SLOVENSKI STANDARD
SIST EN 13361:2004

01-oktober-2004

Geosintetiļ ne ovire ï Zahtevane karakteristike pri gradnji rezervoarjev in nasipov

Geosynthetic barriers - Characteristics required for use in the construction of reservoirs and dams

Geosynthetische Dichtungsbahnen - Eigenschaften, die für die Anwendung beim Bau von Rückhaltebecken und Staudämmen erforderlich sind

Géomembranes, géosynthétiques bentonitiques - Caractéristiques requises pour l'utilisation dans la construction des réservoirs et des barrages

Ta slovenski standard je istoveten z: EN 13361:2004

ICS:

59.080.70	Geotekstilije	Geotextiles
91.100.50	Veziva. Tesnilni materiali	Binders. Sealing materials

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Geosynthetic barriers - Characteristics required for use in the construction of reservoirs and dams

Barrières géosynthétiques - Caractéristiques requises pour l'utilisation dans la construction des réservoirs et des barrages

Geosynthetische Dichtungsbahnen - Eigenschaften, die für die Anwendung beim Bau von Wasserbecken und Staudämmen erforderlich sind

This European Standard was approved by CEN on 18 March 2003.

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Foreword

This document (EN 13361:2004) 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of an identical text or by endorsement, at the latest by February 2005, and conflicting national standards shall be withdrawn at the latest by May 2006.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.

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 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, to be used as fluid barriers in the construction of reservoirs and dams, and the appropriate test methods to determine these characteristics.

The intended use of these products is to control the leakage of water 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 their authorised representatives with regard to the presentation of product properties.

This document does not cover applications where the geosynthetic barrier is to be in contact with water that has been treated for human consumption.

NOTE: Where potable water is or may be in direct contact with the product the designer should also refer to other relevant standards, requirements and/or regulations.

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 *Flexible sheets for waterproofing – Determination of foldability at low temperature – Part 5: Plastic and rubber sheets for roof waterproofing*

EN 963 *Geotextiles and geotextile-related products – Sampling and preparation of test specimens*

EN 964-1 *Geotextiles and geotextile-related products – Determination of thickness at specified pressures - Part 1: single layers*

EN 1109 *Flexible sheets for waterproofing – Bitumen sheets for roof waterproofing – Determination of flexibility at low temperature*

EN 1849-1 *Flexible sheets for waterproofing – Determination of thickness and mass per unit area – Part 1: bitumen sheets for roof waterproofing*

EN 1849-2 *Flexible sheets for waterproofing – Determination of thickness and mass per unit area – Part 2: Plastic and rubber sheets for roof waterproofing*

EN 12224 *Geotextiles and geotextile-related products – Determination of the resistance to weathering*

EN 12225 *Geotextiles and geotextile-related products – Method for determining the microbiological resistance by a soil burial test*

EN 12226 *Geotextiles and geotextile-related products – General tests for evaluation following durability testing*

EN 12310-1 *Flexible sheets for waterproofing – Part 1: Bitumen sheets for waterproofing – Determination of resistance to tearing (nail shank)*

EN 12311-1 *Flexible sheets for waterproofing – Part 1: Bitumen sheets for roof waterproofing – Determination of tensile properties*

prEN 13362 *Geosynthetic barriers – Characteristics required for use in the construction of canals.*

EN 13491 *Geosynthetic barriers – Characteristics required for use as a fluid barrier in the construction of tunnels and underground structures*

EN 13492 *Geosynthetic barriers – Characteristics required for use in construction of liquid waste disposal sites, transfer stations or secondary containment*

prEN 13493 *Geosynthetic barriers – Characteristics required for use in the construction of solid waste storage and disposal sites, and storages for hazardous solid materials*

prEN 14150 *Geosynthetic barriers – Determination of permeability to liquids*

prEN 14151 *Geosynthetics – Determination of burst strength*

EN 14196 *Geosynthetics – Test methods for measuring mass per unit area of clay geosynthetic barriers*

