



BSI Standards Publication

**Geosynthetic barriers  
— Test method for the  
determination of the influence  
of wetting-drying cycles  
on the permeability of clay  
geosynthetic barriers**

**National foreword**

This Published Document is the UK implementation of CEN/TS 14417:2014. It supersedes DD CEN/TS 14417:2005 which is withdrawn.

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

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

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English Version

**Geosynthetic barriers - Test method for the determination of the influence of wetting-drying cycles on the permeability of clay geosynthetic barriers**

Géosynthétiques bentonitiques - Méthode d'essai pour la détermination de l'influence de cycles humidification/dessiccation sur la perméabilité des géosynthétiques bentonitiques

Geosynthetische Dichtungsbahnen - Prüfverfahren zur Bestimmung des Einflusses von Nass-Trocken-Zyklen auf die Wasserdurchlässigkeit von geosynthetischen Dichtungsbahnen

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## **Foreword**

This document (CEN/TS 14417:2014) has been prepared by Technical Committee CEN/TC 189 "Geosynthetics", the secretariat of which is held by NBN.

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## Introduction

This Technical Specification defines a method for testing the influence ratio of wetting-drying cycles on the flux through clay geosynthetic barriers. Such resistance is a requirement for many uses of these products.

The influence ratio is an indication of the behaviour of the product when exposed to repeated wetting and drying cycles in earth constructions. The flux of saturated clay geosynthetic barriers may increase after exposure to repeated wetting-drying cycles.

The Technical Specification does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and to comply with any regulations or legislation regardless of the wording in the technical specification.

The flux determined using this test method is not considered to be representative of the in-service flux of clay geosynthetic barriers. This test determines the influence of wetting-drying cycles in the absence of any other phenomenon, for example cation exchange.

## 1 Scope

This Technical Specification describes an index test to determine the influence ratio of wetting-drying cycles on the flux through saturated clay geosynthetic barrier specimens.

This test method is applicable to GBR-C products with no additional sealing layers attached.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 16416, *Geosynthetic clay barriers — Determination of water flux index — Flexible wall permeameter method at constant head*

EN ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696)*

EN ISO 10320, *Geotextiles and geotextile-related products — Identification on site (ISO 10320)*

ISO 554, *Standard atmospheres for conditioning and/or testing — Specifications*

## 3 Terms and definitions

For the purposes of this document, the following term and definition applies.

### 3.1

#### **influence ratio**

ratio of the flux of a specimen exposed to wetting-drying cycles to that of the flux through an unexposed reference specimen, expressed in percent

## 4 Principle

The flux through 100 mm diameter clay geosynthetic barrier (GBR-C) specimens is determined with a flexible wall permeameter both on a specimen exposed to wetting-drying cycles and on an unexposed reference specimen.

A specimen either square with an edge length not less than 200 mm or circular with a diameter not less than 200 mm to a tolerance of  $\pm 0,5\%$  is saturated under a pressure of  $(4 \pm 0,2)$  kPa for 48 h at constant room temperature. After saturation, the sample is dried under a pressure of  $(4 \pm 0,2)$  kPa in an oven at  $110\text{ }^\circ\text{C}$  for 24 h. After the drying period the sample is allowed to cool to room temperature under a pressure of  $(4 \pm 0,2)$  kPa for a minimum of 24 h. This wetting-drying cycle is performed four times before cutting the test specimen.

Test this specimen and the unexposed reference specimen in accordance with EN 16416.

## 5 Apparatus

The apparatus shall consist of the following:

- a template of known dimensions to a tolerance of  $\pm 0,5\%$  either square with an edge length not less than 200 mm or circular with a diameter not less than 200 mm,
- a waterproof box large enough to accommodate the specimen,