

Environmental Product Declaration



In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

STUDED MEMBRANES

Membrana nera, Membrana nera Geo, T Kone, Tefond, HDD, TMD, MD



TeMa Technologies and Materials srl

Programme:	The International EPD® System, www environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-06571
Publication date:	2022-08-05
Valid until:	2027-08-01

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

GENERAL INFORMATION

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product category rules (PCR): PCR 2019:14 Construction Products, v1.11

PCR review was conducted by: The Technical Committee of the International EPD® System.
See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact

LCA accountability:

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Independent third-party verification of the declaration and data, according to ISO 14025:2006:

External Internal
covering
 EPD process certification EPD verification

Third party verifier:

SGS Italia S.p.A. via Caldera, 21, 20153 – Milano
T +39 02 73 931 - F +39 02 70 12 46 30 / www.it.sgs.com

Accredited by: Accredia, certification n.006H

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

COMPANY INFORMATION

Owner of the EPD:

TeMa Technologies and Materials srl
Via dell'industria 21
31029 Vittorio Veneto (TV) - Italy

Contact:

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Description of the organisation:

TeMa - short for "Technologies and Materials" - was established in 1993, standing out for its innovation-focused approach. TeMa has developed global experience to provide solutions that sit lightly in the landscape while offering high performance in terms of protection and reinforcement, maintenance and drainage in the residential and commercial building markets and in major environmental projects. Since 2013, we have also been doing research into the construction of interiors, developing new high-performance materials for waterproofing and

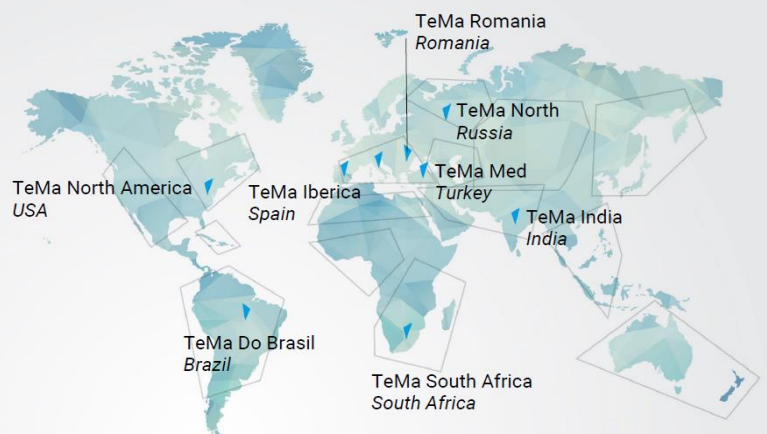
sound insulation. With a complete and articulated range of products and many other awaiting testing, we like to think of ourselves as a company whose constant innovation helps customers approach their target market with the latest tech and a never-ending stream of new solutions, also in response to direct feedback from technicians, designers and site operators. Since our inception, the path we have taken has allowed us to expand our sales offering by developing new products, making inroads into new markets and - last but not least - entering into significant business agreements with multinational companies.

These important strategic decisions have given TeMa a global reach, laying the groundwork for our internationalization. Hence our original Vittorio Veneto facility near Treviso in Italy has been joined, in succession, by: TeMa Iberica (Spain), TeMa North (Russia), TeMa Med (Turkey), TeMa Romania and TeMa North America (USA). With its sales network, TeMa is now present in 80 countries around the world.

IN THE GLOBE

OFFICES AND FACTORIES

Headquarter
TeMa
Vittorio Veneto - Italy



Product-related or management system-related certifications:

ISO 9001: 2015, Quality Management System certification (certificate n. IT04/0341, SGS Italia S.p.a)

Name and location of production site(s):

Via dell'industria, 21 – 31029, Vittorio Veneto (TV)

PRODUCT INFORMATION

Product name:

Membrana nera, Membrana nera Geo, T Kone, Tefond, HDD, TMD, MD

UN CPC code:

36950

Geographical scope:

Europe

Product description:

Studded membranes are based on a polymeric membrane that is shaped with a specific design of protrusions, that is typically a hollow truncated cone. They are applied both in buildings construction and in civil engineering or for environmental remediation.

