

Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Nonwoven Needle-Punched Geotextiles

from

Thrace Nonwovens & Geosynthetics S.A.



Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	Type A
EPD registration number:	EPD-IES-0002479:002 (S-P-02479)
Version date:	2026-07-01
Validity date:	2031-06-30
<i>EPD of multiple products, based on the average results of the product group – see Product Information section for details on the products covered.</i>	
<i>An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com</i>	



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:	support@environdec.com

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): <i>PCR 2019:14 Construction products (EN 15804+A2) (2.0.1), 29722 Nonwovens</i>
PCR review was conducted by: <i>The Technical Committee of the International EPD® System, Contact via info@environdec.com</i>
c-PCR, if applicable: <i>None</i>

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:
☒ Individual EPD verification without a pre-verified LCA/EPD tool Third-party verifier: Eurocert S.A. Eurocert S.A. is an approved certification body accountable for the third-party verification. The certification body is accredited by: Hellenic Accreditation System SA (E.S.Y.D), Accreditation number 21-8

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 published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterization factors); and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: Thrace Nonwoven & Geosynthetics SA

Address: Magiko, 671 00 Xanthi, Greece

Contact: Mrs. Athina Papadaniil, apapadaniil@thraceplastics.gr

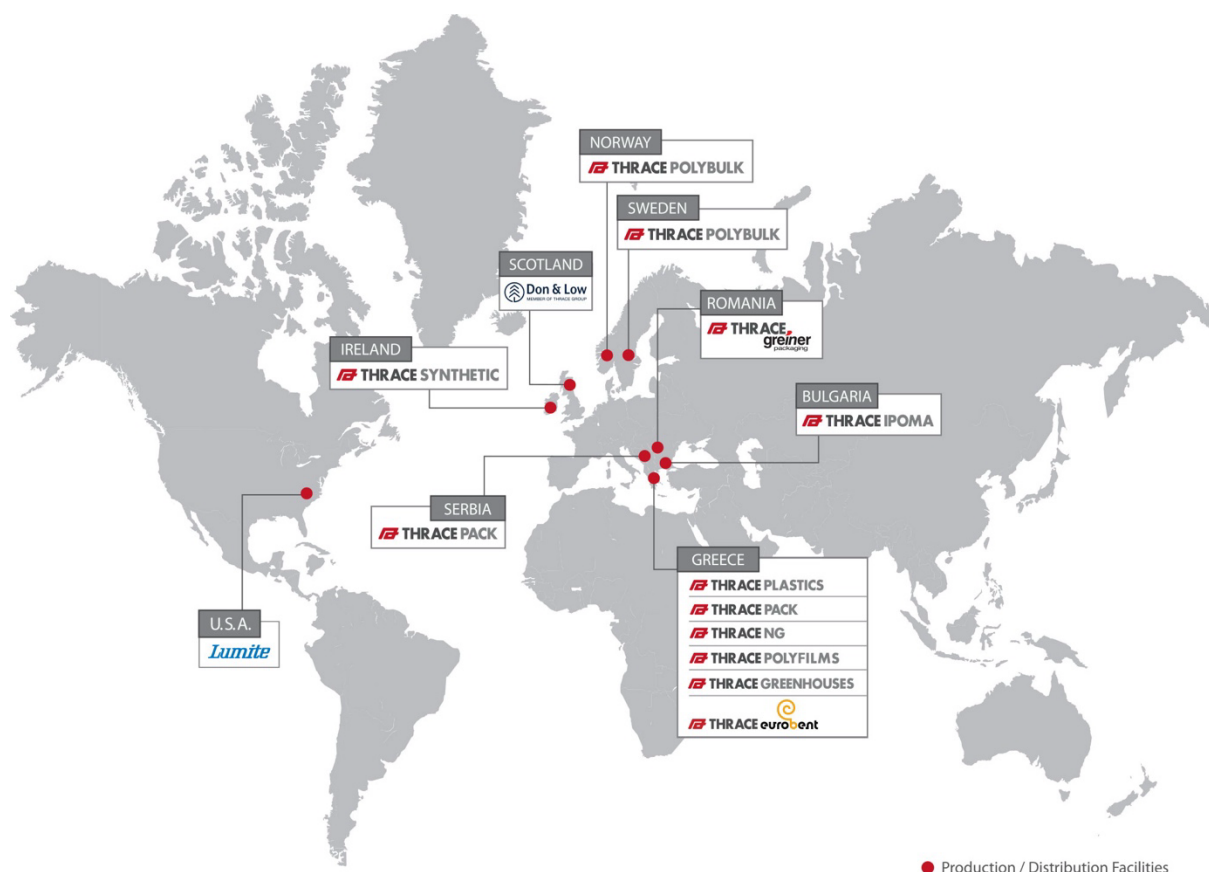
Mr. Kyriakos Mystikos, kmystikos@thraceplastics.gr

Mr. Konstantinos Emmanouil, kemmanouil@thraceplastics.gr

Description of the organization:

THRACE Group has been active in polypropylene conversion since 1977 and manufactures technical fabrics and packaging products for a range of applications. The Group operates in 10 countries and uses 28 production technologies across its activities. THRACE Group supplies products to customers in more than 80 countries. Its operations include vertically integrated production processes and quality control activities relevant to the products manufactured.

