ENVIRONMENTAL PRODUCT DECLARATION

in accordance with */ISO 14025/* and */EN 15804+A2/*

Owner of the declaration	TenCate Geosynthetics
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-TNC-20200161-CBD1-EN
Issue date	20/01/2021
Valid to	19/01/2026

TenCate Polyfelt® non-woven fabric and
TenCate Bidim® non-woven fabric
Continuous filament non-woven spunbonded polypropylene

TenCate Geosynthetics

Institut Bauen und Umwelt e.V.

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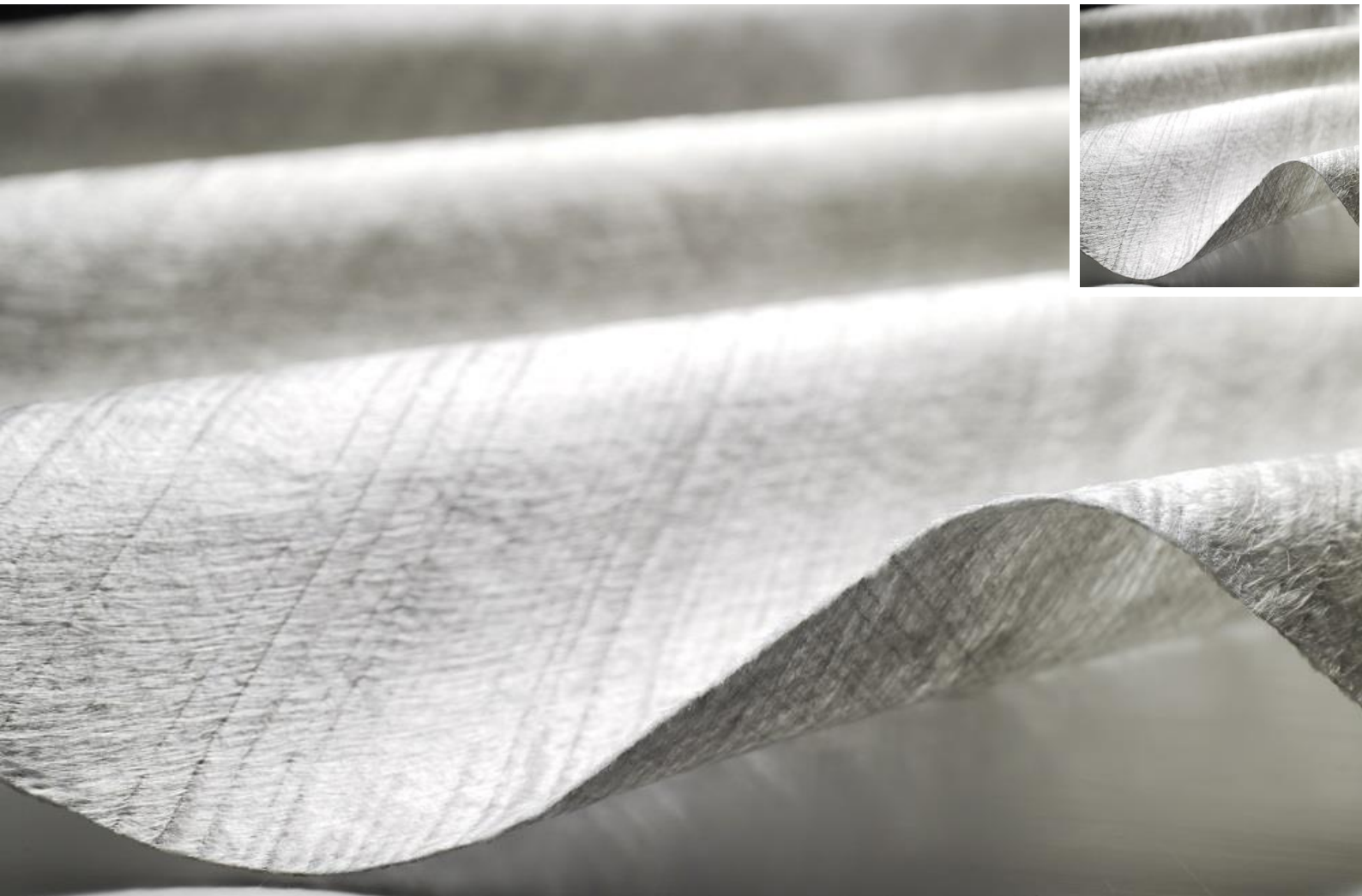