Studded membranes are mainly used in foundations or below grade levels for:

- Mechanical protection for waterproofing, delivering long-term reliability and longevity.
- Damp-proofing, creating separation between the structure and the ground, which is inherently damp
- Water drainage, in order to reduce water loading on underground structures - both vertical and horizontal - in contact with the ground, and when dealing with water.

Some products can also be bonded with a single or a double non-woven geotextile.

Membrana nera

HDPE studded membrane, 8 mm thick, for foundation and underground structures, used for mechanical protection of waterproofing membranes. Based on the decreasing surface mass, there are subtypes Membrana nera, Membrana nera S and Membrana nera XS. Black membrane Star has a special dimple shape (star dimple).

Membrana nera Geo

HDPE studded membrane, 8mm thick, with one non-woven textile, used for mechanical protection of waterproofing and drainage

T Kone

HDPE studded membrane, 8 mm thick, for foundation and underground structures, used for mechanical protection of waterproofing membranes. Based on the decreasing surface mass, there are subtypes T Kone and T Kone S while T Kone G Drain is a HDPE studded membrane, 8mm thick, with one nonwoven textile, used for mechanical protection of waterproofing and drainage. T Kone Star has a special dimple shape (star dimple).



Installation of T KONE G DRAIN as drainage layer towards a wall

Tefond

HDPE studded membrane, 8 mm thick, for Foundation and underground structures, used for mechanical protection of waterproofing membranes. Tefond has a special mechanical locking system on the selvedge that allows side junctions among rolls. Tefond Star is a HDPE studded membrane, 8 mm thick, for foundation and underground structures, used for mechanical protection of waterproofing membranes. It has a special dimple shape (star dimple) and a mechanical locking system that allows side junction among rolls. Several types are available:

- "hp" version has higher surface mass compared to standard version
- "plus" version has an additional sealing strip within the locking system
- "drain" version is bonded to a geotextile to widen the field of application to drainage systems

TMD

HDPE studded membrane, 10mm thick, with a core weight of 850g/sqm and bonded to a geotextile to be used for mechanical protection of waterproofing and drainage in particular where heavy loads bearing and high drainage capacity

are requested. Available versions are 1011 and 1011 plus that also has a LDPE film on the backside.



Installation of TMD 1011 as water collection layer in an artificial tunnel

HDD

HDPE studded membrane, 10mm thick, with a core weight between 850 and 1150g/sqm and bonded to a geotextile to be used for mechanical protection of waterproofing and drainage in particular where heavy loads bearing and high drainage capacity are requested

MD

HDPE studded membrane, 4mm thick. Different types are available basing on:

- core weight between 400 and 700g/sqm
- bonding to 1 geotextile (e.g. "12F").
- bonding to 2 geotextiles (e.g. "12F 12F").

It is a product to be used as leak detection or as drainage layer in multi layer waterproofing systems.



Installation of MD 4 50 12F as drainage layer in a landfill

The following tables show the articles included in this EPD with the main technical characteristics.

Studded membranes without geotextile

Code	DESCRIPTION	AV. THICKNESS	APPLICATION
2050	T KONE	7,5 mm	Buildings
2040	T-KONE S	7.5 mm	
1060	TEFOND	7 mm	
1046	TEFOND STAR	7 mm	
1147	TEFOND PLUS STAR	7 mm	
1168	TEFOND HP STAR	7 mm	
2D43	T KONE STAR	7 mm	
2D43	BLACK MEMBRANE STAR	7 mm	
2030	MEMBRANA NERA XS	7.5 mm	
2050	MEMBRANA NERA S	7.5 mm	
2050	MEMBRANA NERA	7,5 mm	
1A42	MD 4 42	5 mm	
1A50	MD 4 50	5 mm	

Studded membranes with geotextile(s)

