



# SLOVENSKI STANDARD

## SIST EN 964-1:1999

01-marec-1999

---

### Geotekstilije in geotekstilijam sorodni izdelki - Ugotavljanje debeline pri predpisanih tlakih - 1. del: Enojne plasti

Geotextiles and geotextile-related products - Determination of thickness at specified pressures - Part 1: Single layers

Geotextilien und geotextilverwandte Produkte - Bestimmung der Dicke unter festgelegten Drücken - Teil 1: Einzellagen

Géotextiles et produits apparentés - Détermination de l'épaisseur a des pressions prescrites - Partie 1: Couches individuelles

<https://standards.iteh.ai/catalog/standards/sist/6717863d-7e47-419b-bd02-8da68835b2fc/sist-en-964-1-1999>

Ta slovenski standard je istoveten z: EN 964-1:1995

---

#### **ICS:**

59.080.70      Geotekstilije      Geotextiles

**SIST EN 964-1:1999**      en

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 964-1:1999

<https://standards.iteh.ai/catalog/standards/sist/6717863d-7e47-419b-bd02-8da68835b2fe/sist-en-964-1-1999>

EUROPEAN STANDARD

EN 964-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 1995

ICS 59.080.70

Descriptors: Textiles, geotextiles, tests, thickness measurements, test pressure

English version

**Geotextiles and geotextile-related products -  
Determination of thickness at specified pressures -  
Part 1: Single layers**

Géotextiles et produits apparentés - Geotextilien und geotextilverwandte Produkte -  
Détermination de l'épaisseur à des pressions prescrites - Partie 1: Couches individuelles - Bestimmung der Dicke unter festgelegten Drücken - Teil 1: Einzellagen

(standards.iteh.ai)

[SIST EN 964-1:1999](https://standards.iteh.ai/catalog/standards/sist/6717863d-7e47-419b-bd02-8da68835b2fe/sist-en-964-1-1999)

<https://standards.iteh.ai/catalog/standards/sist/6717863d-7e47-419b-bd02-8da68835b2fe/sist-en-964-1-1999>

This European Standard was approved by CEN on 1995-03-07. 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 Central Secretariat or to any CEN member.

The European Standards exist 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

## CEN

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

© 1995

All rights of reproduction and communication in any form and by any means reserved in all countries to CEN and its members.

Ref. No. EN 964-1:1995 E

## Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 189 "Geotextiles and geotextile-related products" of which the secretariat is held by IBN.

This document is based on ISO 9863.

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 1995, and conflicting national standards shall be withdrawn at the latest by September 1995.

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

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 964-1:1999

[https://standards.iteh.ai/catalog/standards/sist/6717863d-7e47-419b-](https://standards.iteh.ai/catalog/standards/sist/6717863d-7e47-419b-bd02-8da6883527e/sist-en-964-1-1999)

[bd02-8da6883527e/sist-en-964-1-1999](https://standards.iteh.ai/catalog/standards/sist/6717863d-7e47-419b-bd02-8da6883527e/sist-en-964-1-1999)



## 1 Scope

This part of EN 964 specifies a method for the determination of the thickness of geotextiles and geotextile-related products at specified pressures and defines the pressure at which the nominal thickness is determined. The method is applicable to all geotextiles and geotextile-related products.

NOTE : The thickness of geotextiles and geotextile-related products should normally be determined by measuring one layer of the product. When two or more layers are used on top of each other in a design, a test may be made in accordance with this European Standard with the agreed number of layers. When testing structured geotextiles or geotextile-related products care should be taken to ensure that the results are meaningful for the particular product.

The test results are intended for identification purposes and for use in technical data sheets and/or as part of other test methods, e.g. tests of hydraulic properties.

## iTeh STANDARD PREVIEW

## 2 Normative references (standards.iteh.ai)

This part of EN 964 incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ISO 554 : 1976	Standard atmospheres for conditioning and/or testing - Specifications
EN 963	Geotextiles and geotextile-related products - Sampling and preparation of test specimens

## 3 Definitions

For the purposes of this European Standard, the following definitions apply:

**3.1** thickness: distance between a reference plate on which the specimen rests and the contacting face of a parallel presser-foot applying a given pressure to the specimen.



**3.2** nominal thickness : the thickness determined when a pressure of  $(2 \pm 0,01)$  kPa is applied to the specimen.

## **4 Principle**

**4.1** The thickness of a geotextile or geotextile-related product is measured on an area of defined size within a larger area of the product.

**4.2** The result of the test is given as the mean and coefficient of variation obtained at each specified pressure.

## **5 Apparatus**

**5.1** Thickness tester, incorporating the following elements :

**5.1.1** Interchangeable presser-foot, having a circular, plane and smooth surface with an area of  $25 \text{ cm}^2 \pm 0,2 \text{ cm}^2$  for testing materials of uniform thickness. For the determination of the overall thickness of materials of non-uniform thickness or the thickness of other parts of such materials, the size of the presser-foot shall be agreed between the interested parties and indicated in the test report.

