



eurobent
KEEP ROLLING



GCL Drop IN

TABLE OF CONTENTS

Table of Contents

1. General	3
2. Normative references	3
2.1. Harmonized technical specification	3
2.2. International Organization for Standardization	4
2.3. American Society for Testing and Materials (ASTM)	4
2.4. Geosynthetic Research Institute	5
3. Definitions	5
4. Qualifications	6
4.1. Manufacturer.....	6
4.2. Installer	6
5. Quality Management	6
6. About Eurobent	7
7. Labeling, delivery & storage, handling	8
7.1. Labelling	8
7.2. Delivery & storage	8
7.3. Handling	9
8. After delivery inspection	9
9. Warranty	10
10. Product & Quality	10
10.1. Materials	11
11. GCL Properties	12
11.1. Eurobent 5000	12
11.2. Eurobent CS 0,2 (5000)	13
12. Minimum frequency of controls and tests of GCL	14
13. Minimum frequency of controls and tests of GCL CS	15
14. Installation	16
14.1. Subgrade Preparation	16
14.2. Installation of EUROBENT GCL	16
14.3. Anchor Trench	18
14.4. Damage Repair	18
14.5. Cover Placement	19
14.6. Hydration	19

1. General

The following specification is a sample guideline that can be customized by the engineer to prepare requirements for a specific site. This information is provided for reference purposes only and is not intended as warranty. Eurobent Sp. z o.o. does not assume any liability in connection with the use of this information.

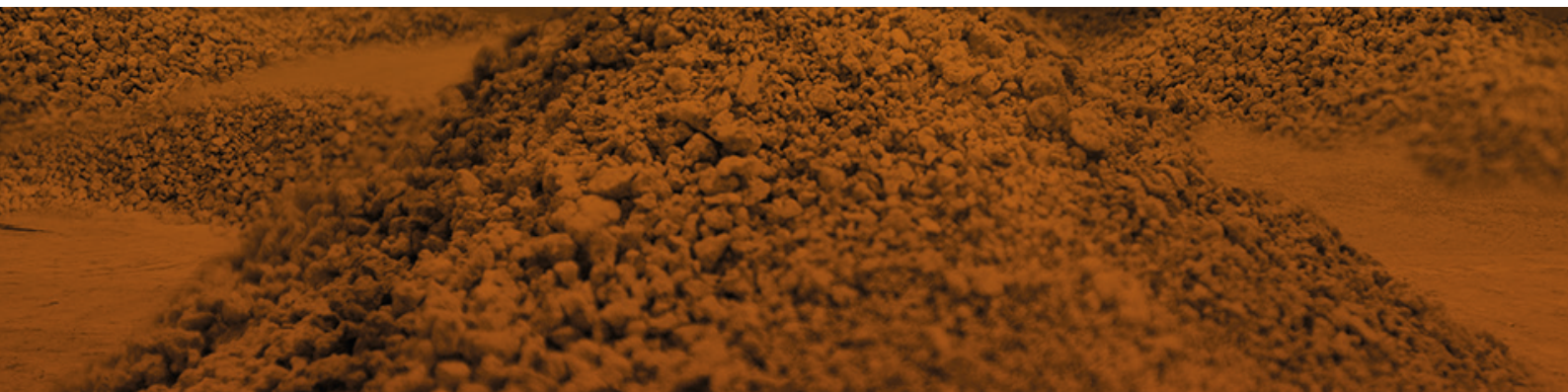
This document describes the basic content of the most important documents and facts related to quality and production management in our company.

It should be noted that GCL is our first and main production branch, nevertheless all principles related to quality and production apply also to other products from our range.

2. Normative references

2.1. Harmonized technical specification

1. **EN 13361:2004/A1:2006** – „Geosynthetic barriers – Characteristics required for use in the construction of reservoirs and dams“
2. **EN 13362:2005** – „Geosynthetic barriers – Characteristics required for use in the construction of canals“
3. **EN 13491:2004/A1:2006** – „Geosynthetic barriers – Characteristics required for use as a fluid barrier in the construction of tunnels and underground structures“
4. **EN 13492:2004/A1:2006** – „Geosynthetic barriers – Characteristics required for use in the construction of liquid waste disposal sites, transfer station or secondary containment“
5. **EN 13493:2005** – „Geosynthetic barriers – Characteristics required for use in the construction of solid waste storage and disposal sites“
6. **EN ISO 13967:2012** – „Flexible sheets for waterproofing – Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet – Definitions and characteristics“
7. **EN 15382:2013** – Geosynthetic barriers – characteristics required for use in transportation infrastructure



