



BSI Standards Publication

**Geotextiles and geotextile-related products –
Determination of water permeability characteristics
normal to the plane, without load (ISO 11058:2019)**

National foreword

This British Standard is the UK implementation of EN ISO 11058:2019. It supersedes BS EN ISO 11058:2010, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/553, Geosynthetics.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2019

Published by BSI Standards Limited 2019

ISBN 978 0 580 93628 9

ICS 59.080.70

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 July 2019.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

English Version

**Geotextiles and geotextile-related products -
Determination of water permeability characteristics
normal to the plane, without load (ISO 11058:2019)**

Géotextiles et produits apparentés - Détermination des caractéristiques de perméabilité à l'eau normalement au plan, sans contrainte mécanique (ISO 11058:2019)

Geotextilien und geotextilverwandte Produkte - Bestimmung der Wasserdurchlässigkeit normal zur Ebene, ohne Auflast (ISO 11058:2019)

This European Standard was approved by CEN on 24 May 2019.

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.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

This document (EN ISO 11058:2019) has been prepared by Technical Committee ISO/TC 221 "Geosynthetics" in collaboration with Technical Committee CEN/TC 189 "Geosynthetics" the secretariat of which is held by NBN.

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 December 2019, and conflicting national standards shall be withdrawn at the latest by December 2019.

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

This document supersedes EN ISO 11058:2010.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 11058:2019 has been approved by CEN as EN ISO 11058:2019 without any modification.

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Test specimens	1
4.1 Handling.....	1
4.2 Selection.....	1
4.3 Number and dimensions.....	2
4.4 Specimen conditions.....	2
5 Constant head method	2
5.1 Principle.....	2
5.2 Apparatus.....	2
5.3 Procedure.....	3
5.4 Calculation and expression of results.....	4
6 Falling head method	4
6.1 Principle.....	4
6.2 Apparatus.....	5
6.3 Procedure.....	6
6.4 Calculation and expression of results.....	6
7 Test report	7
Annex A (informative) Determination of the correction factor, R_T, to a water temperature of 20 °C	11
Annex B (normative) Relationship between head loss and flow velocity	13
Annex C (informative) Individual velocity index values for a head loss of 50 mm	15
Annex D (informative) Experimental data and calculations	16

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 221, *Geosynthetics*.

This third edition cancels and replaces the second edition (ISO 11058:2010), which has been technically revised.

The main changes compared to the previous edition are as follows:

- editorial modifications;
- formula corrections.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Geotextiles and geotextile-related products — Determination of water permeability characteristics normal to the plane, without load

1 Scope

This document specifies two test methods for determining the water permeability characteristics of a single layer of geotextile or geotextile-related product normal to the plane:

- a) the constant head method; and
- b) the falling head method.

2 Normative references

The following referenced documents are referred to in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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*

ISO 9862, *Geosynthetics — Sampling and preparation of test specimens*

ISO 10320, *Geosynthetics — Identification on site*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

velocity index

v-index

velocity corresponding to a head loss of 50 mm across a specimen, expressed to the nearest ± 1 mm/s

4 Test specimens

4.1 Handling

The sample shall not be folded and shall be handled as infrequently as possible to avoid disturbance to its structure. The sample shall be kept in a flat position without any load.

4.2 Selection

Test specimens shall be taken from the sample in accordance with ISO 9862.

4.3 Number and dimensions

Five test specimens shall be cut from the sample, each of suitable dimensions for the water permeability apparatus to be used.

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

4.4 Specimen conditions

The specimens shall be clean, free from surface deposits and without visible damage or folding marks.

5 Constant head method

5.1 Principle

A single, unloaded layer of geotextile or geotextile-related product is subjected to a unidirectional flow of water normal to the plane under a range of constant heads.

5.2 Apparatus

5.2.1 Apparatus in which it is possible to observe the presence of air bubbles on the surface of the specimen, with an internal diameter of minimum 50 mm, conforming to the following requirements.

- a) The apparatus shall be capable of applying a maximum head loss of at least 70 mm and maintaining a constant head for the duration of each test with water on both sides of the specimen.

NOTE Some examples of apparatus are shown in [Figure 1](#).

- b) The mean internal diameter of the apparatus shall be known to an accuracy of at least 0,1 mm. The exposed diameter of the specimen shall be the same as the internal diameter of the apparatus. The diameter of the apparatus shall remain identical on both sides of the specimen over a length of at least twice its internal diameter [see [Figures 1 a\)](#) and [1 b\)](#)]. Abrupt changes in diameter shall be avoided.

Alternatively [see [Figure 1 c\)](#)], the outflow may discharge into a reservoir with a diameter of at least four times the exposed diameter of the specimen. In this case, the distance from the geotextile to the base of the reservoir shall be at least 1,5 times the exposed diameter of the specimen.

If the product shows an obvious pattern, this pattern shall be included at least three times along any diameter of the specimen.

- c) Where necessary, to avoid any visible deformation, a grid of 1 mm diameter wire and a mesh size of (10 ± 1) mm shall be placed downstream of the specimen to support it during the test.
- d) The head loss measured at any velocity when a test is performed without the test specimen, but including any specimen-supporting grid, shall be less than 1 mm.

5.2.2 Water supply, of the following quality and condition.

- a) The water shall be at a temperature of between 18 °C and 22 °C.

As the temperature correction (see [Annex A](#)) 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.

- b) Water shall not be fed into the apparatus directly from a main supply due to problems caused by the release of air bubbles, which can be entrapped in the structure of the specimen. The water