Pretension is used to determine the initial length (2.9) of the test specimen.

2.9 Initial Length

Length of a test specimen under specified pretension (2.8) between the two effective clamping points at the beginning of certain tests

NOTE — See also 2.5.

2.10 Elongation at Maximum Force

Elongation (2.7) of a test specimen produced by the maximum force.

NOTE — See Figure 1.

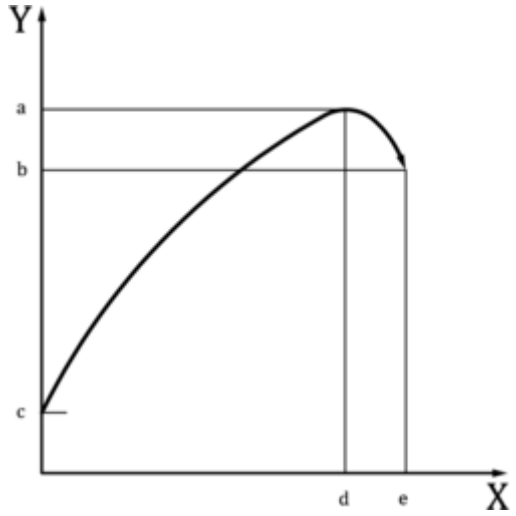

FIG. 1 EXAMPLE OF FORCE – ELONGATION CURVE

Key

X Elongation

Y Force

a Maximum Force

b Force at rupture

c Pretension

d Elongation at Maximum Force

e Elongation at rupture

FORMAT FOR SENDING COMMENTS ON BIS DOCUMENTS

(Please use A4 size sheet of paper only and type within fields indicated. Comments on each clause/sub clause/table/fig etc. be started on a fresh box. Information in column 3 should include reasons for the comments and suggestions for modified working of the clauses when the existing text is found not acceptable. Adherence to this format facilitates Secretariat's work)

Please e-mail your comments to txd@bis.gov.in

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Item, Clause Sub-Clause No. Commented Upon (Use Separate Box a fresh)	**Comments**	**Specific Proposal (Draft) Clause to be add/ amended**	**Remarks**	**Technical References and Justification on Which (2), (3), (4) are based**
(1)	**(2)**	**(3)**	**(4)**	**(5)**