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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 45366-2025

**Geosynthetics - Determination of water permeability
characteristics normal to the plane, under load
(English Translation)**

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is modified to adopt ISO 10776:2012 "Geotextiles and related products - Determination of vertical permeability under load".

Compared with ISO 10776:2012, this document has made the following structural adjustments.

--- Deleted 7.3~7.7 of ISO 10776:2012, and the subsequent article numbers were moved forward in sequence;

--- Added Appendix A.

The technical differences between this document and ISO 10776:2012 and their reasons are as follows.

--- Added the scope of application. "This document is applicable to all types of geosynthetics such as geotextiles. This document is not applicable to geosynthetics such as film-covered geosynthetics.

(see Chapter 1) to make the scope clearer;

--- The normative reference GB/T 4889 replaces ISO 2854 (see 5.3), and GB/T 7489 replaces ISO 5813 (see 6.3.1), GB/T 13760 replaces ISO 9862 (see 5.2), GB/T 14798 replaces ISO 10320 (see Chapter 9), Adapt to my country's technical conditions and increase operability;

--- Added normative reference document GB/T 13761.1 (see 8.4) to make the standard more standardized;

--- Added the terms and definitions of water permeability (see 3.2) to make the meaning of the terms clearer;

- Added the requirement that the sample diameter should not be less than 110 mm and the number of samples with high permeability (see 5.3) to increase the applicability of the standard and operability;
- Deleted the requirement of $\pm 2\text{mm}$ inner diameter of cylindrical device, and coordinated with the following "inner diameter tolerance $\pm 0.1\text{mm}$ " [see 6.1b)];
- Added the requirement that the thickness of the porous plate should not exceed 20 mm [see 6.1c)], and increased the accuracy of component dimensions;
- Changed the distance between the outer edges of adjacent holes on the lower surface of the upper porous plate in Figure 3 from 2.2mm to 2.4mm (see Figure 3) so that the standard More accurate;
- Changed the accuracy requirements of the measuring cylinder (see 6.3.4) to improve the accuracy of the standard;
- Changed the accuracy requirements of the water head measuring device (see 6.3.5) to improve the applicability of the standard;
- Changed the technical requirements for wetting agents (see 7.1) to improve the accuracy of the standard;
- Deleted the test steps of 7.3 to 7.7, such as applying 2kPa, 20kPa, and 200kPa pressure to measure the water flow rate when the sample is not installed, and changed to carry out empty sample measurement (see 7.3) to determine the head loss of the device itself, the operability of the standard has been improved;
- Added a 20°C water temperature correction factor in the flow rate calculation formula (see 8.1) to eliminate the influence of water viscosity on the test results;
- Added the calculation method of clear permeability coefficient and permeability (see 8.4, 8.5) to increase the operability of the standard.

The following editorial changes were made to this document.

- Change the name of the standard to "Determination of vertical permeability of geosynthetics under load";
- Added notes in 6.1c) and Figure 1;
- Added the informative appendix "Determination of the correction factor for water temperature 20°C";
- Added references.

1 Scope

This document describes a method for determining the vertical permeability of geosynthetics such as geotextiles under specified vertical compressive loads.

This document is applicable to all types of geosynthetics such as geotextiles.

This document is not applicable to film-covered geosynthetics.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 4889 Statistical processing and interpretation of data Estimation and test of mean and variance of normal distribution (GB/T 4889-2008, ISO 2854:1976, MOD) GB/T 7489 Water quality-Determination of dissolved oxygen-Iodometric method (GB/T 7489-1987, eqv/ISO 5813:1983) GB/T 13760 Sampling and specimen preparation of geosynthetics (GB/T 13760-2009, ISO 9862:2005, IDT) GB/T 13761.1 Determination of thickness of geosynthetics under specified pressure Part 1: Single-layer products (GB/T 13761.1-2022, ISO 9863-1:2016, MOD) GB/T 14798 Geosynthetics Field Identification Marking (GB/T 14798-2008, ISO 10320:1999, IDT)

3 Terms and definitions

The following terms and definitions apply to this document.

flow velocity

$v_{N50/\sigma}$

The velocity of water flowing vertically through the sample when the head difference is 50 mm under the action of vertical pressure sigma (2kPa, 20kPa, 200kPa).

Note: Flow rate is expressed in meters per second (m/s).

Permittivity

θ_{σ}

In laminar flow state, the water flow rate passing vertically through unit area of the product per unit time under unit head difference.

Note: Water permeability is expressed in s⁻¹.

[Source. GB/T 13759-2009, 2.3.3.5, modified]

4 Principle

The vertical pressure of 2kPa, 20kPa and 200kPa and the constant head difference are used to measure the vertical flow of water through geosynthetics such as geotextiles.