2.2. International Organization for Standardization

1. **EN 16416:2013** – „Geosynthetic clay barriers – Determination of water flux index – Flexible wall permeameter method of constant head”
2. **EN ISO 9863-1:2016** – „Geosynthetics – Determination of thickness at specified pressures – Part 1: Single layers”
3. **EN ISO 9864:2005** – „Geosynthetics – Test method for the determination of mass per unit area of geotextiles and geotextile-related products”
4. **EN ISO 10318-1:2015** – „Geosynthetics – Part 1: Terms and definitions”
5. **EN ISO 10319:2015** – „Geosynthetics – Wide-width tensile test”
6. **EN ISO 12236:2006** – „Geosynthetics – Static puncture test (CBR test)”

2.3. American Society for Testing and Materials (ASTM)

1. **ASTM D 5993** – “Standard Test Method for Measuring Mass Per Unit of Geosynthetic Clay Liners”
2. **ASTM D 5261** – “Standard Test Method for Measuring Mass Per Unit Area of Geotextiles”
3. **ASTM D 5887** – “Measurement of Index Flux Through Saturated Geosynthetic Clay Liner Specimens Using a Flexible Wall Permeameter”
4. **ASTM D 5888** – “Standard Guide for Storage and Handling of Geosynthetic Clay Liners”
5. **ASTM D 5889** – “Standard Practice for Quality Control of Geosynthetic Clay Liners”
6. **ASTM D 5890** – “Standard Test Method for Swell Index of Clay Mineral Component of Geosynthetic Clay Liners”
7. **ASTM D 5891** – “Standard Test Method for Fluid Loss of Clay Component of Geosynthetic Clay Liners”
8. **ASTM D 5993** – “Standard Test Method for Measuring Mass Per Unit of Geosynthetic Clay Liners”
9. **ASTM D 6102** – “Standard Guide for Installation of Geosynthetic Clay Liners”
10. **ASTM D 6243** – “Standard Test Method for Determining the Internal and Interface Shear Resistance of Geosynthetic Clay Liner by the Direct Shear Method”
11. **ASTM D 6496** – “Standard Test Method for Determining Average Bonding Peel Strength Between the Top and Bottom Layers of Needle-Punched Geosynthetic Clay Liners”
12. **ASTM D 6768** – “Standard Test Method for Tensile Strength of Geosynthetic Clay Liners”

2.4. Geosynthetic Research Institute

1. **GRI GCL 3** - “Test Methods, Required Properties, and Testing Frequencies of Geosynthetic Clay Liners (GCLs)”.

3. Definitions

1. **Geosynthetic Clay Liner (GCL)** - A factory manufactured hydraulic barrier consisting of granular sodium bentonite clay, sandwiched between two geotextiles, held together thanks to needle-punching.
2. **Geotextile** - A semi-permeable woven or nonwoven fabric used to contain the bentonite in GCL.
3. **Bentonite** - The high swelling clay component of GCLs consisting primarily of the clay mineral called montmorillonite.
4. **Needle-punching** - A process whereby boards of barbed needles incorporate the staple fibers from a nonwoven geotextile, through a sodium bentonite clay layer, into the matrix of a second geotextile layer.
5. **Thermally locking** - A needle-punching enhancement process utilizing heat to bond the needle-punched fibers and permanently lock them into the second geotextile to increase the internal shear strength characteristics.
6. **ITR** - Internal Test Report, also called MQA or Mill test etc.



4. Qualifications

4.1. Manufacturer

- 1.** GCL shall be manufactured by the following:
 - a.** Eurobent Sp. z o.o.
 - b.** Equal manufacturer approved by the project engineer
- 2.** MANUFACTURER shall have a yearly production capacity of minimum 3 million m² and be present on the market for at least a decade.

4.2. Installer

- 1.** Installer shall have experience in installing GCL on at least 5 projects and shall have installed a minimum of 500 000 m² of GCL material.



5. Quality Management

Eurobent has an in-house laboratory where qualified staff ensures product quality from the receipt of raw materials, through the production process, to testing on finished products.

Cooperation with external certified laboratories allows continuous control of our products and their level of testing in our plant.

ISO, CE and other certificates, which we renew through periodic audits, attest to the highest level of our production process and quality control.

6. About Eurobent

Eurobent Sp. z o.o. is a Polish company from Lower Silesia.

Eurobent is a producer of Geosynthetic Clay Liners (GCL), also called bentonite mats, serving as a sealing barrier specialized in a permanent protection against water penetration and leaching of toxic substances. A typical GCL construction consists of two layers of geosynthetics needle-punched together sandwiching a layer of bentonite. A polymer membrane can also be attached to the GCL.