The presser-foot shall be capable of exerting pressures of 2 kPa, 20 kPa and 200 kPa within a tolerance of  $\pm 0,5 \%$  normal to the plane of the specimen.

**NOTE :** To assure that the presser-foot surface and the reference plate are parallel when determining the overall thickness of geotextiles of non-uniform thickness, the presser-foot shall be supported at at least three points evenly distributed over the presser-foot surface, which normally will require that a presser-foot with an area of more than  $25 \text{ cm}^2$  be used.

**5.1.2** Reference plate, with a plane surface of minimum dimensions greater than 1,75 times the diameter of the presser-foot surface for testing material of uniform thickness. When testing thinner areas in materials of non-uniform thickness, the reference plate can be as small as the area of the presser-foot, or an alternative supporting device of these dimensions can be used, to assure full contact with the lower surface of the specimen.

**5.1.3** The accuracy of the thickness measuring device shall be:

1% for products  $\geq 1$  mm in thickness and  
0,01 mm for products  $< 1$  mm in thickness.

**5.2** Means of measuring time having an accuracy of 0,1 s.

## 6 Specimens

6.1 Cut a number of specimens of minimum dimensions greater than 1,75 times the diameter of the presser-foot surface.

The number of specimens shall be not less than 10.

NOTE: If new specimens are used for testing at each pressure then not less than 30 specimens will be required.

6.2 Select and cut the specimens in accordance with EN 963.

6.3 Condition the specimens in accordance with ISO 554 for a period of 24 h unless it can be shown that the results are not affected by omitting this procedure.

## 7 Procedure

### 7.1 General

The thickness is determined by using the procedure A or B as specified in either 7.2 or 7.3 applying pressures of 2 kPa, 20 kPa and 200 kPa to an accuracy of 0,5 %.

When determining the thickness of a material of non-uniform thickness, e.g. a material in which strands or similar features are present the part of the material to be tested shall be agreed between the interested parties. The part tested shall be specified in the test report.

NOTE : Other values of pressure may be agreed. If a pressure of more than 200kPa is applied a new, conditioned specimen should be used for each test.

### 7.2 Procedure A (Loading each set of specimens).

NOTE : This procedure may be chosen when using an apparatus the construction of which requires much time and/or labour when changing the pressure.

7.2.1 Place a specimen between the clean surfaces of the reference plate and presser-foot specified in clause 5. Gently lower the presser-foot applying a pressure of  $(2 \pm 0,01)$  kPa to the specimen.

Select a time which ensures that no appreciable change in product thickness is indicated by the instrument during a lapse of a further 20 % of that time.

NOTE : The recommended time is  $(30 \pm 0,1)$  s

Release the pressure and remove the specimen.

**7.2.2** Repeat the procedure in 7.2.1 until at least 10 specimens have been tested.

**7.2.3** Repeat the procedure in 7.2.1 and 7.2.2 using the same specimens or a corresponding number of new specimens and applying a pressure of  $(20 \pm 0,1)$  kPa.

**7.2.4** Repeat the procedure in 7.2.1 and 7.2.2 using the same specimens or a corresponding number of new specimens and applying a pressure of  $(200 \pm 1)$  kPa.

**7.3** Procedure B (Incremental loading of individual specimens)

NOTE : This procedure may be used if agreed between the interested parties.

**7.3.1** Carry out the procedure in 7.2.1 but without removing the specimen.

**7.3.2** Gently lower the presser-foot applying a pressure of  $(20 \pm 0.1)$ kPa to the same specimen and note the gauge reading after a time as specified in 7.2.1 without removing the specimen.

**7.3.3** Repeat the procedure in 7.3.2 applying a pressure of  $(200 \pm 1)$  kPa. Remove the specimen.

**7.3.4** Repeat the procedures in 7.3.1 to 7.3.3 until at least 10 specimens have been tested.

[SIST EN 964-1:1999](https://standards.iteh.ai/catalog/standards/sist/6717863d-7e47-419b-bd02-8da68835b2fe/sist-en-964-1-1999)

<https://standards.iteh.ai/catalog/standards/sist/6717863d-7e47-419b-bd02-8da68835b2fe/sist-en-964-1-1999>

## **8 Expression of results**

Determine the average thickness of the specimens, and the coefficient of variation, for each pressure given in clause 7 and to the accuracy given in 5.1.3.

NOTE 1: Upon request, the result of each individual determination can be given.

NOTE 2: Upon request, a graphical plot of the mean value of the thickness against the applied pressure can be given. The x-axis (applied pressure) should be logarithmic. The y-axis (thickness) should be linear.