



SLOVENSKI STANDARD
SIST EN ISO 12958:1999

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Geotekstilije in geotekstilijam sorodni izdelki - Ugotavljanje kapacitete pretoka vode v ravnini (ISO 12958:1999)

Geotextiles and geotextile-related products - Determination of water flow capacity in their plane (ISO 12958:1999)

Geotextilien und geotextilverwandte Produkte - Bestimmung des Wasserarbleitvermögens in der Ebene (ISO 12958:1999)

Géotextiles et produits apparentés - Détermination de la capacité de débit dans leur plan (ISO 12958:1999)

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ICS:

59.080.70 Geotekstilije Geotextiles

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EUROPEAN STANDARD
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English version

Geotextiles and geotextile-related products - Determination of water flow capacity in their plane (ISO 12958:1999)

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This European Standard was approved by CEN on 29 November 1998.

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.

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 Central Secretariat has the same status as the official versions.

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

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

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Foreword

The text of EN ISO 12958:1999 has been prepared by Technical Committee CEN/TC 189 "Geotextiles and geotextile-related products", the secretariat of which is held by IBN, 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.

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STANDARD PREVIEW
SIST EN ISO 12958:1999
Geotextiles and geotextile-related products
Determination of the tensile strength and modulus
of geotextiles by the wide strip tensile test
Method A
1. Scope
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3. Terms and definitions
4. Test pieces
5. Test method
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7. Test report
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1 Scope

This European standard specifies a method for determining the constant-head water flow capacity within the plane of a geotextile or geotextile-related product.

NOTE : If the full water flow capacity characteristics of the geotextile or geotextile-related product have previously been established, then for control purposes it can be sufficient to determine the water flow capacity at two loads and both gradients.

NOTE 2: The compressibility of the product over time will substantially influence the in-plane water flow capacity. A test method for assessing compressive creep behaviour of geotextiles or geotextile-related products is described in ENV 1897.

The test report is judged in conjunction with the long-term compressive creep behaviour in order to assess the long-term flow capacity.

2 Normative references

This European Standard 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.

EN 963	Geotextiles and geotextile-related products - Sampling and preparation of test specimens
EN 964-1	Geotextiles and geotextile-related product - Determination of thickness at specified pressures : Part 1 : Single layers
ENV 1897	Geotextiles and geotextile-related products - Determination of the compressive creep properties
EN 30320	Geotextiles - Identification on site (ISO 10320 : 1991)
ISO 2854	Statistical interpretation of data - Techniques of estimation and tests relating to means and variances
ISO 5813	Water quality - Determination of dissolved oxygen - Iodometric method.

3 Definitions

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

3.1 normal compressive stress: Compressive stress components, (expressed in kilopascals) normal to the plane of the geotextile or geotextile-related product.

3.2 in-plane flow: Fluid flow within the geotextile or geotextile-related product and parallel to its plane.

3.3 in-plane water flow capacity: Volumetric flow rate of water per unit width of specimen at a defined gradient and load.

NOTE: The term transmissivity is related to laminar flow conditions only and equals the water flow capacity at a hydraulic gradient equal to unity. As non laminar flow may occur, the term water flow capacity is preferred.

3.4 hydraulic gradient: Ratio of the head loss in the geotextile or geotextile-related product specimen to the distance between the measuring points.

4 Principle

The flow of water within the plane of a geotextile or geotextile-related product is measured under varying normal compressive stresses, typical hydraulic gradients and defined contact surfaces.

5 Apparatus and materials

5.1 Constant-head in-plane water flow apparatus, satisfying the following requirements:

a) The apparatus shall be capable of maintaining a constant head loss at different water levels, at least those corresponding to hydraulic gradients of 0,1 and 1,0, while maintaining a water head at the point of discharge of not greater than 100 mm.

NOTE 1: If the water head exceeds 100 mm, the normal stress should be corrected for the excess.

b) The apparatus shall be capable of maintaining the proposed normal compressive stress on the specimen without deformation which would influence the test results.

c) A loading mechanism, capable of sustaining a constant normal compressive stress on the geotextile specimen of 20 kPa, 100 kPa and 200 kPa to an accuracy of $\pm 5\%$.

d) The surfaces contacting the specimen shall be closed-cell foam rubber whose properties satisfy the compression-deflection envelope, illustrated in figure 1, when tested in accordance with EN 964-1.

For specimens with a thickness up to 10 mm, a foam rubber with a nominal thickness of 10 mm shall be used on each face.

For specimens with a thickness between 10 mm and 25 mm, a foam rubber with a nominal thickness of 1 to 1,25 times the specimen thickness shall be used on each face.