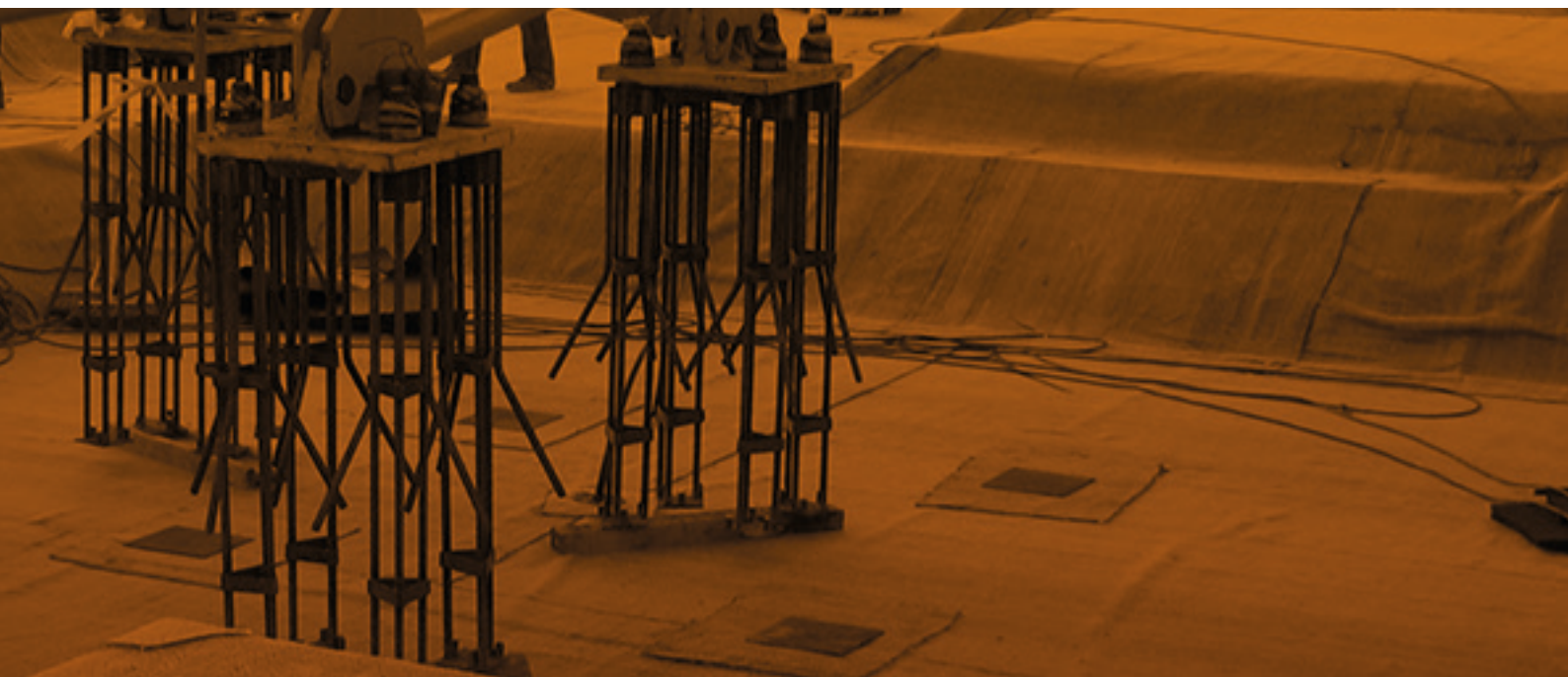


Thanks to the high standards of its products and the professional service, Eurobent has earned the trust and respect of the largest GCL consumers in the European market and beyond. At the same time, thanks to many years of experience in the field of geosynthetics production, the company has been able to develop invaluable knowledge in the production of bentonite mats, which has enabled Eurobent to become an innovative and acknowledged competitor on the international market.

A company is built by talented people committed to provide the best service and products available on the international marketplace.

Eurobent's laboratory technicians constantly undertake numerous tests on our products to ensure that their high standards are constantly maintained.

Eurobent is committed to constantly review the service we provide. The company aims to provide the highest quality product and also ensure that it would be manufactured, stored and transported in the way to minimize the negative impact on the environment. The customers can be sure that they purchase an environmentally friendly product from a company that is committed to environmental protection.