Code	DESCRIPTION	AV. THICKNESS	APPLICATION
2362	T KONE G DRAIN	8 mm	Buildings
4898	TMD 1011	10 mm	
4F11	TMD 1011 Plus	10 mm	
1177	TEFOND HP DRAIN STAR	7 mm	
1270	TEFOND DRAIN STAR	7 mm	
1670	TEFOND DRAIN PLUS STAR	7 mm	
2362	MEMBRANA NERA GEO	8 mm	
4898	HDD 1085 12F	10 mm	
4811	HDD 1095 12F	10 mm	
4812	HDD 10105 12F	10 mm	
1B62	MD 4 50 12F	6 mm	
1G64	MD 4 50 14F	6 mm	
1B70	MD 4 50 20F	6 mm	
1C74	MD 4 50 12F 12F	6 mm	

LCA INFORMATION

Declared unit:

1 kg of studded membranes, including packaging.

The environmental performance results are presented considering two product groups: membranes without non-woven geotextile and membrane with non-woven geotextile(s). The environmental performances for each product group were calculated as the average between the values of the product that had the greatest impact and those of the product that had the lower impact within the group for the GWP-GHG indicator in modules A1-A3. The results therefore do not refer to a specific real product. The range of variation of the impacts between the products of each group is shown in the following table.

Time representativeness:

Data cover the year 2020.

Database(s) and LCA software used:

Ecoinvent 3.7.1 and SimaPro 9.2.

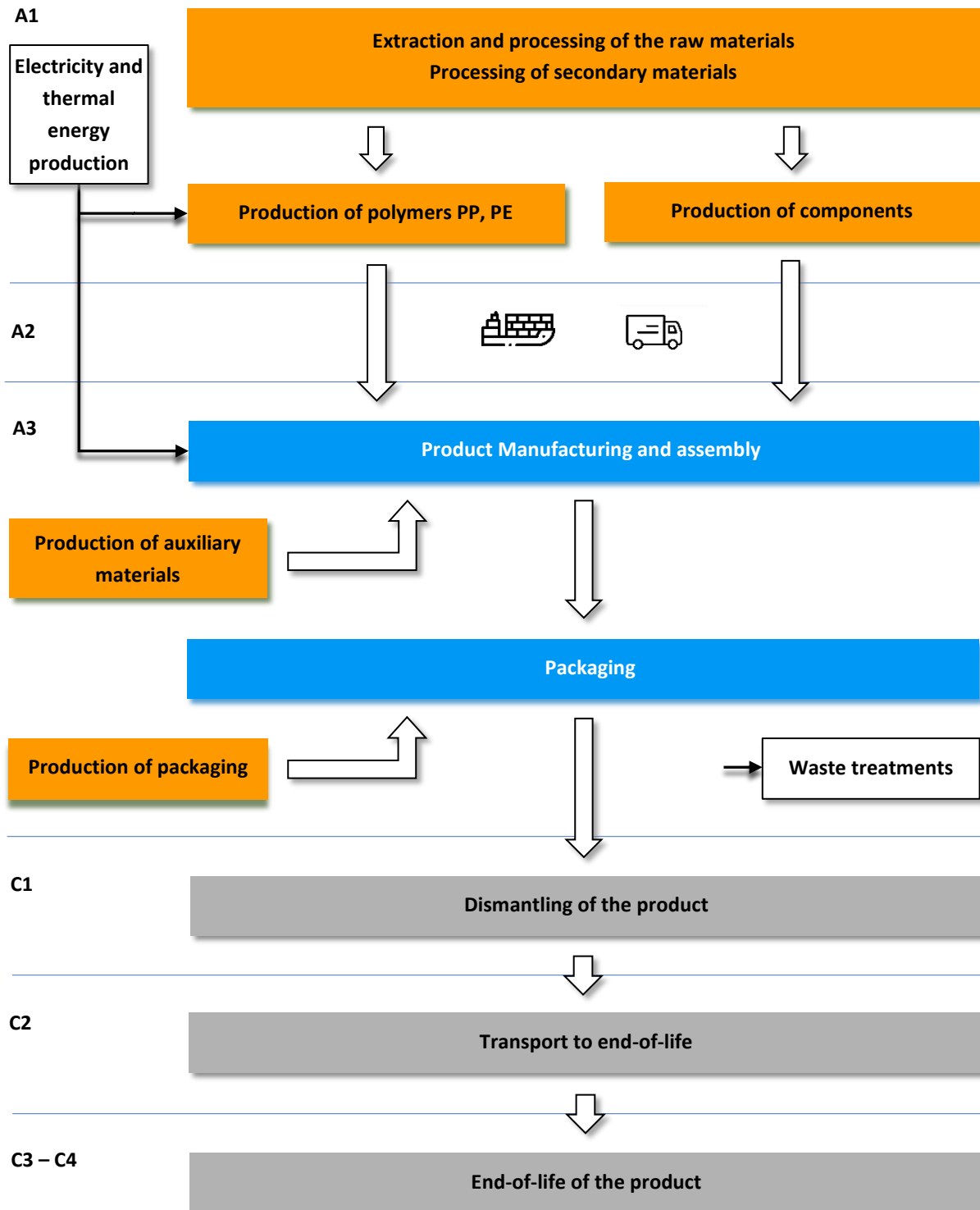
Description of system boundaries:

Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D).

The following table shows the processes included in the system boundaries and the scenarios adopted for the modeling of the modules C1-C4 and D.

Module	Processes and scenarios
A1	<ul style="list-style-type: none"> Extraction and processing of raw materials Processing of secondary materials used as input for manufacturing the product Production of polymers and components Generation of electricity and heat from primary energy resources, also including their extraction, refining and transport
A2	Transportation up to the factory gate and internal transport
A3	<ul style="list-style-type: none"> Production of ancillary materials Extrusion and assembly of the product Manufacturing of packaging Waste treatment
C1	<p>Dismantling of the product including initial on-site sorting of the materials</p> <p>The scenario applied for module C1 is based on the estimate of the fuel consumption required by an excavator to remove the volume of soil above the studded membrane. The scenario includes the conservative assumption that the environmental impacts associated with the excavation activities are fully attributed to the TeMa product.</p>
C2	<p>Transport of the discarded product to a recycling or final disposal site</p> <p>Since specific data relating to the transport distance of the discarded product to a waste treatment center are missing, a distance of 100 km by truck has been assumed.</p>
C3 - C4	<p>Recycling and energy recovery processes of the discarded product (C3)</p> <p>Disposal processes of the discarded product (C4)</p> <p>The end-of-life scenario was developed with reference to a European context through the statistics of the Plastic waste from B&C in EU 2018 report.</p> <p>In the module C3 a virtual emission of biogenic CO₂ has been added so that the uptake related to the wood pallet (packaging) and emissions of biogenic CO₂ are balanced.</p>
D	Benefits and impacts related to material recycling as well as heat and power production from materials sent for energy recovery are part of this module. The recycling and energy recovery scenarios have been defined in accordance with the Plastic waste from B&C in EU 2018 report and with Annex C of the PEFCR Guidance v6.3.

System diagram:



Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation:

LIFE CYCLE STAGE	Module	Modules declared	Geography	Specific data used	Variation – products		Variation – sites	
Product stage	Raw material supply	A1	X	EU	>90%	Membrane without geotextile	Membrane with geotextile	not relevant
	Transport	A2	X	EU				
	Manufacturing	A3	X	IT				
Construction process stage	Transport	A4	N.D.		<10%	+/- 12%		
	Construction intallation	A5	N.D.					
Use stage	Use	B1	N.D.					
	Maintenance	B2	N.D.					
	Repair	B3	N.D.					
	Replacement	B4	N.D.					
	Refurbishment	B5	N.D.					
	Operational energy use	B6	N.D.					
	Operational water use	B7	N.D.					
End of life stage	De-construction demolition	C1	X	EU				
	Transport	C2	X	EU				
	Waste processing	C3	X	EU				
	Disposal	C4	X	EU				
Resource recovery stage	Reuse-Recovery-Recycling-potential	D	X					