For specimens with a thickness over 25 mm, the foam rubber on each face shall have a nominal thickness of 25 mm.

NOTE 2: Two layers of foam rubber may be combined to achieve the desired thickness.

The width of the foam shall be the same as that of the loading platen. The length of the foam should normally be the same as the loading platen. However, to avoid obstruction at both the inlet and outlet due to compression of the foam, it is recommended, where necessary, to reduce its length by 0,4 times its nominal thickness.

NOTE 3: When the geotextile-related products to be tested have been designed to perform their hydraulic functions against rigid boundaries, the foam rubber membranes should not be used, but should be replaced with the adequate boundary, e.g. stiff high density polyethylene liner or concrete panel. Products for such applications can be identified typically by the fact that they have no geotextile layers to prevent soil intrusion, and in fact are not placed directly against a soil boundary.

When foam rubber layers have not been used, the test report should include the specific boundary used.

e) The apparatus shall have a minimum width of 0,2 m and a minimum net hydraulic length of 0,3 m. It shall be capable of testing specimens up to a thickness of 50 mm. It shall also be capable of accepting a foam rubber with a thickness of 25 mm in contact with both faces of the material to be tested.

f) The apparatus shall be essentially leaktight. At the lowest normal compressive stress and the highest hydraulic gradient, when the platen or pressure membranes with the contact surfaces are seated in the unit without the test specimen, the leakage shall not exceed 0, 2 ml/s.

Some examples of apparatus are shown in figure 2.

NOTE 4: For determination of the hydraulic head loss, it is recommended to provide the apparatus in figures 2b and 2c with two manometers at a spacing of at least 0,3 m within the specimen.

For very low flows, the leakage shall not exceed 10% of the flow value.

5.2 Water

For water flow rate values up to 0,3 l/m.s, the water used shall be de-aerated or fed from a stilling tank. The water shall be at a temperature between 18°C and 22°C and should be equal to or above that of the ambient temperature of the testing laboratory. The water shall not be continuously recycled. The oxygen content shall not exceed 10 mg/kg, when measured at the point where the water enters the apparatus.

For water flow rates greater than 300 mls⁻¹m⁻¹, water from the mains supply may be used. The temperature shall be noted and all necessary measures shall be taken to avoid air inclusion in the tap water.

NOTE: As temperature correction relates only to laminar flow, it is advisable to work at temperatures as close as possible to 20°C to minimize inaccuracies associated with inappropriate correction factors, should the flow be non laminar.

The water shall be filtered if suspended solids are visible to the naked eye or if solids accumulate on or in the specimen thus inhibiting flow.

5.3 **Dissolved-oxygen meter**, or apparatus in accordance with ISO 5813.

5.4 **Stopwatch**, for measuring time to an accuracy of 0,1 s.

5.5 **Thermometer**, for measuring temperature to an accuracy of 0,2°C.

5.6 **Measuring vessel**, for determining volume of water to an accuracy of 10 ml.

Alternatively, when small flow rate measurements are taken, the mass of water shall be determined with a balance for determining the mass to an accuracy of 1%.

Where direct discharge measurements are taken, the flow gauge shall be calibrated to an accuracy of 5% of the reading.

5.7 **Measuring device to determine the applied head**, to an accuracy of 1 mm.

5.8 **Measuring device to determine the applied normal stress**, with an accuracy of 1%.

6 Specimens

6.1 Handling

The sample shall be handled as infrequently as possible and shall not be folded, in order to prevent disturbing its structure. Keep the sample in a flat position without any load.

6.2 Selection

Take specimens from the sample in accordance with EN 963.

6.3 Number and dimensions

Cut three test specimens from the sample with the length parallel to the machine direction, and three specimens with the length parallel to the cross-machine direction so that the specimens measure at least 0,3 m in the length, or flow, direction, and at least 0,2 m in the cross-machine direction. When the width of the product is less than 0,2 m, the full width of the product shall be tested, by modifying the apparatus.

For an apparatus with rigid platen loading (see figure 2a), the length of the specimen shall be equal to the length of the loading platen taking into account 5.1 d); for an apparatus with pressure-membrane loading (see figures 2b and 2c) the length of the specimen may exceed the loaded length.

For products without integrated flow to both sides of the core and that are to be used for single sided drainage, six specimens shall be taken to enable testing of each of the two sides after one of them has been sealed.

It is important that the specimen width is not undersized, i.e. it shows a good push-tight fit.

Where it is necessary to determine the results to within a given confidence interval of the mean, determine the number of test specimens in accordance with ISO 2854.