Thrace Nonwovens & Geosynthetics S.A. (Thrace NG) is part of THRACE Group and operates at Magiko, Xanthi, Greece. The site is historically significant for the Group, as it is linked to the original development of THRACE Group's polypropylene conversion activities. Thrace NG is also one of the Group's largest operating companies, based on its production activities and role within the technical fabrics and geosynthetics sector. The company manufactures nonwoven geotextiles and related geosynthetic products for civil engineering, infrastructure, hydraulic and environmental applications. Thrace NG operates certified management systems covering quality, environmental management, occupational health and safety, and energy management.



Product-related or management system-related certifications:

CE mark for geotextiles and related products

NorGeoSpec certification for Thrace N1~N5 series of geotextiles

IVG certification for thrACE GR series of geotextiles

ASQUAL certification for PANDAGEO series of geotextiles

AASHTO GTX certification for G-EX series of geotextiles
ISO 9001 – Quality Management System
ISO 14001 – Environmental Management System
ISO 45001 – Health & Safety Management System
ISO 50001 – Energy Management System

PRODUCT INFORMATION

Product identification:

Brand name
AtlanTec
MGR
PANDAGEO
S NW
Thrace
TP
GV
AR NW
CL NW
NW

Brand name
NWD
P NW
thrACE
AF
BGSF
BGRK
GtK
Bond Breaker
WK
CNW

Brand name
GB
G EX
SAG EX
GT
EG
PPN
NWA
AS
FB

This EPD covers multiple polypropylene needle-punched nonwoven geotextile products manufactured by Thrace Nonwovens & Geosynthetics S.A. at Magiko, Xanthi, Greece. The EPD is based on the average results of the product group. The covered products are listed in the Product Variants and Applications section and product-specific estimates may be derived only using the conversion factors declared in the LCA information section.

Visual representation





UN CPC code: 29722 Nonwovens

HS Code: 5603 Nonwoven fabrics

Other codes for product classification: Not applicable

Product Variants and Applications

S_NW series. Intended for separation & filtration & drainage. THRACE S_NW geotextiles are mechanically bonded, thermally treated nonwoven geotextiles manufactured from UV-stabilized polypropylene staple fibres. The products are designed to provide mechanical and hydraulic performance for geosynthetic applications, according to the applicable product specifications and declared performance documentation. The products are intended for applications requiring a declared service life of up to 100 years, subject to correct product selection, installation and use conditions, and subject to the durability requirements of the applicable harmonized geotextile standards. They are supplied in standard 100 m rolls with widths up to 6.0 m, or in mini rolls of varying lengths. S_NW geotextiles are designed to provide resistance to installation-related mechanical stresses, including burst and abrasion actions, according to the relevant tested product characteristics. Their hydraulic performance is defined by declared permeability and filtration-related properties. Chemical resistance is assessed in relation to the intended exposure conditions and the applicable geotextile durability requirements. The product mass per unit area ranges from 80 to 360 g/m².



S_NW geotextiles are designed to provide resistance to installation-related mechanical stresses, including burst and abrasion actions, according to the relevant tested product characteristics. Their hydraulic performance is defined by declared permeability and filtration-related properties. Chemical resistance is assessed in relation to the intended exposure conditions and the applicable geotextile durability requirements. The product mass per unit area ranges from 80 to 360 g/m².

CL_NW series. Intended for separation, filtration & drainage. THRACE CL_NW geotextiles are mechanically bonded nonwoven geotextiles manufactured from UV-stabilized polypropylene staple fibres. The products are designed to provide mechanical and hydraulic performance for geosynthetic applications, according to the applicable product specifications and declared performance documentation. The products are intended for applications requiring a declared service life of up to 100 years, subject to correct product selection, installation and use conditions, and subject to the durability requirements of the applicable harmonized geotextile standards. They are supplied in standard 100 m rolls with widths up to 6.0 m, or in mini rolls of varying lengths. CL_NW geotextiles are designed to provide deformability for contact with uneven ground surfaces, according to the relevant product characteristics. Their resistance to installation-related mechanical stresses is defined by tested properties such as burst resistance and dynamic perforation resistance. Their hydraulic performance is defined by declared permeability and filtration-related properties. Chemical resistance is assessed in relation to the intended exposure conditions and the applicable geotextile durability requirements. The product mass per unit area ranges from 100 to 300 g/m².