X=module included in EPD® / N.D.= not declared

CONTENT DECLARATION

Studded membranes (without geotextile)			
Product components	Weight, kg	Post-consumer material, weight, %	Renewable material, weight, %
Polyethylene, PE	0,84 – 0,97	100	0
Calcium carbonate	0 – 0,10	0	0
Additives	0 – 0,10	0	0
TOTAL	1	84 - 97	0
Packaging materials	Weight, kg	Weight, % (versus the product)	
Wooden pallet	0,042	4,2	
PE film	0,002	0,2	
Thermal ribbon	0,024	2,4	
TOTAL	0,069	6,9	

Studded membranes (with geotextile)			
Product components	Weight, kg	Post-consumer material, weight, %	Renewable material, weight, %
Polyethylene, PE	0,64 – 0,90	100	0
Polypropylene, PP	0,1 – 0,36	0	0
Calcium carbonate	0 – 0,08	0	0
Additives	0 – 0,06	0	0
TOTAL	1	64 – 90	0
Packaging materials	Weight, kg	Weight, % (versus the product)	
Wooden pallet	0,056	5,6	
PE film	0,006	0,6	
Thermal ribbon	0,01	1	
TOTAL	0,072	7,2	

No dangerous substances from the candidate list of SVHC for Authorisation are present.

ENVIRONMENTAL INFORMATION

The results below refer to the declared unit and were assessed using the characterization model and factors reported in Annex C of the standard EN 15804:2012+A2:2019.

Studded membranes (without geotextile)

Potential environmental impact – mandatory indicators according to EN 15804

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	1,32E+00	1,42E-01	2,23E-01	1,68E+00	2,95E+00	1,65E-02	0,00E+00	4,00E-02	-6,07E-01
GWP-biogenic	kg CO ₂ eq.	1,15E-01	3,39E-04	-8,51E-02	3,01E-02	2,31E-03	3,97E-05	8,51E-02	3,53E-05	-6,38E-02
GWP-luluc	kg CO ₂ eq.	7,68E-04	4,76E-05	1,59E-02	1,67E-02	2,33E-04	5,58E-06	0,00E+00	1,38E-06	-1,01E-03
GWP-total	kg CO ₂ eq.	1,43E+00	1,42E-01	1,54E-01	1,73E+00	2,95E+00	1,65E-02	8,51E-02	4,01E-02	-6,72E-01
ODP	kg CFC 11 eq.	1,20E-07	3,21E-08	3,89E-08	1,91E-07	6,32E-07	3,77E-09	0,00E+00	8,79E-10	-1,53E-07
AP	mol H ⁺ eq.	4,68E-03	5,67E-04	4,84E-04	5,73E-03	1,59E-02	8,25E-05	0,00E+00	2,46E-05	-5,63E-04
EP-freshwater	kg PO ₄ ³⁻ eq.	2,29E-03	1,00E-04	1,67E-04	2,56E-03	2,64E-03	1,45E-05	0,00E+00	1,41E-03	-1,83E-03
EP-freshwater	kg P eq.	4,12E-04	9,51E-06	2,90E-05	4,51E-04	8,85E-05	1,11E-06	0,00E+00	4,37E-07	-4,23E-04
EP-marine	kg N eq.	1,08E-03	1,74E-04	1,57E-04	1,41E-03	6,37E-03	2,88E-05	0,00E+00	1,29E-04	-3,16E-04
EP-terrestrial	mol N eq.	9,55E-03	1,89E-03	1,18E-03	1,26E-02	6,98E-02	3,14E-04	0,00E+00	9,16E-05	-1,42E-03
POCP	kg NMVOC eq.	2,94E-03	5,79E-04	4,67E-04	3,98E-03	1,91E-02	8,95E-05	0,00E+00	3,50E-05	1,05E-03
ADP-minerals&metals*	kg Sb eq.	7,60E-06	5,10E-07	7,87E-07	8,90E-06	1,18E-06	5,98E-08	0,00E+00	9,57E-09	4,19E-06
ADP-fossil*	MJ	1,93E+01	2,14E+00	2,18E+00	2,36E+01	4,02E+01	2,51E-01	0,00E+00	6,76E-02	1,08E+01
WDP*	m ³	3,15E-01	6,09E-03	6,10E-02	3,82E-01	5,81E-02	7,14E-04	0,00E+00	2,91E-03	7,43E-01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption									

