

Geosynthetic barriers — Characteristics required for use in the construction of liquid waste disposal sites, transfer stations or secondary containment

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National foreword

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English version

Geosynthetic barriers - Characteristics required for use in the construction of liquid waste disposal sites, transfer stations or secondary containment

Barrières géosynthétiques - Caractéristiques requises pour l'utilisation dans la construction des ouvrages de stockage et d'enfouissement de déchets liquides, des stations de transfert ou de stockage secondaire

Geosynthetische Dichtungsbahnen - Eigenschaften, die für die Anwendung beim Bau von Deponien für flüssige Abfälle, Zwischenlagern und Auffangbecken für flüssige Abfallstoffe erforderlich sind

This European Standard was approved by CEN on 17 March 2003.

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Contents

Page

Foreword.....	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Definitions and abbreviations	8
3.1 Definitions	8
3.2 Abbreviations	9
4 Required characteristics and corresponding methods of test	9
4.1 General.....	9
4.2 Relevant characteristics	9
4.3 Characteristics relevant to specific conditions of use.	12
4.3.1 Tear strength	12
4.3.2 Bursting strength.....	12
4.3.3 Friction characteristics (direct shear and inclined plane tests).	12
4.3.4 Low temperature behaviour.....	12
4.3.5 Weathering	12
4.3.6 Resistance to wetting and drying	12
4.3.7 Freeze-thaw cycle resistance	13
4.3.8 Resistance to root penetration.....	13
5 Evaluation of conformity.....	13
5.1 Presentation of characteristics	13
5.2 Verification of values	13
5.3 Initial type tests.....	13
5.4 Factory production control.....	14
5.5 Inspection	14
6 Marking	14
Annex A (normative).....	15
Scheme of factory production control.....	15
A.1 Product design	15
A.2 Production	15
A.3 Finished products	15
A.4 Equipment.....	15
A.5 Provisions applicable to A.1, A.2 and A.3 (to be used where appropriate).	16
Annex B (normative).....	17
Durability of geosynthetic barriers	17
B.1 Introduction	17
B.2 Evaluation of durability tests and acceptance criteria	18
B.3 Weathering	18
B.3.1 Direct tests.....	18
B.3.2 Period of exposure.....	19
B.4. Resistance to micro-organisms.....	20
B.5 Resistance to root penetration	20
B.6 Resistance to environmental stress cracking.....	20
B.7 Resistance to leaching	20
B.8 Resistance to oxidation	21
B.9 Chemical resistance for landfill applications.....	21
B.9.1 All applications	21
B.9.2 Liquid and solid waste storage (applicable to EN 13492 and prEN 13493).....	21

B.10 Geosynthetic clay barriers	21
Annex ZA (informative)	22
Clauses of this European Standard addressing the provisions of the EU Construction Products Directive.....	
ZA 1. Scope and relevant characteristics	22
ZA.2 System of attestation of conformity for Geomembranes used in the construction of liquid waste disposal sites, transfer stations and secondary containment.....	23
ZA 3. CE marking and labelling	25
Bibliography	29

Foreword

This document (EN 13492:2004) has been prepared by Technical Committee CEN/TC 189 “Geosynthetics”, the secretariat of which is held by IBN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2005, and conflicting national standards shall be withdrawn at the latest by June 2006.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Foreword to amendment A1

This document (EN 13492:2004/A1:2006) has been prepared by Technical Committee CEN/TC 189 “Geosynthetics”, the secretariat of which is held by IBN.

This Amendment to the European Standard EN 13492:2004 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2007, and conflicting national standards shall be withdrawn at the latest by February 2007.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This document allows manufacturers to describe geosynthetic barriers on the basis of declared values for characteristics relevant to the intended use and if tested to the specified method. It also includes procedures for evaluation of conformity and factory production control.

This document can also be used by designers, end-users and other interested parties as a tool to define relevant and appropriate characteristics for specifications and on-site quality control. It should be emphasised however that not all characteristics and test methods quoted in this document are suitable for the purpose of on-site quality control.

Tests for some non-mandated characteristics are still under study and will be included when the standard is revised.

The term “product” used in this document refers to a geosynthetic barrier, including polymeric geosynthetic barriers, clay geosynthetic barriers and bituminous geosynthetic barriers.

This document is part of a group of standards, addressing the requirements for geosynthetic barriers when used in a specific application.

Particular application cases can contain requirements about additional properties and - preferably standardised - test methods, if they are technically relevant and not conflicting with European Standards.

The design life of the product should be determined, since its function may be temporary, as a construction expediency, or permanent, for the lifetime of the structure.

1 Scope

This document specifies the relevant characteristics of geosynthetic barriers, including polymeric geosynthetic barriers, clay geosynthetic barriers and bituminous geosynthetic barriers, when used as fluid barriers in the construction of liquid waste disposal sites, transfer stations and secondary containment, and the appropriate test methods to determine these characteristics.

The intended use of these products is to control the leakage of fluids through the construction.

This document is not applicable to geotextiles or geotextile-related products.

This document provides for the evaluation of conformity of the product to this document.