7. Labelling, delivery & storage, handling

7.1. Labelling

The GCL is labeled according to EN ISO 10320 for easy identification after unloading and during installation. Each roll shall be marked with the following information:

1. Manufacturer's name
2. Product identification
3. Roll number



7.2. Delivery & storage

EUROBENT is usually provided in rolls with a width of 5,1 m and a length of 40 m. Rolls can be also offered in other dimensions, depending on customer needs. The range of possible widths is 1 m to 5.1 m, and they can have the length specified by the customer. Average roll diameter is approximately 60 cm, and the weight is approximately 1000 kg. Eurobent GCL rolls are wound on tubes with an inner diameter of 10 cm. Every roll is packed in a plastic, UV resistant sleeve. All rolls are marked with a label containing the information about dimensions, lot and a unique, traceable roll number.

We supply a 20 kg bag of bentonite powder for each roll of Eurobent GCL. For rolls with prefabricated overlaps we supply one bag to every 3 rolls. The bag is meant for application in the overlapping areas.

Each roll is equipped with a set of two lifting straps. It is recommended to put a steel core inside the roll while unloading material from the truck to prevent bending of the roll.

While storing Eurobent rolls do not place them directly on the ground but on pallets or similar constructions underneath. Rolls should not be stacked in more than 4 rolls high.

Eurobent rolls should not be directly exposed to the bad weather conditions during the storage. All rolls shall be covered with a plastic sheet or a tarpaulin. Do not remove the plastic sleeves prior to installation.

7.3. Handling

The CQA inspector shall verify whether handling equipment does not pose any danger to installation personnel or risk of damage/deformation to the liner material itself. Suitable handling equipment is described below:

- 1. Spreader Bar Assembly** - A spreader bar assembly shall include both a core pipe or bar and a spreader bar beam. The core pipe shall be used to uniformly support the roll when inserted through the GCL core while the spreader bar beam will prevent chains or straps from chafing the roll edges.
- 2. Stinger** - A stinger is a rigid pipe or rod with one end directly connected to a forklift or other handling equipment. If a stinger is used, it should be fully inserted into the roll to prevent excessive bending of the roll when lifted.
- 3. Straps** - A properly structured and supported pole or “carpet puller” can be used to unload GCL rolls on site. As an alternative, straps that are appropriately rated and located across the roll can be used as an approved lifting method to unload GCL rolls.

8. After delivery inspection

1. Each roll shall be visually inspected when unloaded to determine if any packaging or material has been damaged during transit.
2. Repairs to damaged GCL shall be performed in accordance with installation manual:
 - a. Minor rips or tears in the plastic packaging shall be repaired with moisture resistant gluing tape prior to being placed in storage to prevent moisture damage.
 - b. Rolls with visible damage shall be marked and set aside for closer examination during deployment
 - c. GCL rolls delivered to the project site shall be only those indicated on GCL manufacturing Internal Test Reports (ITR).
 - d. In case of GCL, the presence of water in the package requires the removal of water from the roll package and closer examination before the deployment.
3. Preserve integrity and readability of roll labels.



9. Warranty

1. Material shall be warranted against Manufacturer's defects for a period of 25 years from the date of purchase.
2. Installation shall be warranted against defects in workmanship for a period of 1 year from the date of liner completion.

10. Product & Quality

Our products are developed according to customer requirements and design specifications, while complying with EN 13361:2004/A1:2006, EN 13362:2005, EN 13491:2004/A1:2006, EN 13492:2004/A1:2006, EN 13493:2005, EN ISO 13967:2012, EN 15382:2013.

For customers who work in markets that require special regulations, Eurobent offer products certified by their regional chambers. In case of not having such certificates, Eurobent proceeds to obtain them. In this way, our products are approved for sale and use throughout the world, and guarantee the highest quality in accordance with the requirements of individual markets.

Eurobent only works with the best and proven raw material suppliers. Vendors are certified and are leading manufacturers in their industry. The delivery control system in accordance with the Quality Book and ISO requirements ensures that our products are manufactured from the best components available on the market.

Geosynthetic clay liners (GCL) manufactured by Eurobent guarantee the highest quality and specification compliance through the manufacturing process and selection of the highest quality components.

GCL is a layer of self-sealing and self-healing bentonite encapsulated between a minimum of two layers of geotextiles.

The primary product consists of a carrier layer on which a layer of bentonite is applied and then covered with an upper layer. The product is finished by a needling process that makes our GCL resistant to peeling, so that layers cannot separate from each other and blocks the bentonite displacement inside the mat. This guarantees an even distribution of bentonite on the entire surface of the GCL, so its waterproofing properties are the same on the entire protected surface.



Depending on project requirements and specifications, Eurobent use different combinations of geotextiles in production. From the simplest GCL consisting of a woven in the carrier layer and a non-woven in the cover layer, to products based on non-woven in both layers, to the most durable products based on multi-layer composites in the carrier layer.

