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**Gumirane ali plastificirane tekstilije - Ugotavljanje sile šivov proti trganju (z iglo) - Preskusna metoda**

Rubber or plastics-coated fabrics - Determination of stitch tear force (with needle) - Test method

Mit Kautschuk oder Kunststoff beschichtete Textilien - Bestimmung der Stich-Reißkraft (mit Nadel) - Prüfverfahren

Supports textiles revêtus de caoutchouc ou de plastique - Détermination de la résistance au déchirement au point de couture (à l'aide d'une aiguille) - Méthode d'essai

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**Ta slovenski standard je istoveten z: EN 16653:2015**

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**ICS:**

59.080.40

Površinsko prevlečene  
tekstilije

Coated fabrics

**SIST EN 16653:2015****en,fr,de**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 16653**

March 2015

ICS 59.080.40

English Version

**Rubber or plastics-coated fabrics - Determination of stitch tear  
resistance (using a needle) - Test method**

Supports textiles revêtus de caoutchouc ou de plastique -  
Détermination de la résistance au déchirement au point de  
couture (à l'aide d'une aiguille) - Méthode d'essai

Mit Kautschuk oder Kunststoff beschichtete Textilien -  
Bestimmung des Stichtausreißwiderstands (unter  
Verwendung einer Nadel) - Prüfverfahren

This European Standard was approved by CEN on 7 February 2015.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 16653:2015) has been prepared by Technical Committee CEN/TC 248 "Textiles and textile products", the secretariat of which is held by BSI.

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 September 2015 and conflicting national standards shall be withdrawn at the latest by September 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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## EN 16653:2015 (E)

## 1 Scope

This European Standard specifies a method for the determination of the resistance of the seams of rubber or plastic-coated fabrics against tearing out a needle perpendicular to the stitching direction. This resistance is characterized by determining the stitch tear force.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 2231, *Rubber- or plastics-coated fabrics — Standard atmospheres for conditioning and testing* (ISO 2231)

EN ISO 2286-3, *Rubber- or plastics-coated fabrics — Determination of roll characteristics — Part 3: Method for determination of thickness* (ISO 2286-3)

EN ISO 7500-1, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Verification and calibration of the force-measuring system* (ISO 7500-1)

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

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## 3 Terms and definitions

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

### 3.1

#### stitch tear resistance

resistance to pull a needle from a sample perpendicular to the stitching direction

### 3.2

#### stitch tear force

stitch tear resistance, recorded as the maximum tearing force

### 3.3

#### stitch tear strength

stitch tear force divided by the thickness

## 4 Test apparatus and materials

The following test apparatus and materials shall be used:

### 4.1 CRE machine.

Metrological confirmation system of the tensile-testing machine shall be in accordance with EN ISO 10012.

The constant-rate-of-extension (CRE) machine shall have the general characteristics given in 4.1.1 to 4.1.4.

**4.1.1** The tensile-testing machine shall be provided with means for indicating or recording the force applied to the test specimen. Under conditions of use, the accuracy of the apparatus shall be class 1 of EN ISO 7500-1. The error of the indicated or recorded maximum force at any point in the range in which the machine is used shall not exceed  $\pm 1\%$ .

**4.1.2** If a class 2 tensile-testing machine according to EN ISO 7500-1 is to be used, this shall be stated in the test report.

**4.1.3** 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.

**4.1.4** The machine shall be capable of constant rate of extension of  $(100 \pm 10)$  mm/min.

## **4.2 Needle.**

Either a smooth needle of stainless steel having a diameter of  $(1,0 \pm 0,1)$  mm and a conical tip or a corresponding piece of spring steel wire having the same diameter, also made of stainless steel and having a conical tip.

