

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS

Draft For Comments Only

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भारतीय मानक मसौदा

भूवस्त्रादि और भूवस्त्रादि से संबंधित उत्पाद – अपने समधरातल में जल प्रवाह क्षमता का
निर्धारण

भाग 2: प्रदर्शन परीक्षण

(आई एस 17179 : 2019 का पहला पुनरीक्षण)

Draft Indian Standard

**Geotextiles and Geotextile-related Products — Determination of Water Flow Capacity
in their Plane**

Part 2: Performance Test

(*First Revision of IS 17179 : 2019*)

ICS : 59.080.70

Geosynthetics Sectional
Committee, TXD 30

Last date for receipt of comments is
16 October 2024

NATIONAL FOREWORD

(*Formal clauses will be added later*)

This Indian Standard intended to be adopted is identical with ISO 12958-2 : 2020 Geotextiles and geotextile-related products — Determination of water flow capacity in their plane — Part 2: Performance test' issued by the International Organization for Standardization (ISO).

The standard was originally published in 2019. The second revision of the standard has been undertaken to align it with the latest version of ISO 12958-2 : 2020.

Since, ISO 12958 has been published in two parts, this standard has also been published in two parts. Other part is as under:

Part 1 Index test

Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words ‘International Standard’ appear referring to this standard, they should be read as ‘Indian Standard’.
- b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In the standard intended to be adopted, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their respective places are listed below along with their degree of equivalence for the editions indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 9863-1 Geosynthetics — Determination of thickness at specified pressures Part 1: Single layers	IS 13162 (Part 3) : 2021 Geosynthetics — Determination of thickness at specified pressures Part 3 : Single layers	Identical with ISO 9863-1 : 2016
ISO 10318-1 Geosynthetics Part 1: Terms and definitions	IS 13321 (Part 1) : 2022 Geosynthetics — (Part 1) : Terms and definitions (<i>first revision</i>)	Identical with ISO 10318-1 : 2015
ISO 9862 Geosynthetics — Sampling and preparation of test specimens	IS 14706 : 1999 Geotextiles — Sampling and preparation of test specimens	Technically equivalent

The technical committee has reviewed the provisions of the following International Standards referred in this standard intended to be adopted and has decided that these are acceptable for use in conjunction with this standard:

<i>International Standard</i>	<i>Title</i>
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

In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’.

Extract of ISO 12958-2 : 2020 ‘Geotextiles and geotextile-related products — Determination of water flow capacity in their plane — Part 2: Performance test’

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*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 189, *Geosynthetics*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition of ISO 12958-2, together with ISO 12958-1, cancels and replaces ISO 12958:2010, which has been technically revised.

A list of all parts in the ISO 12958 series can be found on the ISO website.

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.

Introduction

The results obtained under this test procedure do not compare with those obtained under ISO 12958-1, even if some of the test conditions are similar.

Many geosynthetic products can creep under constant load, i.e. see their thickness diminish over time, which can influence their in-plane water flow capacity. Although a seating time typically greater than the one used in ISO 12958-1 is used, this test does not cover all creep-related issues for drainage geo-composites. Assessment of long-term flow capacity involves further considerations.

This procedure can be useful to assess the effect of geotextile intrusion into the drainage core on the transmissivity of a drainage product, using soil from a particular project as a stress-distribution layer in contact with the geotextile.

Other test methods can be more suitable for the characterization of particular drainage products, such as ISO 18325 for prefabricated vertical drains. It is the responsibility of the user to assess the limit of this test procedure and select the appropriate test method, test conditions or both that adequately reflect the particular needs for their project.

In this test method, the flow capacity of the product in a given direction is evaluated considering soil confinement, service load and service hydraulic gradient, as well as primary creep. However:

- — For some products and designs, ensuring the product performance may require controlling the flow capacity of the product in both directions, for example for products with discrete draining elements, where the flow capacity significantly depends on the direction of flow. For these situations, the test shall be performed in both directions.
- — Other field-related issues affect material long-term performance, such as secondary or tertiary creep, chemical or biological clogging, chemical resistance and durability, installation and backfilling. These issues are covered in separate standards and it is essential that they be considered while designing with geosynthetics.

1 Scope

This document specifies a method for determining the constant-head water flow capacity within the plane of a geotextile or geotextile-related product, using boundary materials and test conditions of interest. A standard series of test conditions are proposed, involving soil confinement, low hydraulic gradients, seating times and an array of normal loads.

2 Normative references

The following documents are referred to in the text 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 9863-1, *Geosynthetics — Determination of thickness at specified pressures — Part 1: Single layers*
- ISO 10318-1, *Geosynthetics — Part 1: Terms and definitions*

3 Terms and definitions

For the purposes of this document, terms and definitions in ISO 10318-1 and 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 normal compressive stress

Σ

Compressive stress normal to the plane of the geotextile or geotextile-related product, expressed in kilopascals [kPa]

3.2 in-plane flow

Q

Fluid flow within the geotextile or geotextile-related product and parallel to its plane, expressed in litres per second [l/s]

3.3 performance in-plane water flow capacity

$q_{p \text{ perf } (\sigma, i, t, b)}$

Volumetric flow rate of water per unit width of specimen at a defined normal compressive stress (σ), hydraulic gradient (i), seating time (t) and boundary conditions (b), expressed in litres per second per meter [(l/s)/m]

3.4 hydraulic gradient

i

Ratio of the head loss in the geotextile or geotextile-related product specimen to the distance between two measuring points within the geotextile or geotextile-related product

Note 1 to entry: ISO/TR 18228-4¹ provides information on the significance of the hydraulic gradient.

3.5 seating time

Period of time during which the product is maintained under constant compressive stress before a measurement is made, expressed in hours (h)

3.6 boundary conditions

B

Type of materials contacting the specimen on its external faces

Note 1 to entry: Materials may be soil or granular materials, concrete or rigid platen, or any material likely to be in contact with the geotextile or geotextile-related product.

3.7 geotextile intrusion

Effect of the external loads pushing the geotextile into the draining core of the geocomposite, reducing the flow area, on a geocomposite where a geotextile is combined with a draining core

FORMAT FOR SENDING COMMENTS ON BIS DOCUMENTS

(Please use A4 size sheet of paper only and type within fields indicated. Comments on each clause/sub clause/table/fig etc. be started on a fresh box. Information in column 3 should

include reasons for the comments and suggestions for modified working of the clauses when the existing text is found not acceptable. Adherence to this format facilitates Secretariat's work)

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Item, Clause Sub-Clause No. Commented upon (Use Separate Box afresh)	Comments	Specific Proposal (Draft clause to be add/amended)	Remarks	Technical References and justification on which (2), (3), (4) are based
(1)	(2)	(3)	(4)	(5)