C_NW series. Intended for separation, filtration & drainage, and protection over 400gr/m². THRACE C_NW geotextiles are coloured, mechanically bonded nonwoven geotextiles manufactured from UV-stabilized polypropylene staple fibres. The products are designed to provide mechanical and hydraulic performance for geosynthetic applications, according to the applicable product specifications and declared performance documentation. The products are intended for applications requiring a declared service life of up to 100 years, subject to correct product selection, installation and use conditions, and subject to the durability requirements of the applicable harmonized geotextile standards. They are supplied in standard 100 m rolls with widths up to 6.0 m, in jumbo rolls, or in mini rolls of varying lengths. C_NW geotextiles are designed to provide deformability for contact with uneven ground surfaces, according to the relevant product characteristics. Their hydraulic performance varies by product grade and is defined by declared permeability and filtration-related properties. Heavier grades may be used as cushioning or protection layers in lining systems, where supported by the relevant product specifications. Chemical resistance is assessed in relation to the intended exposure conditions and the

applicable geotextile durability requirements. The product mass per unit area ranges from 100 to 1200 g/m².

P_NW series. Intended applications: protection, separation, filtration and drainage. THRACE P_NW geotextiles are mechanically bonded nonwoven geotextiles manufactured from UV-stabilized polypropylene staple fibres. The products are designed to provide mechanical and hydraulic performance for geosynthetic applications, according to the applicable product specifications and declared performance documentation. The products are intended for applications requiring a declared service life of up to 100 years, subject to correct product selection, installation and use conditions, and subject to the durability requirements of the applicable harmonized geotextile standards. They are supplied in rolls with widths up to 6.0 m and lengths up to 100 m. P_NW geotextiles are designed to provide resistance to installation-related mechanical stresses, including burst and abrasion actions, according to the relevant tested product characteristics. Their hydraulic performance is defined by declared permeability and filtration-related properties. Their elongation and deformation behaviour are defined by the declared tensile characteristics of each grade. Chemical resistance is assessed in relation to the intended exposure conditions and the applicable geotextile durability requirements. The product mass per unit area ranges from 400 to 2000 g/m².

Thrace NG's **NorGeoSpec-certified** nonwoven geotextiles are polypropylene geotextiles manufactured for separation and filtration applications in civil engineering works. The certified products are covered by the NorGeoSpec certification system for the relevant product grades and declared functions. Thrace N1–N5 NorGeoSpec-certified products provide mechanical and hydraulic properties according to their declared product specifications and the applicable certification requirements. Their use in infrastructure applications shall be based on the relevant project requirements, product grade selection, declared performance values and applicable installation conditions. The products are available in different mass-per-unit-area grades and are supplied in standard, jumbo or mini rolls, depending on the product configuration.

ASQUAL-certified products. Intended applications: separation and filtration; selected grades may also be used for protection applications where covered by the declared product characteristics and certification scope. Thrace's PANDAGEO nonwoven geotextiles are polypropylene geotextiles manufactured by Thrace Nonwovens & Geosynthetics S.A. The PANDAGEO range includes products certified under the ASQUAL "Géotextiles et produits apparentés" scheme for the relevant product grades and declared functions. PANDAGEO products provide hydraulic and mechanical properties according to their declared product specifications and the applicable certification requirements. Their suitability for long-term infrastructure use depends on correct product selection, installation conditions, exposure conditions and compliance with the applicable geotextile durability requirements.



thrACE IVG-certified products. The thrACE GR2, thrACE GR3, thrACE GR3V, thrACE GR4, thrACE GR5 and thrACE GR5-PRO products are polypropylene, thermally treated, needle-punched nonwoven geotextiles manufactured by Thrace Nonwovens & Geosynthetics S.A. at Magiko, Xanthi, Greece. The products are covered by IVG product certification for the relevant product grades and declared functions. thrACE GR2, GR3, GR3V, GR4 and GR5 are certified for separation and filtration applications, while thrACE GR5-PRO is certified for separation, filtration, drainage and protection applications. The declared performance characteristics, intended uses and applicable harmonized technical specifications are provided in the relevant Declaration of Performance and technical data sheets.