General Information

TenCate Geosynthetics

TenCate Polyfelt® non-woven fabric and TenCate Bidim® non-woven fabric

Programme holder
IBU – Institut Bauen und Umwelt e.V.
Panoramastrasse 1
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Owner of the declaration
TenCate Geosynthetics Austria GmbH
Schachermayerstrasse 18
4021 Linz
Austria

Declaration number
EPD-TNC-20200161-CBD1-EN

Declared product/declared unit
1 m^2 TenCate Geotextile

This declaration is based on the following product category rules:
Technical Textiles, 07/2014
(PCR tested and approved by the independent advisory board (SVR))

Scope of application:
This declaration applies to Tencate Geosynthetics' TenCate Polyfelt® non-woven fabric and TenCate Bidim® non-woven fabric (geotextiles). These products are manufactured in TenCate Geosynthetics' Bezons works in France and in their Linz works in Austria. The underlying EPD is based on the background report which has been compiled for the declared product.

Issue date
20/01/2021

Valid to
19/01/2026

The owner of the declaration is liable for the basic information and supporting evidence; any liability of the IBU in relation to manufacturer's information, LCA data and supporting evidence is excluded. This document is a translation from German to English. It is based on the original declaration number EPD-TNC-20200161-CBD1-DE.

This EPD was compiled in accordance with the requirements of *EN 15804+A2*. This standard is described in simplified form as */EN 15804/* in the following.

Verification

European standard */EN 15804/* serves as the core PCR
Independent verification of the declaration and statements by an independent body in accordance with */ISO 14025:2010/*
☐ internal ☒ external

Dipl. Ing. Hans Peters
(President of Institut Bauen und Umwelt e.V.)

Dr. Alexander Röder
(Executive Director Institut Bauen und Umwelt e.V.)

Dr. Eva Schmincke,
Independent verifier

Product

Company information
TenCate develops and produces geosynthetics for a wide variety of fields of application in modern civil engineering.

Product description/Product definition
This TenCate geotextile is continuous filament non-woven spunbonded polypropylene. The moulding compound, which is provided with stabilisers, is continuously melted in a melt spinning process, extruded and spun into continuous filaments. The discarded continuous filaments are then mechanically bonded, stretched to the required width (patented) and rolled up.

EU regulation no. /305/2011/ (CPR) applies for putting the product on the market in the EU/EFTA (with the exception of Switzerland). This product requires a declaration of performance taking into account the following standards relating to required characteristics for geotextiles and CE labelling.

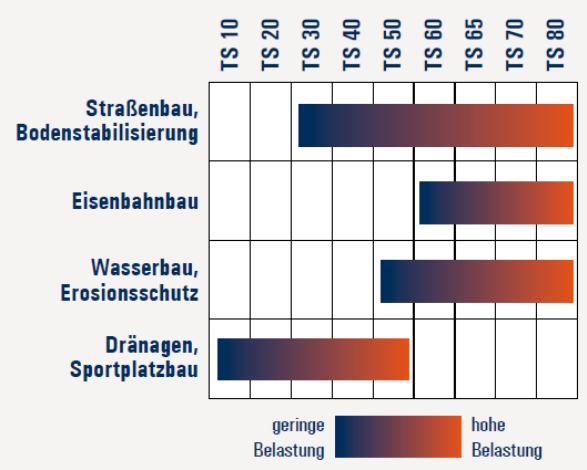
/EN 13249:2016/ Roads and other trafficked areas (excluding railways and asphalt inclusion)

/EN 13250: 2016/ Railways
/EN 13251:2016/ Earthworks, foundations and retaining structures
/EN 13252: 2016/ Drainage systems
/EN 13253:2016/ Erosion control works (coastal protection, bank revetments)
/EN 13254:2016/ Reservoirs and dams
/EN 13255: 2016/ Canals
/EN 13256:2016/ Tunnels and underground structures
/EN 13257:2016/ Solid waste disposal sites
/EN 13265:2016/ Liquid waste containment projects

The respective national regulations apply to use.

Application
The declared product is used in the geotechnical and structural engineering fields. Its functions are separation, filtration, drainage and protection. The mixing of different soils and/or fill materials is permanently prevented by the use of geotextiles. Uncontrolled migration of particles or extraneous material with the simultaneous passage of fluids is prevented which means an optimum filter effect. This geotextile is also used as a protective material for certain elements such as geomembranes and protects it against mechanical damage.

TenCate geotextilies are available in various brands and versions which are all presented on TenCate's website. TenCate Polyfelt TS, which is offered in nine different grades (TS 10, TS 20, TS 30, TS 40, TS 50, TS 60, TS 65, TS 70, TS 80), is one example of a TenCate geotextile. The products are used in the different areas shown in the illustration below.



