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Tekstilije - Natezne lastnosti ploskovnih tekstilij - 2.del: Ugotavljanje pretržne sile in pretržnega raztezka po Grabovi metodi (ISO 13934-2:1999)

Textiles - Tensile properties of fabrics - Part 2: Determination of maximum force using the grab method (ISO 13934-2:1999)

Textilien - Zugeigenschaften von textilen Flächengebilden - Teil 2: Bestimmung der Höchstzugkraft mit dem Grab-Zugversuch (ISO 13934-2:1999)

Textiles - Propriétés des étoffes en traction - Partie 2: Détermination de la force maximale par la méthode d'arrachement (Grab test) (ISO 13934-2:1999)

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Textiles - Tensile properties of fabrics - Part 2: Determination of maximum force using the grab method (ISO 13934-2:1999)

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This European Standard was approved by CEN on 21 November 1998.

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Foreword

The text of EN ISO 13934-2:1999 has been prepared by Technical Committee CEN/TC 248 "Textiles and textile products", the secretariat of which is held by BSI, in collaboration with Technical Committee ISO/TC 38 "Textiles".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 1999, and conflicting national standards shall be withdrawn at the latest by August 1999.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This part of EN ISO 13934 has been prepared in the context of several test methods for determination of certain mechanical properties of textiles using mainly tensile testing machines, e.g. tensile properties, seam tensile properties, tear properties, seam slippage. The procedures for these International Standards agree where appropriate. The results obtained by one of the methods should not be compared with those obtained by the other methods. See annex D for informative references.

This edition cancels and replaces ISO 5082:1982.

EN ISO 13934 consists of the following parts, under the general title Textiles - Tensile properties of fabrics:

- Part 1: Determination of maximum force and elongation at maximum force using the strip method

- Part 2: Determination of maximum force using the grab method

Annexes A, B, C and D of this part of EN ISO 13934 are for information only.

1 Scope

This part of EN ISO 13934 specifies a procedure for the determination of maximum force of textile fabrics known as the grab test.

Note : Part 1 of EN ISO 13934 describes the method known as the strip test. For informative references see annex D.

The method is mainly applicable to woven textile fabrics. It may be applicable to fabrics produced by other techniques. It is not normally applicable to woven elastic fabrics, geotextiles, nonwovens, coated fabrics, textile-glass woven fabrics and fabrics made from carbon fibres or polyolefin tape yarns (see annex D).

The method specifies the determination of the maximum force of test specimens in equilibrium with the standard atmosphere for testing and of test specimens in the wet state.

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

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

EN 20139	Textiles - Standard atmospheres for conditioning and testing (ISO 139:1973)
ISO 3696	Water for analytical laboratory use - Specification and test methods
EN 10002-2	Metallic materials - Tensile testing - Part 2: Verification of the force measuring system of the tensile testing machines
EN 30012-1	Quality assurance requirements for measuring equipment - Part 1: Metrological confirmation system for measuring equipment (ISO 10012-1:1992)

3 Definitions

For the purposes of this part of EN ISO 13934 the following definitions apply:

3.1 Constant-rate-of-extension (CRE) testing machine

Tensile-testing machine provided with one clamp which is stationary and another clamp which moves with a constant speed throughout the test, the entire testing system being virtually free from deflection (EN ISO 13934-1).

3.2 Grab test

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

3.3 Maximum force

The maximum force recorded when a test specimen is taken to rupture during a test under the specified conditions
(EN ISO 13934-1).

3.4 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 a test specimen under specified pretension with carbon copy paper to produce a gripping pattern on the test specimen and/or the jaw faces (EN ISO 13934-1).

4 Principle

A fabric test specimen is gripped in its centre part by jaws of specified dimensions is extended at constant rate until it ruptures. The maximum force is recorded.

5 Sampling

Select samples either in accordance with the procedure laid down in the material specification for the fabric, or as agreed between the interested parties.

In the absence of an appropriate material specification the example of a suitable sampling procedure given in annex A may be used.

An example of a suitable pattern for cutting test specimens from the laboratory sample is given in annex B. Avoid test specimens with folded or creased areas, selvedges and areas not representative of the fabric.

6 Apparatus

6.1 CRE machine.

Metrological confirmation system of the tensile-testing machine shall be in accordance with EN 30012-1.

The constant-rate-of-extension (CRE) machine shall have the general characteristics given in 6.1.1 to 6.1.6.

6.1.1 The tensile-testing machine shall be provided with means for indicating or recording the force applied to the test specimen in stretching it to rupture. Under conditions of use, the accuracy of the apparatus shall be class 1 of EN 10002-2. The error of the indicated or recorded maximum force at any point in the range in which the machine is used shall not exceed ± 1 %.

6.1.2 If a class 2 tensile-testing machine according to EN 10002-2 is to be used, this shall be stated in the test report.

6.1.3 If recording of force is obtained by means of data acquisition boards and software, the frequency of data collection shall be at least eight per second.

6.1.4 The machine shall be capable of constant rate of extension of 50 mm/min, with an accuracy of ± 10 %.

6.1.5 The machine shall be capable of setting the gauge length to 100 mm or, if agreed, to 75 mm, to within ± 1 mm.

6.1.6 The clamping device of the machine shall be positioned with the central point of the two jaws in the line of applied force, the front edges shall be at right angles to the line of applied force and their clamping faces shall be in the same plane.

The jaws shall be capable of holding the test specimen without allowing it to slip and designed so that they do not cut or otherwise weaken the test specimen.

The faces of the jaws shall be smooth and flat, except that when, even with packing, the test specimen cannot be held satisfactorily with flat-faced jaws, engraved or corrugated jaws can be used to prevent slippage. Other auxiliary materials for use with either smooth or corrugated jaws to improve specimen gripping include paper, leather, plastics or rubber.

For the grab test the dimensional clamping area of the fabric shall be (25 mm ± 1 mm) x (25 mm ± 1 mm). This area can be achieved by either method a) or method b) described below and illustrated in annex C.

a) One clamp (25 mm) x (40 mm min., preferably 50 mm), positioned with the wider direction of the clamp perpendicular to the line of application of the force; a second clamp of the same dimensions positioned perpendicular to the first so that the wider direction of the clamp is parallel to the direction of application of the force.

b) One clamp (25 mm) x (40 mm min., preferably 50 mm), positioned with the wider direction of the clamp perpendicular to the line of application of the force; a second clamp 25 mm x 25 mm.

6.2 Equipment for cutting test specimens.

6.3 Equipment in which test specimens can be immersed in water preparatory to wet testing.

6.4 Grade 3 water in accordance with ISO 3696 for wetting test specimens.

6.5 Nonionic wetting agent.