The amount of bentonite used in the production of our GCLs is selected for the required waterproofing properties, or customized to meet customer needs. For projects demanding complete waterproofing, our GCLs are offered with an additional geomembrane layer.

Overlap Markings – a minimum overlap guideline and a construction match-line delineating the overlap zone shall be imprinted on both edges of the GCL panel to ensure the accuracy of the seam. These lines shall be used during CQA to ensure the minimum overlap is achieved. The minimum overlap guideline shall indicate where the edge of the panel must be placed in order to achieve the correct overlap for each panel.

10.1. Materials

1. Acceptable Products:

- a. EUROBENT GCL (GCL / C / CS / NW / Compo / TL / P / QS)
- b. Engineer approved alternative

2. Alternative Materials:

- a. Prior to considering an alternative GCL material, the Contractor shall submit certified test results and statements of quality from the proposed GCL supplier to the engineer, indicating without exception that the proposed GCL meets the requirements of this specification. Submittals shall be delivered to the engineer in a minimum of five business days in advance of the bid.



11. GCL Properties

The GCL material shall be in accordance with the test methods, test frequencies and material physical properties as listed in the following data sheets.

EUROBENT 5000 & EUROBENT CS 0,2 (5000) will be used as the examples:

11.1. Eurobent 5000

TECHNICAL DATA SHEET		
EUROBENT 5000		
Mechanically bonded composite, consisting of granulated bentonite, embedded and fixed between two layers of geo-textile.		
Properties of geotextile	Test Method	Value
Carrier Layer - PP Woven	EN ISO 9864	100 g/m ²
Cover Layer - PP Nonwoven	EN ISO 9864	200 g/m ²
Properties of bentonite	Test Method	Value
Montmorillonite Content	CUR 33	≥ 75%
Swell Index	ASTM D 5890	≥ 24 ml/2 g
Properties of GCL	Test Method	Value
Mass per unit area of bentonite ⁽¹⁾	EN 14196	5000 g/m ²
Mass per unit area of GCL ⁽¹⁾	EN 14196	5300 g/m ² (-200g/m ²)
Thickness	EN ISO 9863-1/9863-2	7,4 mm (±1mm)
Index Flux	ASTM D 5887	≤ 5,0 x 10 ⁻⁹ m ³ /m ² /s
Permeability	ASTM D 5887	≤ 5,0 x 10 ⁻¹¹ m/s
Tensile Strength MD	EN ISO 10319	10,4 kN/m (-1kN/m)
Tensile Strength CMD	EN ISO 10319	8,5 kN/m (-0,8kN/m)
CBR Puncture Strength	EN ISO 12236	1,8 kN (-0,2kN)
Standard Roll Dimensions	Test Method	Value
Width x Length	Typical	5,1 m x 40 m (±1%)
Quantity	Typical	204 m ²

1. At 12% moisture content
2. Max Peak

These data are average values derived from standard tests and are subject to usual product variation. The right is reserved to make changes without notice at any time.

11.2. Eurobent CS 0,2 (5000)

TECHNICAL DATA SHEET		
EUROBENT CS 0,2 (5000)		
Mechanically bonded composite, consisting of granulated natural sodic bentonite, embedded and fixed between two layers of geo-textile and glued to a PE membrane (type A in accordance with EN 13967+A1:2012).		
Properties of geotextile	Test Method	Value
Carrier Layer - PP Woven	EN ISO 9864	100 g/m ²
Cover Layer - PP Nonwoven	EN ISO 9864	200 g/m ²
Properties of Membrane	Test Method	Value
PE Membrane	PN EN 1849-2	0,2 mm
Watertightness	EN 1928	Pass
Properties of bentonite	Test Method	Value
Montmorillonite Content	CUR 33	≥ 75%
Swell Index	ASTM D 5890	≥ 24 ml/2g
Properties of GCL	Test Method	Value
Mass per unit area of bentonite ⁽¹⁾	EN 14196	5000 g/m ²
Mass per unit area of GCL ⁽¹⁾	EN 14196	5500 g/m ² (-200g/m ²)
Thickness	EN ISO 9863-1	7,6 mm (±1mm)
Index Flux	ASTM D 5887	IMPERMEABLE
Permeability	ASTM D 5887	IMPERMEABLE
Tensile Strength MD	EN ISO 10319	10,4 kN/m (-1kN/m)
Tensile Strength CMD	EN ISO 10319	10,4 kN/m (-1kN/m)
CBR Puncture Strength	EN ISO 12236	1,8 kN (-0,2kN)
Standard Roll Dimensions	Test Method	Value
Width x Length	Typical	5,1 x 40 m (±1%)
Quantity	Typical	204 m ²

1. At 12% moisture content
2. Max Peak

These data are average values derived from standard tests and are subject to usual product variation. The right is reserved to make changes without notice at any time.

