
Geosintetične zapore - Zahtevane lastnosti za uporabo pri konstrukciji odlagališč za tekoče odpadke, prenosnih postaj in drugih zabojnikov

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

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

Géomembranes, géosynthétiques bentonitiques - Caractéristiques requises pour l'utilisation dans la construction des sites d'évacuation de résidus liquides, des stations de transfert ou enceintes de confinement secondaire

Ta slovenski standard je istoveten z: EN 13492:2004

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**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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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of an identical text or by endorsement, at the latest by March 2005, and conflicting national standards shall be withdrawn at the latest by June 2006.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.

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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.

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EN 13492:2004 (E)

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> SIST EN 13492:2005
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	<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>

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ISO 34	<i>Plastics - Tear strength</i>
ISO R 527-1	<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>
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**

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

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3.1.1 product <https://standards.iteh.ai/catalog/standards/sist/b8e7e58e-4f3a-4f4d-8ed3-b5bc6d3338c3/sist-en-13492-2005>

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

3.1.8

side liner

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

3.1.9

capping liner

material placed above the waste or contaminated material to prevent the ingress of water and the uncontrolled escape of fluids and/or gases

3.2 Abbreviations

For the purpose of this document the abbreviations of prEN ISO 10318:2002 and the following apply:

GBR-P : polymeric geosynthetic barrier

GBR-B : bituminous geosynthetic barrier

GBR-C : clay geosynthetic barrier

4 Required characteristics and corresponding methods of test

4.1 General

The main function of geosynthetic barriers used in the construction of liquid waste disposal sites, transfer stations and secondary containment, is to prevent the movement of fluids through the construction and to prevent the stored hazardous liquids or the leachate of the stored materials to escape into the environment. This includes the use of a geosynthetic barrier as a basal, side or capping liner. Damage during installation has not been addressed in this document.

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4.2 Relevant characteristics

The characteristics and the test methods to be used, are given in Table 1. The list of characteristics in Table 1 includes those relevant to all conditions of use and subject to harmonisation (H) (see Annex D), those relevant to all conditions of use and not subject to harmonisation (A), and those relevant to specific conditions of use and not subject to harmonisation (S).

The functions and conditions of use, corresponding with the characteristics, marked with “S” in table 1, are specified in 4.3.

The manufacturer shall provide the data based on the results of tests specified in this document and where relevant, in accordance with 5.1.

The manufacturer shall provide information on how functioning joints can be made. Where products are jointed in the factory the water permeability and if relevant the strength of the joints shall be tested and data presented.

Table 1: Geosynthetic Barriers used in the construction of liquid waste disposal sites, transfer stations and secondary containment - Functions, function-related characteristics and test methods to be used.

		Geosynthetic Barrier			Test Methods			Remarks
Nr	Property to be tested	GBR-P	GBR-B	GBR-C	GBR-P	GBR-B	GBR-C	
Physical Properties								
1	Thickness	A	A	A	EN 1849-2	EN 1849-1	EN 964-1	
2	Mass per unit area	A	A	A	EN 1849-2	EN 1849-1	EN 14196	
Hydraulic Properties								
3	Water permeability (liquid tightness)	H	H	H	pr EN 14150	pr EN 14150	ASTM D 5887-95	
4	Gas permeability (gas tightness)	H	H	-	ASTM D 1434	ASTM D 1434	-	Only applicable for cap and cover liners.
5	Swell Index	-	-	A	-	-	ASTM D 5890-95	
Mechanical Properties								
6	Tensile strength	H	H	H	ISO R 527	EN 12311-1	EN ISO 10319	For GBR-P use ISO 527 part 1 and 3, test specimen type 5 at a speed of 100 mm/min and report the maximum strength measured in accordance with the test method
7	Elongation	A	A	A	ISO R 527	EN 12311-1	EN ISO 10319	For GBR-P use ISO 527 part 1 and 3, test specimen type 5 at a speed of 100 mm/min; calculation of elongation as defined in ISO 527-1, 10.2 using grip separation measurement..
8	Static Puncture	H	H	H	EN ISO 12236	EN ISO 12236	EN ISO 12236	
9	Burst Strength	S	S	S	prEN 14151	prEN 14151	prEN 14151	This test apply to GBR-C only if they contain a polymeric or bituminous barrier element
10	Tear strength	S	S	S	ISO 34	EN 12310-1	-	For GBR-P use Method B, angle Specimen (Fig 2) without nick at a speed of 50 mm/min
11	Friction Direct shear	S	S	S	prEN ISO 12957-1	prEN ISO 12957-1	prEN ISO 12957-1	
12	Friction Inclined Plane	S	S	S	prEN ISO 12957-2	prEN ISO 12957-2	prEN ISO 12957-2	
Thermal Properties								
13	Low temp behaviour (flexure)	S	S	S	EN 495-5	EN 1109	-	