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Potential environmental impact – additional mandatory and voluntary indicators

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	1,31E+00	1,40E-01	2,32E-01	1,69E+00	2,93E+00	1,63E-02	0,00E+00	3,25E-02	-6,56E-01

Use of resources

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
PERE	MJ	1,58E+00	2,10E-02	5,16E-02	1,65E+00	1,57E-01	2,46E-03	0,00E+00	9,16E-04	-1,27E+00
PERM	MJ	4,15E-01	7,84E-03	1,09E+00	1,52E+00	5,12E-02	9,20E-04	0,00E+00	2,90E-04	-1,34E-01
PERT	MJ	1,99E+00	2,88E-02	1,15E+00	3,17E+00	2,08E-01	3,38E-03	0,00E+00	1,21E-03	-1,40E+00
PENRE	MJ	2,04E+01	2,27E+00	1,75E+00	2,44E+01	4,27E+01	2,66E-01	0,00E+00	7,18E-02	-1,20E+01
PENRM	MJ.	3,13E-01	0,00E+00	6,01E-01	9,14E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,33E+01
PENRT	MJ	2,07E+01	2,27E+00	2,35E+00	2,53E+01	4,27E+01	2,66E-01	0,00E+00	7,18E-02	1,13E+01
SM	kg	9,15E-01	0,00E+00	0,00E+00	9,15E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	1,05E-02	2,15E-04	1,50E-03	1,22E-02	1,94E-03	2,52E-05	0,00E+00	6,97E-05	2,66E-03
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

¹ The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Waste production and output flows

Waste production

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,84E-05	5,58E-06	1,53E-06	2,55E-05	1,09E-04	6,54E-07	0,00E+00	1,01E-07	-2,31E-05
Non-hazardous waste disposed	kg	2,39E-01	1,02E-01	1,66E-02	3,58E-01	4,85E-02	1,20E-02	0,00E+00	2,71E-01	-1,42E-01
Radioactive waste disposed	kg	6,53E-05	1,47E-05	4,44E-06	8,44E-05	2,80E-04	1,72E-06	0,00E+00	4,02E-07	-7,75E-05

Output flows

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	2,09E-02	2,09E-02	0,00E+00	0,00E+00	2,40E-01	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,90E-01	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Biogenic carbon content

Results per declared unit		
Indicator	Unit	
Biogenic carbon content in accompanying packaging	Kg C	2,19E-02

There is no biogenic carbon content in the product.

Studded membranes (with geotextile)