Of all the product variations, Thrace NT2 has the highest environmental impacts due to lower mass per unit area and higher packaging weight per unit of product. This is an EPD of multiple products based on the average of all product results.

The following table summarizes the main geosynthetic functions relevant to the product range and its intended applications. The applicability of each function depends on the specific product grade, declared performance characteristics, certification scope, project requirements and installation conditions.



SEPARATION to prevent the intermixing of adjacent dissimilar soils and/or fill materials, maintaining the integrity and performance of each layer within a construction system

FILTRATION to restrain the uncontrolled passage of soil or other particles subjected to hydrodynamic forces, while allowing the flow of fluids through or across a geosynthetic material.

REINFORCEMENT to use the stress – strain behaviour of a geosynthetic material to improve the mechanical performance of a system or structure made of soil or other construction materials.

STABILIZATION to improve the mechanical behaviour of an unbound granular material by incorporating one or more geosynthetic layers thereby reducing deformation under load by limiting particle movement.

DRAINAGE to collect and transport precipitation, groundwater or other fluids (or all three), within the plane of a geosynthetic material.

PROTECTION to prevent or limit local damage to a given element or material through the use of a geosynthetic material.

STRESS RELIEF to allow for slight differential movement between two layers separated by an adequately bitumen – saturated interlayer (e.g. paving geotextile or composite paving grid), thereby relieving stresses to delay or even prevent reflective cracking

INTERLAYER BARRIER to prevent or reduce water infiltration by forming a moisture – resistant interlayer between pavement layers

Name and location of production site(s):

Thrace Nonwovens & Geosynthetics S.A., Magiko, 671 00 Xanthi, Greece, www.thracegroup.com

Name of manufacturer:

Thrace Nonwovens & Geosynthetics S.A.

CONTENT DECLARATION

Mass of one unit of product per declared unit (without packaging): 155.2 kg
Declared unit: 1000 m²

The average product declared in this EPD represents the production-weighted average of the polypropylene needle-punched nonwoven geotextile product family covered by the declaration. The included products have the same basic material composition and manufacturing route and differ mainly in mass per unit area, thickness, roll configuration and mechanical performance. The content declaration and environmental results are reported for a representative declared unit of 1000 m², corresponding to 155.2 kg of product, based on the average material composition and production data for the reference year. The representative thickness of the average product is 1.13 mm, determined as the roll-weighted average of 2025 QC test results measured at 2 kPa, and the corresponding representative density is 138 kg/m³. The average product is a calculation basis for the product family and does not represent one specific commercial article; values for individual product grades may differ.

Technical characteristics, product-specific performance values and declared uses are provided in the relevant product datasheets and Declarations of Performance (DoP), where applicable. As this EPD covers an average product for a family of polypropylene needle-punched nonwoven geotextiles, the content declaration represents the average material composition per declared unit and does not replace product-specific technical documentation. Users shall refer to the applicable datasheet and DoP for the selected product grade when assessing suitability for a specific application.

Declaration of relevant non-scaling physical product properties: The relevant non-scaling physical properties declared for the representative average product are thickness and area density. The declared thickness is 0.00113 m, corresponding to 1.13 mm, determined from 2025 QC thickness measurements under 2 kPa. The declared area density of the representative average product is 0.1552 kg/m², calculated from the declared mass of 155.2 kg per declared unit of 1,000 m². These values describe the production-weighted average product used as the calculation basis for this EPD and do not represent one specific commercial article; product-specific thickness, area density and performance values may differ and are provided in the relevant technical datasheets and Declarations of Performance.

Content:

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Polypropylene	151.8	0	0	0
Masterbatch	1.9	0	0	0
Spin Finish	1.5	0	0	0
TOTAL	155.2	0	0	0

Mass of packaging per declared unit of product: 6.93 kg

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Plastic Packaging	4.31	2.78%	0
Cardboard Packaging	2.62	1.69%	1.15
TOTAL	6.93	4.46%	1.15

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO₂.

Information on the environmental and hazardous/toxic properties of a substances contained in the product: The product does not contain substances listed in the REACH Candidate List of Substances of Very High Concern (SVHC) in concentrations exceeding 0.1% by weight.

Other information on substances with hazardous and toxic properties: No other hazardous substances relevant for human health or the environment are intentionally added to the product.

The declared biogenic carbon content of packaging is 1.15 kg C per declared unit (1000m²), associated with cardboard packaging. The product itself contains 0 kg biogenic carbon.

The declared share of post-consumer recycled material per declared unit (1000m²) is 0 kg. Internal rework material used within the production system amounts to 2.44 kg per declared unit and is not declared as recycled content.