This document defines requirements to be met by manufacturers and distributors with regard to the presentation of product properties.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 495-5	<i>Flexible sheets for waterproofing – Determination of foldability at low temperature – Part 5: Plastic and rubber sheets for roof waterproofing</i>
EN 963	<i>Geotextiles and geotextile-related standards – Sampling and preparation of test specimens</i>
EN 964-1	<i>Geotextiles and geotextile-related products – Determination of thickness at specified pressures - Part 1: Single layers</i>
EN 1109	<i>Flexible sheets for waterproofing – Bitumen sheets for roof waterproofing - Determination of flexibility at low temperature</i>
EN 1849-1	<i>Flexible sheets for waterproofing – Determination of thickness and mass per unit area – Part 1: Bitumen sheets for roof waterproofing</i>
EN 1849-2	<i>Flexible sheets for waterproofing – Determination of thickness and mass per unit area – Part 2: Plastic and rubber sheets for roof waterproofing</i>
EN 12224	<i>Geotextiles and geotextile-related products – Determination of the resistance to weathering</i>
EN 12225	<i>Geotextiles and geotextile-related products – Method for determining the microbiological resistance by a soil burial test</i>
EN 12226	<i>Geotextiles and geotextile-related products – General tests for evaluation following durability testing</i>
EN 12310-1	<i>Flexible sheets for waterproofing – Part 1: Bitumen sheets for waterproofing – Determination of resistance to tearing (nail shank)</i>
EN 12311-1	<i>Flexible sheets for waterproofing – Part 1: Bitumen sheets for roof waterproofing – Determination of tensile properties</i>

EN 13361	<i>Geosynthetic barriers – Characteristics required for use in the construction of reservoirs and dams</i>
prEN 13362	<i>Geosynthetic barriers – Characteristics required for use in the construction of canals.</i>
EN 13491	<i>Geosynthetic barriers – Characteristics required for use as a fluid barrier in the construction of tunnels and underground structures</i>
prEN 13493 ^{A1} :2005 ^{A1}	<i>Geosynthetic barriers – Characteristics required for use in the construction of solid waste storage and disposal sites, and storages for hazardous solid materials</i>
prEN 14150	<i>Geosynthetic barriers – Determination of permeability to liquids</i>
prEN 14151	<i>Geosynthetics – Determination of burst strength</i>
EN 14196	<i>Geosynthetics – Test methods for measuring mass per unit area of clay geosynthetic barriers</i>
EN 14414	<i>Geosynthetics – Screening test method for determining chemical resistance for landfill applications</i>
EN 14415	<i>Geosynthetic barriers – Test method for determining the resistance to leaching</i>
prCEN/TS 14416	<i>Geosynthetic barriers – Test method for determining the resistance to roots</i>
prEN 14417	<i>Geosynthetic barriers – Test method for the determination of the influence of wetting-drying cycles on the permeability of clay geosynthetic barriers</i>
prEN 14418	<i>Geosynthetic barriers – Test method for the determination of the influence of freezing-thawing cycles on the permeability of clay geosynthetic barriers</i>
prEN 14575	<i>Geosynthetic barriers – Screening test method for determining the resistance to oxidation</i>
prEN ISO 10318:2002	<i>Geosynthetics – Terms and definitions (ISO/FDIS 10318:2004)</i>
EN ISO 10319	<i>Geotextiles – Wide-width tensile test (ISO 10319:1993)</i>
EN ISO 10320	<i>Geotextiles and geotextile-related products – Identification on site (ISO 10320:1999)</i>
EN ISO 12236	<i>Geotextiles and geotextile-related products – Static puncture test (CBR-Test) (ISO 12236:1996)</i>
prEN ISO 12957-1	<i>Geosynthetics – Determination of friction characteristics – Part 1: Direct shear test (ISO/FDIS 12957-1:2004)</i>
prEN ISO 12957-2	<i>Geosynthetics – Determination of friction characteristics – Part 2: Inclined plane test (ISO/FDIS 12957-2:2004)</i>
prEN ISO 13438	<i>Geotextiles and geotextile-related products – Screening test method for determining the resistance to oxidation at elevated oxygen pressure (ISO/FDIS 13438:2004)</i>

ISO 34	<i>Plastics - Tear strength</i>
ISO R 527-1 ^{A1} :1993 ^{A1}	<i>Plastics -- Determination of tensile properties -- Part 1: General principles</i>
ISO R 527-3	<i>Plastics -- Determination of tensile properties -- Part 3: Test conditions for films and sheets</i>
^{A1} ISO 527-4	<i>Plastics -- Determination of tensile properties -- Part 4: Test conditions for isotropic and orthotropic fibre-reinforced plastic composites ^{A1}</i>
ASTM D 696-91	<i>Standard test method for coefficient of linear thermal expansion of plastics between -30 °C and 30 °C.</i>
ASTM D 1434-82	<i>Standard test method for determining gas permeability characteristics of plastic film and sheeting</i>
ASTM D 5397-99	<i>Standard test method for evaluation of stress crack resistance of polyolefin geomembranes using notched constant tensile load test</i>
ASTM D 5887-95	<i>Standard test method for measurement of index flux through saturated geosynthetic clay liner specimens using a flexible wall permeameter</i>
ASTM D 5890-95	<i>Standard test method for swell index of clay mineral component of geosynthetic clay liners.</i>

3 Definitions and abbreviations

3.1 Definitions

For the purpose of this document the definitions given in prEN ISO 10318:2002 and the following apply:

3.1.1

product

geosynthetic barrier, including polymeric, bituminous and clay barriers

3.1.2

specification

any document in which the works, functions, specific conditions and required material property values of the geosynthetic barrier of use are described

3.1.3

hazardous liquid

any liquid listed as hazardous by national or international regulations and intended for further use

3.1.4

liquid waste

Any waste in liquid form, including waste water but excluding liquid-solid mixtures having capability to be handled as, or mixed with solid waste for storage purposes

3.1.5

transfer station

site or construction where liquid waste is stored in view of its further transport for recovery, treatment or disposal elsewhere

3.1.6

secondary containment

barrier system designed to collect and store any hazardous leakage from a storage system

3.1.7

basal liner

material which forms the main barrier to prevent the escape of contained fluids from the base of the facility