Potential environmental impact – mandatory indicators according to EN 15804

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	1,52E+00	1,03E-01	1,98E-01	1,82E+00	1,41E+00	1,65E-02	0,00E+00	3,86E-02	-7,63E-01
GWP-biogenic	kg CO ₂ eq.	9,58E-02	2,46E-04	-1,04E-01	-8,40E-03	1,11E-03	3,97E-05	8,51E-02	3,52E-05	-5,51E-02
GWP-luluc	kg CO ₂ eq.	1,22E-03	3,46E-05	6,69E-03	7,94E-03	1,12E-04	5,58E-06	0,00E+00	1,37E-06	-9,79E-04
GWP-total	kg CO ₂ eq.	1,61E+00	1,03E-01	1,00E-01	1,82E+00	1,42E+00	1,65E-02	8,51E-02	3,86E-02	-8,19E-01
ODP	kg CFC 11 eq.	1,06E-07	2,34E-08	2,42E-08	1,53E-07	3,03E-07	3,77E-09	0,00E+00	8,78E-10	-1,51E-07
AP	mol H ⁺ eq.	5,60E-03	4,12E-04	3,57E-04	6,37E-03	7,64E-03	8,25E-05	0,00E+00	2,45E-05	-1,06E-03
EP-freshwater	kg PO ₄ ³⁻ eq.	2,35E-03	7,30E-05	1,22E-04	2,54E-03	1,27E-03	1,45E-05	0,00E+00	1,36E-03	-1,75E-03
EP-freshwater	kg P eq.	4,44E-04	6,91E-06	2,19E-05	4,73E-04	4,24E-05	1,11E-06	0,00E+00	4,35E-07	-4,21E-04
EP-marine	kg N eq.	1,23E-03	1,26E-04	1,08E-04	1,46E-03	3,05E-03	2,88E-05	0,00E+00	1,25E-04	-3,65E-04
EP-terrestrial	mol N eq.	1,13E-02	1,38E-03	9,28E-04	1,36E-02	3,34E-02	3,14E-04	0,00E+00	9,14E-05	-2,21E-03
POCP	kg NMVOC eq.	3,94E-03	4,20E-04	3,76E-04	4,73E-03	9,17E-03	8,95E-05	0,00E+00	3,46E-05	4,97E-04
ADP-minerals&metals*	kg Sb eq.	9,00E-06	3,70E-07	5,50E-07	9,92E-06	5,68E-07	5,98E-08	0,00E+00	9,55E-09	3,06E-06
ADP-fossil*	MJ	3,30E+01	1,56E+00	1,57E+00	3,61E+01	1,93E+01	2,51E-01	0,00E+00	6,75E-02	3,20E+00
WDP*	m ³	5,90E-01	4,42E-03	4,97E-02	6,44E-01	2,79E-02	7,14E-04	0,00E+00	2,91E-03	5,70E-01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption									

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Potential environmental impact – additional mandatory and voluntary indicators

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-GHG ²	kg CO ₂ eq.	1,49E+00	1,02E-01	1,98E-01	1,79E+00	1,40E+00	1,63E-02	0,00E+00	3,13E-02	-7,97E-01

Use of resources

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
PERE	MJ	1,56E+00	1,53E-02	3,90E-02	1,62E+00	7,54E-02	2,46E-03	0,00E+00	9,12E-04	-1,24E+00
PERM	MJ	3,98E-01	5,70E-03	1,29E+00	1,70E+00	2,46E-02	9,20E-04	0,00E+00	2,89E-04	-1,51E-01
PERT	MJ	1,96E+00	2,10E-02	1,33E+00	3,31E+00	1,00E-01	3,38E-03	0,00E+00	1,20E-03	-1,40E+00
PENRE	MJ	2,42E+01	1,65E+00	1,24E+00	2,71E+01	2,05E+01	2,66E-01	0,00E+00	7,17E-02	-1,50E+01
PENRM	MJ.	1,11E+01	0,00E+00	4,48E-01	1,16E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,81E+01
PENRT	MJ	3,53E+01	1,65E+00	1,69E+00	3,87E+01	2,05E+01	2,66E-01	0,00E+00	7,17E-02	3,18E+00
SM	kg	7,68E-01	0,00E+00	0,00E+00	7,68E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	1,36E-02	1,56E-04	1,23E-03	1,50E-02	9,32E-04	2,52E-05	0,00E+00	6,96E-05	6,32E-04
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

² The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Waste production and output flows

Waste production

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,67E-05	4,05E-06	1,23E-06	2,20E-05	5,20E-05	6,54E-07	0,00E+00	1,01E-07	-2,25E-05
Non-hazardous waste disposed	kg	2,18E-01	7,45E-02	1,44E-02	3,07E-01	2,33E-02	1,20E-02	0,00E+00	2,70E-01	-1,15E-01
Radioactive waste disposed	kg	6,68E-05	1,07E-05	3,21E-06	8,07E-05	1,34E-04	1,72E-06	0,00E+00	4,02E-07	-7,53E-05

Output flows

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	2,09E-02	2,09E-02	0,00E+00	0,00E+00	2,40E-01	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,90E-01	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Biogenic carbon content

Results per declared unit		
Indicator	Unit	
Biogenic carbon content in accompanying packaging	Kg C	2,92E-02

There is no biogenic carbon content in the product.

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