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# Determination of long-term flow of geosynthetic drains

# National foreword

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# Foreword

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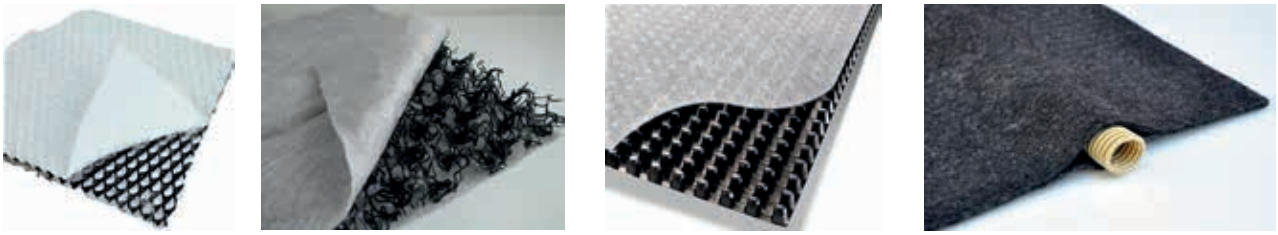
This document was prepared by Technical Committee ISO/TC 221, *Geosynthetics.*

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.


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# Introduction

The most commonly used drainage geosynthetics are the geocomposites which are produced by laminating one or two geotextiles, with a filter function, onto a drainage core. Examples are included in Figure 1.



**a) Geonet core** **b) Geomat core** **c) Cuspated core** **d) Perforated tube core**

**Figure 1 — Examples of drainage cores**

The components generally have the following characteristics under operating conditions:

— filtering component:

  — adequate permeability to gases and liquids in the direction perpendicular to the filter plane;

  — retention capacity of the soil particles;

— drainage core:

  — adequate permeability to gases and liquids in the direction planar to the drainage structure;

  — adequate compressive strength and creep resistance for the loads to be applied.

The geocomposites are often defined by the drainage cores: geomats (GMA), geonets (GNT), geospacers (GSP), multi-linear drains.

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# Determination of long-term flow of geosynthetic drains

## 1 Scope

This document specifies methods of deriving reduction factors for geosynthetic drainage materials to account for intrusion of filter geotextiles, compression creep, and chemical and biological degradation. It is intended to provide a link between the test data and the codes for design with geosynthetic drains.

The geosynthetics covered include those whose primary purpose is planar drainage, such as geonets, cuspated cores only, or cuspated cores combined with laminated filter geotextiles, and drainage liners, where the drainage core is made from polypropylene and high-density polyethylene. The majority of geosynthetic drains are geocomposites with geotextiles laminated to a drainage core and it is important, where possible, to consider the drainage behaviour of the geocomposite as a whole rather than the behaviour of the component parts in isolation.

This document does not cover the strength of overlaps or joints between geosynthetic drains nor whether these might be more or less durable than the basic material. It does not apply to geomembranes, for example, in landfills. It does not cover the effects of dynamic loading nor any change in mechanical properties due to soil temperatures below 0 °C, or the effects of frozen soil. This document does not cover uncertainty in the design of the drainage structures, nor the human or economic consequences of failure. Design guidance for geosynthetic drains is found in ISO/TR 18228-4.

## 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 10318-1, *Geosynthetics — Part 1: Terms and definitions*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10318-1 apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

## 4 Test equipment and procedures for determination of short-term in-plane water flow

### 4.1 Measurement of maximum hydraulic transmissivity and flow rate

The primary function of geosynthetic drains is to convey or transmit fluid within the flow direction(s) of a drainage layer. The discharge capacity can be given in terms of:

— Specific flow rate, which is the discharge per unit width in the geosynthetic drain, under a specified hydraulic gradient, as per Formula (1):

$$Q = q \ / \ B \tag{1}$$

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