



SLOVENSKI STANDARD
oSIST prEN 17097:2017
01-april-2017

Geosintetika - Zahtevane lastnosti za uporabo pri nadzoru erozije na pobočjih in obrobjih

Geosynthetics - Characteristics required for use in surface erosion control on slopes and banks

Geokunststoffe - Geforderte Eigenschaften, die für die Anwendung beim Bau von Oberflächenerosionsschutz für Böschungen und Mulden erforderlich sind

Géosynthétiques - Caractéristiques requises pour le contrôle de l'érosion sur talus et berges

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Geosynthetics - Characteristics required for use in surface erosion control on slopes and banks

Geokunststoffe - Eigenschaften, die für die Anwendung beim Bau von Oberflächenerosionsschutz für Böschungen und Dämme erforderlich sind

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 189.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (prEN 17097:2017) has been prepared by Technical Committee CEN/TC 189 “Geosynthetics”, the secretariat of which is held by NBN.

This document is currently submitted to the CEN Enquiry.

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

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Introduction

This European Standard allows manufacturers to describe geosynthetics 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 the assessment and verification of constancy of performance and factory production control.

This European Standard may also be used by designers, end-users and other interested parties to define which functions and conditions of use are relevant.

The term “product” used in this European Standard refers to geosynthetics.

This European Standard is part of a series of standards, addressing the requirements for geosynthetics when used in a specific application.

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1 Scope

This European Standard specifies the relevant characteristics of geosynthetics used in surface erosion control on slopes and banks and the appropriate test methods to determine these characteristics. This standard does not include external erosion control covered by EN 13253.

The intended use of these geosynthetics is to fulfil the function: surface erosion control.

This European Standard is not applicable to geosynthetic barriers, as defined in EN ISO 10318-1.

This European Standard provides for the assessment and verification of constancy of performance of the product to this European Standard and for factory production control procedures.

NOTE Particular application cases may contain requirements regarding additional properties and – preferably standardized – test methods, if they are technically relevant.

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.

CEN/TS 14416, *Geosynthetic barriers - Test method for determining the resistance to roots*

EN 1484, *Water analysis - Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC)*

EN 1848-2, *Flexible sheets for waterproofing - Determination of length, width, straightness and flatness - 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, *Geosynthetics - General tests for evaluation following durability testing*

EN 12447, *Geotextiles and geotextile-related products - Screening test method for determining the resistance to hydrolysis in water*

EN 12457-1, *Characterisation of waste - Leaching - Compliance test for leaching of granular waste materials and sludges - Part 1: One stage batch test at a liquid to solid ratio of 2 l/kg for materials with high solid content and with particle size below 4 mm (without or with size reduction)*

EN 13501-1, *Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests*

EN 1744-3, *Tests for chemical properties of aggregates - Part 3: Preparation of eluates by leaching of aggregates*

EN ISO 291, *Plastics - Standard atmospheres for conditioning and testing (ISO 291)*

EN ISO 1043-1, *Plastics - Symbols and abbreviated terms - Part 1: Basic polymers and their special characteristics (ISO 1043-1)*

EN ISO 1856, *Flexible cellular polymeric materials - Determination of compression set (ISO 1856)*

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

EN ISO 9862, *Geosynthetics - Sampling and preparation of test specimens (ISO 9862)*

EN ISO 9863-1, *Geosynthetics - Determination of thickness at specified pressures - Part 1: Single layers (ISO 9863-1)*

EN ISO 9864, *Geosynthetics - Test method for the determination of mass per unit area of geotextiles and geotextile-related products (ISO 9864)*

EN ISO 10318-1, *Geosynthetics - Part 1: Terms and definitions (ISO 10318-1)*

EN ISO 10319, *Geosynthetics - Wide-width tensile test (ISO 10319)*

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

EN ISO 11058, *Geotextiles and geotextile-related products - Determination of water permeability characteristics normal to the plane, without load (ISO 11058)*

EN ISO 11925-2, *Reaction to fire tests - Ignitability of products subjected to direct impingement of flame - Part 2: Single-flame source test (ISO 11925-2)*

EN ISO 12956, *Geotextiles and geotextile-related products - Determination of the characteristic opening size (ISO 12956:2010)*