12. Minimum frequency of controls and tests of GCL

Minimum inspection and testing frequency for
bentonite polymerized geosynthetic insulation GBR - C^R EUROBENT®

Line	Test	Task	Frequency	Harmonised norm
1	Compliance with the order from client	Inspection of the finished product for compliance with the order	Every roll	
2	Marking	Checking transparency and indelibility of symbol GBR-C EUROBENT® in accordance to PN EN ISO 10320	Every roll	
3	Visual inspection	Packaging integrity, physical appearance, cleanness	Every roll	
4	Unit surface weight	Assesment of conformity to technical specifications	1 x 20 000 m ²	PN EN ISO 14196
5	Thickness	Assesment of conformity to technical specifications	1 x 20 000 m ²	PN EN ISO 9863-1 / 9863-2
6	Moisture Content	Assesment of conformity to technical specifications	1 x 20 000 m ²	DIN 18121-1 / 18121-2
7	Tensile Strength	Assesment of conformity to technical specifications	1 x 20 000 m ²	PN EN ISO 10319
8	Elongation at break	Assesment of conformity to technical specifications	1 x 20 000 m ²	PN EN ISO 10319
9	Static Puncture Resistance (CBR)	Assesment of conformity to technical specifications	1 x 20 000 m ²	PN EN ISO 12236
10	Index Flux + Water permeability	Assesment of conformity to technical specifications	1 x month	ASTM D 5887 EN 16416
11	Oxidation	Assesment of conformity to technical specifications from suppliers of woven an nonwoven	Each delivery	EN ISO 13438



13. Minimum frequency of controls and tests of GCL CS

Minimum inspection and testing frequency for
bentonite polymerized geosynthetic insulation GBR - C^R CS^R EUROBENT®

Line	Test	Task	Frequency	Harmonised norm
1	Compliance with the order from client	Inspection of the finished product for compliance with the order	Every roll	
2	Control of the marking	Checking transparency and indelibility of symbol GBR-C EUROBENT® in accordance to PN EN ISO 10320	Every roll	
3	Visual inspection	Packaging integrity, physical appearance, cleanness	Every roll	
4	Unit surface weight	Assesment of conformity to technical specifications	1 x 20 000 m ²	PN EN ISO 14196
5	Thickness	Assesment of conformity to technical specifications	1 x 20 000 m ²	PN EN ISO 9863-1 / 9863-2
6	Moisture Content	Assesment of conformity to technical specifications	1 x 20 000 m ²	DIN 18121-1/18121-2
7	Tensile Strength	Assesment of conformity to technical specifications	1 x 20 000 m ²	PN EN ISO 10319
8	Elongation at break	Assesment of conformity to technical specifications	1 x 20 000 m ²	PN EN ISO 10319
9	Static Puncture Resistance (CBR)	Assesment of conformity to technical specifications	1 x 20 000 m ²	PN EN ISO 12236
10	Index Flux + Water permeability Liquid impermeability	Assesment of conformity to technical specifications	- 1 x year - For verification purposes upon request, additional external inspection at a certified external LAB	ASTM D 5887 EN 16416
11	Reaction to fire	Assesment of conformity to technical specifications	Assesment of conformity to technical specifications from suppliers of geomembrane	EN 13501-1
12	Watertightness	Assesment of conformity to technical specifications	- 1 x year - For verification purposes upon request, additional external inspection at a certified external LAB	EN 1928
13	Dangerous substances	Assesment of conformity to technical specifications	- Assesment of conformity to technical specifications from suppliers of geomembrane	EN 13967

14. Installation

14.1. Subgrade Preparation

When installing EUROBENT GCL over a soil subgrade, the finished surface should be smooth without any abrupt elevation changes, voids, cracks, ice, or standing water. In addition it should be firm, and compacted to a required degree so that deployment or other construction equipment does not leave tracks or ruts greater than 25 mm in depth.

Surface on which you plan to install the EUROBENT GCL must be free of sharp rocks, organic matter and other objects larger than 50 mm. The subgrade should be compacted to at

least 90% of its proctor density. While compacting with a smooth-wheeled or rubber-tired roller, try to keep the surface free of water. The GCL may be installed on a frozen subgrade, however only if the subgrade soil in the unfrozen state meets the requirements listed above.

Notwithstanding the above requirements, the subgrade surface must also be prepared in strict accordance with the project drawings and specifications, and the engineer's approval of the subgrade must be obtained prior to material deployment.