Technical data

Constructional data

Name	Value	Unit
Linear yarn density (/DIN ISO 2060/)	7 - 12	dtex
Static puncture strength (/EN ISO 12236/)	700 - 14000	N
Cone drop test (hole diameter) (/EN ISO 13433/)	0 - 50	mm
Opening width O90 (EN ISO 12956)	60 - 260	µm
Water permeability (vertical; delta h 50 mm) (/EN ISO 11058/)	10 - 250	l/m²s (mm/s)
Thickness (2kPa) (/EN ISO 9863- 1/)	0.6 - 9.0	mm
Mass per unit of area (/EN ISO 9864/)	70 - 1200	g/m²
Tensile strength (longitudinal) (/EN ISO 10319/)	4 - 100	kN/m
Tensile strength (lateral) (/EN ISO 10319/)	4 - 100	kN/m
Extension under nominal load (longitudinal) (/EN ISO 10319/)	50- 150	%
Extension under nominal load (lateral) (/EN ISO 10319/)	20 -180	%
Weather resistance (/EN 12224/)	1 month outdoor storage	
Durability (/EN 13249/ ff. Appendix B)	More than 100 years in soils with a pH value > 4 and < 9 and a soil temperature < 25° C	

The product's performance values comply with the declaration of performance in relation to its main features in accordance with the following European standards:

/EN 13249:2016/ Roads and other trafficked areas (excluding railways and asphalt inclusion)
/EN 13250: 2016/ Railways
/EN 13251:2016/ Earthworks, foundations and retaining structures
/EN 13252: 2016/ Drainage systems
/EN 13253:2016/ Erosion control works (coastal protection, bank revetments)
/EN 13254:2016/ Reservoirs and dams
/EN 13255: 2016/ Canals
/EN 13256:2016/ Tunnels and underground structures
/EN 13257:2016/ Solid waste disposal sites
/EN 13265:2016/ Liquid waste containment projects

Base materials/ancillary materials
The declared product consists of 100% polypropylene and is treated with a UV stabiliser and a colourant.

Does the product contain more than a 0.1% concentration of any substance which is on the ECHA candidate list: No.

Reference period of use
A designated period of use of 100 years can be assumed when using geosynthetics.

LCA: Calculation rules

Declared unit
The declared unit is 1 m² of geotextile. Its mass per unit of area in accordance with */EN ISO 9864/ is* 0.07 to 1.3 kg/m². A surface weight of 0.195 kg/m² has been used when calculating the lifecycle analysis for this EPD.

Declared unit

Name	Value	Unit
Conversion factor [mass/declared unit]	0.195	-
Declared unit	1	m^2
Mass per unit of area	0.195	kg/m^2
Surface weight	1	kg/m^2
Conversion factor to 1 kg	1	
Bulk density	1	kg/m^3

System boundary
The type of EPD according to lifecycle phases included is a cradle to factory gate view with Modules A1-A3, C1-C4 and Module D.
The lifecycle phases and process modules included for the manufacture of TenCate geotextiles are listed in detail in the following:

A1-A3:

- Production of raw, auxiliary and operating materials including transport to the works
- Production of packaging materials for the end product including transport to the works
- Water and steam consumption
- Energy provision for production
- Internal transports (within a company site and between TenCate production locations)
- Production of packaging materials for raw materials including transport to recycling with subsequent recycling
- Transport of production waste to recycling including recycling

C1 – C4:

- Removal of the geosynthetic with a digger
- Transport to recycling
- Disposal in landfill
- The waste treatment module (C3) is not relevant as geosynthetics are not subjected to waste treatment.

D:

- Reuse, recovery and recycling potential

Comparability
In principle, a comparison or the evaluation of EPD data is only possible if all data to be compared was compiled in accordance with */EN 15804/* and the building context or product-specific performance characteristics have been included.

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LCA: Scenarios and further technical information

Characteristic product properties
Biogenic carbon
The biogenic carbon content quantifies the amount of biogenic carbon in a building product which leaves the factory gate. The total mass of biogenic carbon materials is less than 5 % of the total mass of the product and the associated packaging.

The following technical information is the basis for the declared modules or can be used for the development of specific scenarios in the context of a building assessment. Undeclared modules are labelled with the abbreviation MND (Module Not Declared).