EN ISO 13426-1, *Geotextiles and geotextile-related products - Strength of internal structural junctions - Part 1: Geocells (ISO 13426-1)*

EN ISO 13426-2, *Geotextiles and geotextile-related products - Strength of internal structural junctions - Part 2: Geocomposites (ISO 13426-2)*

EN ISO 13438, *Geotextiles and geotextile-related products - Screening test method for determining the resistance to oxidation (ISO 13438)*

EN ISO 25619-2, *Geosynthetics - Determination of compression behaviour - Part 2: Determination of short-term compression behaviour (ISO 25619-2)*

ISO 565, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings*

ISO 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

ASTM D4603-03(2011)e1, *Standard Test Method for Determining Inherent Viscosity of Poly(Ethylene Terephthalate) (PET) by Glass Capillary Viscometer*

ASTM D6567, *Standard Test Method for Measuring the Light Penetration of a Turf Reinforcement Mat (TRM)*

ASTM D7322, *Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Ability to Encourage Seed Germination and Plant Growth Under Bench-Scale Conditions*

ASTM D7409 — 07e1, *Standard Test Method for Carboxyl End Group Content of Polyethylene Terephthalate (PET) Yarns*

ASTM D7748, *Standard Test Method for Flexural Rigidity of Geogrids, Geotextiles and Related Products*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 10318-1 and the following apply.

3.1.1

product

geosynthetic including erosion control products made of 100% natural components, e.g. coir, jute, straw, wool

3.1.2

specification

any document in which the work, functions and specific conditions of use of the product are described

3.1.3

rework material (RWM)

material that is generated in a process and capable of being reclaimed within the same process that generated it

3.1.4

post-consumer material (PCM)

material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain

3.1.5

post-industrial material (PIM)

material diverted from the waste stream during a manufacturing process

3.1.6

surface erosion control (SEC)

the use of a geosynthetic material to prevent or limit soil or other particle movements at the surface of, for example, a slope or a bank

3.1.7

geoblanket (GBL)

permeable structure of loose natural and/or synthetic fibres and other elements (natural or synthetic) bonded together to form a continuous sheet

3.1.8

geotextile (GTX)

planar, permeable, polymeric (synthetic or natural) textile material, which may be nonwoven, knitted or woven, used in contact with soil and/or other materials in geotechnical and civil engineering applications

3.1.9

geomat (GMA)

three-dimensional, permeable structure, made of polymeric monofilaments, and/or other elements (synthetic or natural), mechanically and/or thermally and/or chemically and/or otherwise bonded

prEN 17097:2017 (E)**3.1.10****reinforced geomat (GMA-R)**

geocomposite composed of a geomat and reinforcing elements like e.g. geogrid, yarns or steel meshes

3.1.11**Geocell (GCE)**

three-dimensional, permeable, polymeric (synthetic or natural) honeycomb or similar cellular structure, made of linked strips of geosynthetics

3.1.12**nominal width and length**

for stretchable products that exhibit high lateral contraction e.g. GCE, knitted GMA the nominal width and the nominal length of the product are the values declared by the supplier

3.2 Abbreviations

For the purposes of this document, the abbreviations given in EN ISO 1043-1 and EN ISO 10318-1 and the following apply.

- GBL: geoblanket
- GCE: geocell
- GMA: geomat
- GMA-R: reinforced geomat
- GTX: geotextile
- PCM: post-consumer material
- PIM: post-industrial material
- RWM: rework material
- SEC: surface erosion control

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4 Required characteristics and corresponding methods of test**4.1 General**

The main function of geosynthetics used in surface erosion control on slopes and banks is surface erosion control. If reinforcement is integrated in the construction, the requirements of the appropriate standards shall also be fulfilled.

The specification shall define which conditions of use are relevant (see Table 1). The producer shall provide the necessary data based on the requirements and test methods specified in this European Standard, as described in 5.1.

The characteristics, their relevance to the conditions of use, and the test methods to be used, are specified in Table 1. The list of characteristics in Table 1 includes, those relevant to all conditions of use (A), and those relevant to specific conditions of use (S). The indication “-” means that the characteristic is not relevant for that function.