14.2. Installation of EUROBENT GCL

EUROBENT GCL rolls should be transported to the deployment area in their original packaging. The positioning of the GCL (i.e., which side faces up) may be important if the GCL has differing types of geotextiles/geosynthetics. Always check with the project engineer in order to determine if there is a preferred installation positioning for the GCL. If no specific orientation is required, unwind the roll from the bottom instead of pulling the flap from the top. Take care in removing the packaging so as not to damage the rolls. The GCL rolls should

not be allowed to unroll freely down the slope.

Equipment which could damage the GCL should not be allowed to move directly on it. Allowable equipment which may be utilized on the GCL is limited to lightweight ATVs with a maximum bearing capacity of 5psi (21.5 kPa). Care should always be taken in the operation of any equipment on the GCL so as to avoid sudden starts and stops, abrupt turns, or other manoeuvres that could damage the GCL.

To minimize traffic on the EUROBENT GCL, installation may be accomplished by unrolling the GCL in front of a vehicle moving backwards. Any rutting or other damage to the subgrade must be repaired prior to the continued placement of the GCL or other material. Alternatively, if sufficient access is available, the GCL roll may be deployed by suspending it from a spreader bar at the top of the slope and using a group of labourers and equipment to spool the material off of the roll and pull it down the slope.

Regardless of the deployment method, care must be taken to minimize the extent to which the roll is dragged across the subgrade or other surface in order to prevent damage to the GCL. Care must also be taken when adjusting the GCL panels to avoid damage to the geotextile surface by the subgrade or another adjacent geosynthetic material such as a textured geomembrane. A temporary geosynthetic/geomembrane sheet, commonly known as a slip sheet or rub sheet, may be used to prevent or reduce friction damage during placement.

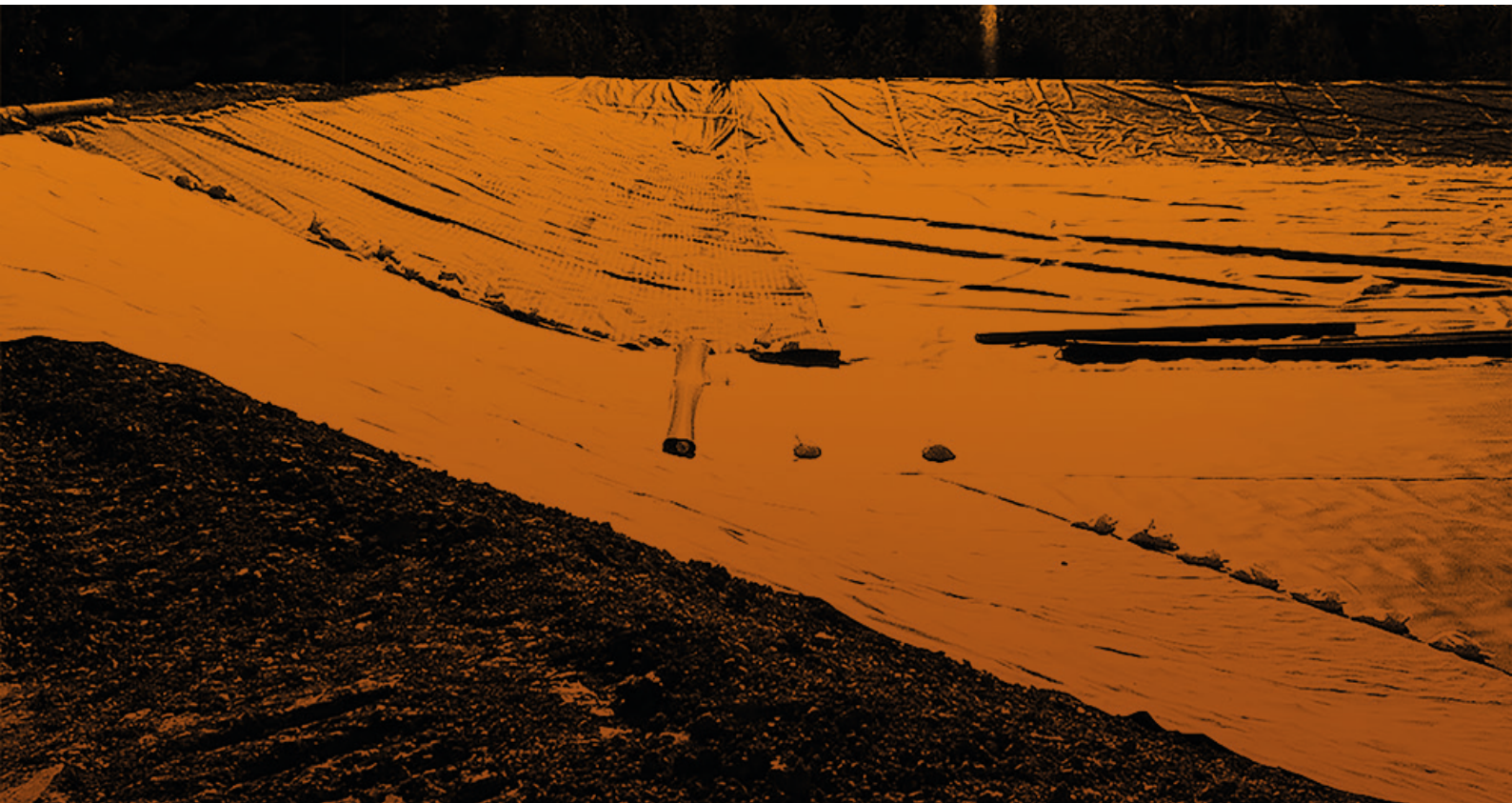
EUROBENT GCL shall be placed in a way that longitudinal joints are parallel to the slope direction.