EN 14414:2004	*Geosynthetics – Screening test method for determining chemical resistance for landfill applications*
EN 14415	*Geosynthetic barriers – Test method for determining the resistance to leaching*
prCEN/TS 14416	*Geosynthetic barriers – Test method for determining the resistance to roots*
prEN 14417	*Geosynthetic barriers – Test method for the determination of the influence of wetting-drying cycles on the permeability of clay geosynthetic barriers*
prEN 14418	*Geosynthetic barriers – Test method for the determination of the influence of freezing-thawing cycles on the permeability of clay geosynthetic barriers*
prEN 14575	*Geosynthetic barriers – Screening test method for determining the resistance to oxidation*
prEN ISO 10318:2002	*Geosynthetics – Geotextiles, geotextile-related products, geomembranes and geosynthetic clay liners – Terms and their definitions (IS0 10318:2000)*
EN ISO 10319	*Geotextiles – Wide-width tensile test (ISO 10319:1993)*
EN ISO 10320	*Geotextiles and geotextile-related products – Identification on site (ISO 10320:1999)*
EN ISO 12236	*Geotextiles and geotextile-related products – Static puncture test (CBR-Test) (ISO 12236:1996)*
prEN ISO 12957-1	*Geosynthetics – Determination of friction characteristics – Part 1: Direct shear test (ISO 12957-1:2004)*
prEN ISO 12957-2	*Geosynthetics – Determination of friction characteristics – Part 2: Inclined plane test (ISO/FDIS 12957-2:2004)*
prEN ISO 13438	*Geotextiles and geotextile-related products – Screening test method for determining the resistance to oxidation at elevated oxygen pressure (ISO/DIS 13438:2002)*
ISO 34	*Plastics – Tear strength*
ISO R 527-1	*Plastics – Determination of tensile properties – Part 1: General principles*
ISO R 527-3	*Plastics – Determination of tensile properties – Part 3: Test conditions for films and sheets*
ASTM D 696-91	*Standard test method for coefficient of linear thermal expansion of plastics between -30 °C and 30 °C.*
ASTM D 5397-99	*Standard test method for evaluation of stress crack resistance of polyolefin geomembranes using notched constant tensile load test*
ASTM D 5887-95	*Standard test method for measurement of index flux through saturated geosynthetic clay liner specimens using a flexible wall permeameter*
ASTM D 5890-95	*Standard test method for swell index of clay mineral component of geosynthetic clay liners.*

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
reservoir
naturally occurring space or construction for storage, regulation and control of water

3.1.4
dam
barrier constructed to hold back water to raise its level, form a reservoir or reduce or prevent flooding

3.1.5
upstream face
The face of the dam that is normally in contact with the enclosed water

3.1.6
downstream face
The face of a dam that is normally not in contact with the enclosed water

3.1.7
revetment
construction that comprises one or more layers of material to provide protection to a slope against erosion

3.1.8
top water level
maximum operating water level in any structure

3.2 Abbreviations

For the purpose of this document the abbreviations given in prEN ISO 10318:2002 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

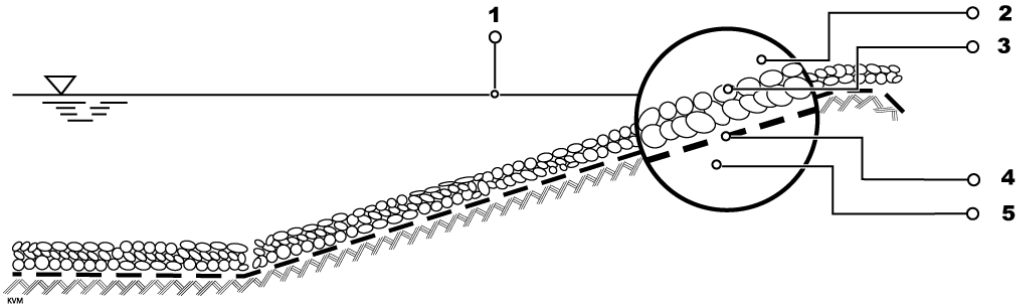
The main function of geosynthetic barriers when used in the construction of reservoirs and dams is to prevent or reduce the flow of fluid through the structure. Damage during installation has not been addressed in this document.

4.2 Types of Application

It is not normally advisable to install a geosynthetic barrier on the outside face of a dam. Special consideration should be given to any geosynthetic barrier installed on the downstream face of a dam. The applications described in this document do not include such situations.

4.2.1 Application 1: "covered in service"

Applications where the product is laid on the upstream face of a dam or in a reservoir and is covered in service with a revetment or other protective layers. Figures 1 and 2 show typical installations.



Key

1 Top water level
2 Upstream face
3 Revetment
4 Geosynthetic barrier
5 Dam body

Figure 1 - A geosynthetic barrier on a reservoir or dam slope, covered in service