Where, for the same property, data for more than one function shall be provided, the following ranking order shall be observed: A overrides S, and S overrides “-”.

The functions and conditions of use, corresponding with the S-coded characteristics in Table 1, are specified in 4.3.

Durability shall be assessed in accordance with the requirements of Annex A.

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4.2 Selection of the appropriate standard in a specific application

Table 1 — Geosynthetics used in surface erosion control on slopes and banks –Test methods to be used

| Characteristic | Test method | Filled in service / covered | | | | | Not filled in service / not covered | | | | Remarks |
|--|----------------------|-----------------------------|-----|-----|-------|-----|-------------------------------------|-----|-------|-----|--|
| | | GBL | GMA | GCE | GMA-R | GTX | GBL | GMA | GMA-R | GTX | |
| (1) Thickness at 0,2 kPa | Annex B | A | A | - | A | A | A | A | A | A | |
| (2) Height | EN 1848-2 | - | - | A | - | - | - | - | - | - | |
| (3) Mass per unit area | EN ISO 9864 | A | A | - | A | A | A | A | A | A | |
| (4) Tensile strength | EN ISO 10319 | A | A | - | A | A | A | A | A | A | If the product is used for the function SEC only, a test speed of 100 mm/min shall be used. |
| (5) Elongation at maximum load | EN ISO 10319 | A | A | - | A | A | A | A | A | A | If the product is used for the function SEC only, the tensile strain at maximum load shall be measured between the clamps and reported. |
| (6) Strength of internal structural junctions of geocells | EN ISO 13426-1 | - | - | A | - | - | - | - | - | - | All tests have to be carried out. |
| (7) Strength of internal structural junctions of geocomposites | EN ISO 13426-2 | S | S | - | S | - | S | S | S | - | If a GMA is also a geocomposite consisting of different layers. |
| (8) Short-term compressive behaviour | EN ISO 25619-2 | S | S | - | S | S | S | S | S | S | |
| (9) Rebound resilience | Annex C | S | S | - | S | S | S | S | S | S | |
| (10) Flexibility | following ASTM D7748 | A | A | - | A | A | A | A | A | A | Report bending length in the “as-rolled-out” situation The minimum specimen width is 200 mm. MD and CMD shall be tested. |

| | | | | | | | | | | | |
|--|--------------|---|---|---|---|---|---|---|---|---|--|
| (11) Behaviour at low and high temperatures | Annex D | S | S | S | S | S | S | S | S | S | Where appropriate a compression test or a tensile test at the relevant temperatures shall be performed. Tensile/compression strength at a given temperature, retained tensile/compression strength and strain at maximum load (measured between clamps) shall be reported. |
| (12) Opening size | Annex E | A | A | - | A | A | A | A | A | A | The opening size is relevant for the evaluation of the penetration of leaflets (not filled in service) and rootlets (filled in service) through the product. |
| (13) Turf-filling ratio | Annex F | - | S | - | S | - | - | - | - | - | |
| (14) Light transmission | ASTM D6567 | | | | | | A | A | A | A | The light transmission is relevant for the evaluation of the product that the sunlight can reach the in-light growing seeds through the product. |
| (15) Water permeability normal to the plane | EN ISO 11058 | S | S | S | S | S | S | S | S | S | |
| (16) Water absorption capacity (method immersion) | Annex G | - | - | - | - | - | A | - | - | A | The water absorption is relevant for the evaluation of the product to absorb the maximum moisture content after immersion in water. |
| (17) Resistance to weathering | EN 12224 | A | A | A | A | A | A | A | A | A | Covered: 50 MJ/m ² Uncovered: 350 MJ/m ² |
| (18) Smoulder resistance | Annex H | A | A | A | A | A | A | A | A | A | The smoulder resistance is relevant for the evaluation of the risk of a fire induced by a cigarette. |
| (19) Microbiological resistance (soil burial test) | EN 12225 | A | A | A | A | A | A | A | A | A | Except virgin PP, PE, PET, PA |
| (20) Root penetration | CEN/TS 14416 | S | S | - | S | S | - | - | - | - | Products with opening size less than 1 mm |
| (21) Plant growth | ASTM D7322 | S | S | S | S | S | S | S | S | S | Typical local seed mix may be used. |