End seams should also be located in a minimum of 1 m from the toe and crest of any slopes steeper than 4H:1V. End seams on slopes should be used only if the liner is not expected to be in tension and interface friction testing confirms this.

EUROBENT GCL should be placed to lie flat, without any folds, especially at the uncovered edges.

Panels should not be installed in standing water or during rain. To ensure proper GCL performance, panels shall be covered with soil, geomembrane or other cover layer at the end of the working day.

If EUROBENT GCL gets in contact with water without confining stress, it may be necessary to remove and replace the hydrated material. The decision shall be taken by the CQA engineer. Eurobent recommends that premature hydration is evaluated on a case-by-case basis. The project engineer or CQA inspector should be consulted for specific guidance if premature hydration occurs. The type of GCL, duration of exposure, degree of hydration, location in the lining system and expected bearing loads should be considered.





14.3. Anchor Trench

Before installing the EUROBENT around the pipe, clear an area of 15 - 20 cm deep and 30 cm around from surrounding soil. Pack this area up to half its total depth with bentonite powder or EUROPASTE and place the GCL that is to be cut in star shape to fit around the pipe on top. Then fill the rest of the excavated area with bentonite powder and place another GCL sheet cut in star shape on top of it. To hold the second bentonite liner firmly in place it is recommended to attach it with a pipe shell.

Attachments to concrete structure should end above the ground water level. In the attachment area dig a small trench along the structure to be sealed. Pack it with bentonite powder or EUROPASTE up to half of its total depth. Then trim the bentonite liner to fit against the wall of the structure and fill the remaining trench with bentonite powder. For additional anchorage it is recommended to fix a plastic or metal strip along the edge and cover this area with a piece of bentonite liner or a piece of woven.

14.4. Damage Repair

Even if installation is carried out with utmost care the liner may be exposed to some damage in the process. Due to the swelling properties of the bentonite minor defects will heal and seal themselves. More serious defects should be marked immediately and repaired by cutting a patch of EUROBENT GCL that is large enough to allow an overlap of at least 30 cm on all edges. Place the bentonite powder on the repaired area and cover it with the patch.

Depending on site conditions, it may be necessary to use an adhesive to fix the patch in place to prevent displacement during cover placement. Smaller patches may be tucked under the damaged area to prevent patch movement.

14.5. Cover Placement

Cover material should be placed on the bentonite liner immediately after installation. Soil cover shall be placed over the GCL using only construction equipment that minimizes stresses on the GCL. A minimum thickness of 300 mm of cover material should be maintained between any equipment tires/tracks and the GCL at all times. In areas of high-traffic or roadways, a minimum thickness of 600 mm is required. Soil cover should be placed in a manner that prevents the soil from entering the GCL seams.

The soil cover should always be moved upslope rather than downslope to minimize tensile forces on the GCL.

14.6. Hydration

Generally hydration of the EUROBENT GCL will be required in order for the material to perform properly as a barrier layer and reach its full potential. It is very important that hydration occurs in the presence of a confining stress. The confining stress is most often provided through the use of a minimum of 300 mm of cover soil. It is not recommended to hydrate the GCL before covering it with the soil as the swollen bentonite may be displaced under the pressure of heavy equipment.

Hydration is typically accomplished naturally by rainfall and/or the absorption of moisture from the soil. However, in cases where the containment of non-aqueous liquid is required, it may be necessary to manually hydrate the covered GCL prior to use. If such manual hydration is necessary, water may be introduced to the GCL by flooding the covered lined area or by using a sprinkler system, irrigation system or other method of applying the water for hydration.





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