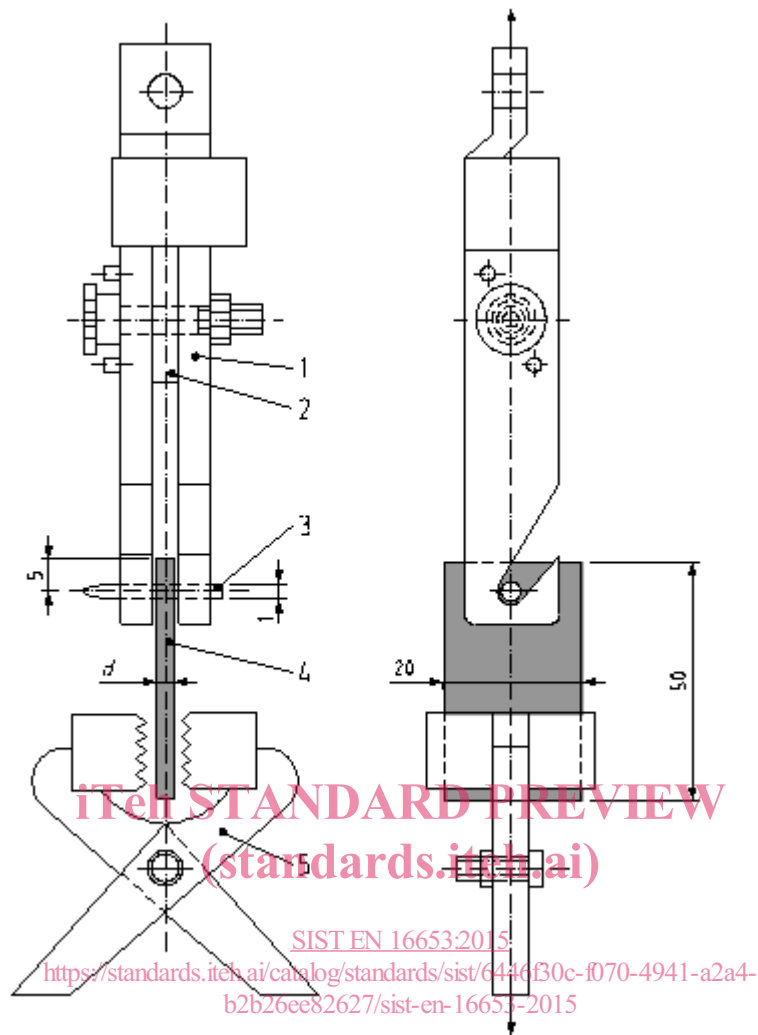
## **4.3 Clamping device.**

As an example, Figure 1 shows a schematic view of a clamping device. The bearing bushes for the needle shall be parallel and adjustable such that they can be set in accordance with the thickness of the test specimen. The clamping device shall be provided with a suitable safety device which prevents the needle from jumping out.

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#### Key

- 1 supporting bracket
- 2 spacer
- 3 steel needle
- 4 specimen
- 5 scissor clamp

**Figure 1 — Schematic view of a clamping device**

## 5 Sampling and conditioning

The test specimens to be tested are sampled in the warp and weft directions. For each direction, five test specimens shall be sampled. The test specimens consist of strips with a length of  $(50 \pm 1)$  mm and a width of  $(20 \pm 1)$  mm.

All test specimens shall be conditioned for at least 24 h prior to testing in accordance with EN ISO 2231.

The final result shall be based on test specimens of the same type only, and the type shall be indicated in the test report.



## 6 Test method

The test is carried out after conditioning in a standard atmosphere in accordance with EN ISO 2231.

The thickness of the test specimen shall be measured in accordance with EN ISO 2286-3.

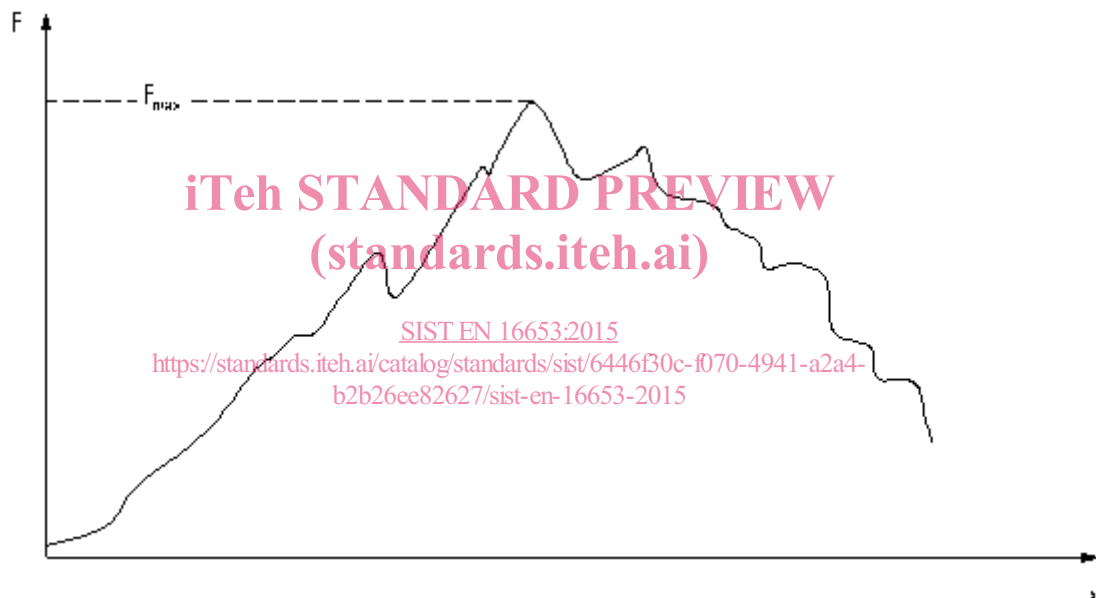
A needle having a diameter of 1 mm (see 4.2) is inserted into the test specimen 5 mm from the edge in the centre of the narrow side (see Figure 1), as perpendicularly as possible, by means of a template. Prior to this, the test specimen shall not have been pierced or punched in any manner.

The needle, which is now held (fixed) inside the test specimen, is placed into the clamping device (see 4.3). The distance between the spacers shall be adjusted such that they just barely touch the test specimen.

The lower end of the test specimen is clamped into the lower jaw (shown as a scissor clamp in Figure 1).

The test specimen is elongated at 100 mm/min.

Record the maximum force, in newtons, which occurs while the needle is being torn out (see Figure 2).



### Key

$X$	displacement in millimetres
$F$	force in newtons
$F_{\max}$	stitch tear force

**Figure 2 — Force displacement diagram for the needle**