End-of-life (C1-C4)

Name	Value	Unit
Separately collected non-hazardous waste for disposal in landfill	0.195	kg
As mixed building waste	0	kg
For reuse	0	kg
To recycling	0	kg
For energy recovery	0	kg
To landfill	0.195	kg

Reuse, recovery and recycling potential (D), relevant scenario information

The declared product is disposed of in landfill insofar as it is not left in the ground. The impacts of landfill disposal which accrue are already recorded in Module C4. There is no reuse, recovery and recycling potential due to the type of recycling so that no credits are generated.

LCA: Results

The results of the impact assessment for TenCate geotextiles can be seen in the following table. The impact categories according to /*EN 15804 +A2*/ were used as a basis for calculation.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED; MNR = MODULE NOT RELEVANT)

Production stage			Construction process stage		Use stage							End of life stage				Credits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use/application	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/demolition	Transport	Waste processing	Disposal	Reuse, recovery or recycling potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	ND	ND	ND	ND	MNR	MNR	MNR	ND	ND	X	X	X	X	X

RESULTS OF THE LCA – ENVIRONMENTAL IMPACT in accordance with EN 15804+A2: 1 m² geotextile

Core indicator	Unit	A1-A3	C1	C2	C3	C4	D
Global warming potential - total	[kg CO_2 eq.]	3.93E-1	3.35E-2	5.59E-4	0.00E+0	1.30E-2	0.00E+0
Global warming potential - fossil	[kg CO_2 eq.]	3.96E-1	3.32E-2	5.61E-4	0.00E+0	1.34E-2	0.00E+0
Global warming potential - biogenic	[kg CO_2 eq.]	-2.99E-3	-2.55E-5	-6.90E-6	0.00E+0	-4.07E-4	0.00E+0
Global warming potential - luluc	[kg CO_2 eq.]	2.58E-4	2.66E-4	5.53E-6	0.00E+0	1.09E-5	0.00E+0
Depletion potential of the stratospheric ozone layer	[kg CFC11 eq.]	3.83E-10	3.95E-18	9.71E-20	0.00E+0	3.04E-17	0.00E+0
Acidification potential, accumulated exceedance	[mol H^+ eq.]	1.23E-3	4.42E-4	1.20E-6	0.00E+0	4.06E-5	0.00E+0
Eutrophication potential - fresh water	[kg PO_4 eq.]	1.15E-5	9.98E-8	2.72E-9	0.00E+0	2.45E-6	0.00E+0
Eutrophication potential - salt water	[kg N eq.]	2.73E-4	1.99E-4	4.72E-7	0.00E+0	9.01E-6	0.00E+0
Eutrophication potential, accumulated exceedance	[mol N eq.]	2.93E-3	2.19E-3	5.46E-6	0.00E+0	9.89E-5	0.00E+0
Formation potential for tropospheric ozone photochemical oxidants	[kg NMVOC eq.]	1.19E-3	6.46E-4	1.01E-6	0.00E+0	2.93E-5	0.00E+0
Abiotic depletion potential for non-fossil resources	[kg Sb eq.]	1.09E-7	2.35E-9	4.86E-11	0.00E+0	9.04E-10	0.00E+0
Abiotic depletion potential for fossil resources	[MJ]	2.44E+1	4.37E-1	7.37E-3	0.00E+0	1.92E-1	0.00E+0
Water extraction potential (user)	[m^3 world eq. extracted]	3.00E-1	2.93E-4	6.76E-6	0.00E+0	-1.50E-4	0.00E+0

RESULTS OF THE LCA – INDICATORS TO DESCRIBE THE USE OF RESOURCES in accordance with EN 15804+A2: 1 m² geotextile

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier	[MJ]	1.23E+0	2.46E-2	5.05E-4	0.00E+0	1.35E-2	0.00E+0
Renewable primary energy resources as material utilisation	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total use of renewable primary energy resources	[MJ]	1.23E+0	2.46E-2	5.05E-4	0.00E+0	1.35E-2	0.00E+0
Non-renewable primary energy as energy carrier	[MJ]	1.64E+1	4.38E-1	7.41E-3	0.00E+0	1.92E-1	0.00E+0
Non-renewable primary energy resources as material utilisation	[MJ]	8.05E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total use of non-renewable primary energy resources	[MJ]	2.44E+1	4.38E-1	7.41E-3	0.00E+0	1.92E-1	0.00E+0
Use of secondary materials	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of non-renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Net use of freshwater resources	[m^3]	7.93E-3	2.84E-5	7.09E-7	0.00E+0	2.36E-6	0.00E+0

RESULTS OF THE LCA: WASTE CATEGORIES AND OUTPUT FLOWS in accordance with EN 15804+A2: 1 m² geotextile

