PD CEN/TS 14418:2014

BSI Standards Publication

Geosynthetic Barriers — Test method for the determination of the influence of freezing-thawing cycles on the permeability of clay geosynthetic barriers

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National foreword

This Published Document is the UK implementation of CEN/TS 14418:2014. It supersedes DD CEN/TS 14418:2005 which is withdrawn.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.

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

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English Version

Geosynthetic Barriers - Test method for the determination of the influence of freezing-thawing cycles on the permeability of clay geosynthetic barriers

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

Geosynthetische Dichtungsbahnen - Prüfverfahren zur Bestimmung des Einflusses von Frost-Tau-Zyklen auf die Wasserdurchlässigkeit von geosynthetischen Tondichtungsbahnen

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Foreword

This document (CEN/TS 14418:2014) has been prepared by Technical Committee CEN/TC 189 “Geosynthetics”, the secretariat of which is held by NBN.

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

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Introduction

This Technical Specification defines a method for testing the influence of freezing-thawing cycles on the flux of 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 freezing and thawing cycles in earth constructions. The flux of saturated clay geosynthetic barriers may increase in consequence of repeated freezing-thawing 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 GBR-Cs.

This test determines the influence of freezing-thawing cycles in the absence of any other phenomena, for example cation exchange.

1 Scope

This Technical Specification describes an index test to determine the influence ratio of freezing-thawing cycles on the flux through saturated clay geosynthetic barriers.

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 freezing-thawing 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 specimens is determined with a flexible wall permeameter both on specimens exposed to freezing-thawing cycles and on unexposed reference specimens.

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 ± 0,5 % is hydrated under a pressure of (4 ± 0,2) kPa for 48 h at constant room temperature. After hydration, the specimen is stored in the freezer under a pressure of (4 ± 0,2) kPa at −5 °C for 24 h. After the freezing period the specimen is allowed to thaw under a pressure of (4 ± 0,2) kPa at room temperature for 24 h. Then the specimen is hydrated again for 24 h at room temperature. This freezing-thawing cycle is performed four times before cutting the test specimen.

Eventually the test specimen and the unexposed reference specimen are tested in accordance with EN 16416.

5 Apparatus

The apparatus shall consist of the following:

— a template of known dimensions to a tolerance of ± 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,