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposal	[kg]	6.79E-9	2.04E-8	6.11E-10	0.00E+0	7.02E-10	0.00E+0
Non-hazardous waste disposal	[kg]	1.99E-3	6.70E-5	1.36E-6	0.00E+0	1.84E-1	0.00E+0
Radioactive waste disposal	[kg]	5.58E-4	5.42E-7	2.38E-8	0.00E+0	2.32E-6	0.00E+0
Components for reuse	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	[kg]	8.34E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported electrical energy	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported thermal energy	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

RESULTS OF THE LCA – additional impact categories in accordance with EN 15804+A2-optional: 1 m² geotextile

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Potential occurrence of illness due to particulate emissions	[Cases of illness]	1.37E-8	1.78E-8	6.86E-12	0.00E+0	3.96E-10	0.00E+0
Potential impact through exposure of humans to U235	[kBq U235 eq.]	1.47E-1	7.83E-5	2.03E-6	0.00E+0	3.29E-4	0.00E+0
Potential toxicity comparison unit for ecosystems	[CTUe]	3.77E+0	3.10E-1	5.56E-3	0.00E+0	1.89E-1	0.00E+0
Potential toxicity comparison unit for humans - carcinogenic effect	[CTUh]	8.55E-11	6.47E-12	1.15E-13	0.00E+0	8.56E-12	0.00E+0
Potential toxicity comparison unit for humans - non-carcinogenic effect	[CTUh]	2.99E-9	6.11E-10	6.13E-12	0.00E+0	6.88E-10	0.00E+0
Potential soil quality index	[-]	1.93E+0	1.53E-1	2.60E-3	0.00E+0	1.35E-2	0.00E+0

Restriction notice 1 – applies to the IRP indicator
This effect category mainly deals with the possible effect of low-dose ionising radiation on human health in the nuclear cycle. It takes into account neither impacts which are attributable to possible nuclear accidents and occupational exposure nor the disposal of radioactive waste in underground facilities. The potential ionising radiation emanating from the soil, from radon and from some building materials is also not measured by this indicator.

Restriction notice 2 – applies to the indicators ADPE, ADPF, WDP, ETP-fw, HTP-c, HTP-nc, SQP
The results of this environmental impact category must be applied with care as uncertainties with these results are high or because there is a lack of experience with the indicator.

References

Standards

/EN 15804/
/DIN EN 15804:2019-04+A2/, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.

/ISO 14025/
/DIN EN ISO 14025:2011-10/, Environmental labels and declarations – Type III Environmental declarations – Principles and procedures.

/EN 13249/
/DIN EN 13249:2016-12/, Geotextiles and geotextile-related products - Characteristics required for use in the construction of roads and other trafficked areas (excluding railways and asphalt inclusion).

/EN 13250/
/DIN EN 13250:2016-12/, Geotextiles and geotextile-related products - Characteristics required for use in the construction of railways.

/EN 13251/
/DIN EN 13251:2016-12/, Geotextiles and geotextile-related products - Characteristics required for use in earthworks, foundations and retaining structures.

/EN 13252/
/DIN EN 13252:2016-12/, Geotextiles and geotextile-related products - Characteristics required for use in drainage systems.

/EN 13253/
/DIN EN 13253:2016-12/, Geotextiles and geotextile-related products - Characteristics required for use in erosion control works (coastal protection, bank revetments).

/EN 13254/
/DIN EN 13254:2016-12/, Geotextiles and geotextile-related products - Characteristics required for the use in the construction of reservoirs and dams.

/EN 13255/
/DIN EN 13255:2016-12/, Geotextiles and geotextile-related products - Characteristics required for use in the construction of canals.

/EN 13256/
DIN EN 13256:2016-12
Geotextiles and geotextile-related products - Characteristics required for use in the construction of tunnels and underground structures.

/EN 13257/
/DIN EN 13257:2016-12/, Geotextiles and geotextile-related products - Characteristics required for use in solid waste disposals.

/EN 13265/
/DIN EN 13265:2016-12/
Geotextiles and geotextile-related products - Characteristics required for use in liquid waste containment projects.

/ISO 9864/
DIN EN ISO 9864:2005-05, Geosynthetics - Test method for the determination of mass per unit area of geotextiles and geotextile-related products.

Further literature

/IBU 2016/
Institut Bauen und Umwelt e.V.: General EPD programme instructions from Institut Bauen und Umwelt e.V. (IBU). Version 1.1, Berlin: Institut Bauen und Umwelt e.V., 2016. http://www.ibu-epd.com

Software used

/GaBi ts/
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