Hazardous substances from the candidate list of SVHC	EC No.	CAS No.	Mass-% per product or declared unit
None	-	-	0%

LCA INFORMATION

Mass of one unit of product per declared unit (without packaging):

155.2 kg

Declared unit:

1000 m²

This EPD is declared as Type A: cradle to gate with modules C1–C4 and Module D. This scope was selected because the products are construction products for which the production stage, end-of-life stage and benefits and loads beyond the system boundary can be modelled using a declared unit, while transport to the customer, installation and use-stage conditions are application- and project-specific and are therefore not declared.

For the impact assessment, an average product was defined as the reference product. As the products covered by this EPD are homogeneous on a mass basis per declared unit, the average product is representative of the composition of all products included within the declared family. The individual products differ only in selected physical and mechanical characteristics, including mass per unit area, thickness, tensile strength, and elongation.

All environmental performance indicators were calculated with reference to this average product. The associated packaging was also defined as an average, based on the actual production data for the reference year. As a mathematical construct, this average product does not correspond to a physically existing item. Additionally, environmental performance indicators were determined for two further scenarios: a best-case scenario, corresponding to the lowest impact in the GWP-GHG category, and a worst-case scenario, corresponding to the highest impact in the same category. These two scenarios differ from the average product only with respect to packaging composition.

The maximum variation between the best-case and worst-case scenarios and the average product is reported in this declaration. Accordingly, the environmental impact range of the product family is expressed relative to the average product.

Conversion factors:

Style	Factor
Thrace N1	0.5484
Thrace N2	0.8127
Thrace N3	1.1232
Thrace N4	1.5197
Thrace N5	2.0483
100NWD	0.6607
130NWD	0.8590
150NWD	0.9911
170NWD	1.1232
190NWD	1.2554
270NWD	1.7840
thrACE GR2	0.6938
thrACE GR3	0.9911
thrACE GR3V	1.2884
thrACE GR4	1.7840
thrACE GR5	2.1474
thrACE GR5-PRO	3.3037
P100NW	0.6607
P150NW	0.9911
P200NW	1.3215
P250NW	1.6518
P300NW	1.9822
P350NW	2.3126
P400NW	2.6429
P430NW-PR	2.8412
P450NW	2.9733
P500NW	3.3037
P550NW	3.6340
P600NW	3.9644
P700NW	4.6251
P800NW	5.2859
P900NW	5.9466
P1000NW	6.6073
P1200NW	7.9288
P1500NW	9.9110

Style	Factor
P1600NW	10.5717
P1800NW	11.8932
P2000NW	13.2147
PANDAGEO NT2	0.4757
PANDAGEO NT3	0.5814
PANDAGEO NT4	0.8457
PANDAGEO NT5	1.1431
PANDAGEO NT6	1.4206
PANDAGEO NT7	1.7179
PANDAGEO NT22	0.4625
PANDAGEO NT33	0.5616
PANDAGEO NT44	0.8061
PANDAGEO NT55	1.1431
PANDAGEO NT66	1.3809
PANDAGEO NT77	1.7179
PANDAGEO NT2.2	0.6277
PANDAGEO NT3.3	0.6277
PANDAGEO NT4.4	0.8722
PANDAGEO NT5.5	1.1761
PANDAGEO NT6.6	1.4536
PANDAGEO NT300	1.9822
PANDAGEO NT400	2.6429
S6NW	0.5286
S8NW	0.6607
S8NW-C	0.6938
S9NW	0.7268
S10NW	0.7929
S12NW	0.9250
S13NW	0.9911
S14NW	1.0572
S15NW	1.1232
S16NW	1.1893
S18NW	1.3215
S20NW	1.5527
S22NW	1.7840

Style	Factor
S23NW	1.8831
S25NW	1.9822
S28NW	2.1474
S30NW	2.5108
AtlanTec C1	0.6277
AtlanTec C2	0.8391
AtlanTec C3	0.9911
TP S1	1.1232
TP S2	1.8831
GV W125	0.8259
GV X100	0.6607
GV X140	0.9250
GV X260	1.7179
AR100NW	0.6607
AR120NW	0.7929
AR140NW	0.9250
CL100NW	0.6607
CL120NW	0.7929
CL125NW	0.8259
CL130NW	0.8590
CL140NW	0.9250
CL150NW	0.9911
CL160NW	1.0572
CL180NW	1.5286
CL200NW	1.3215
CL220NW	1.4536
CL240NW	1.5858
CL250NW	1.6518
CL255NW	1.6849
CL300NW	1.9822
80NW	0.5286
90NW	0.5947
100NW	0.5484
110NW	0.7268
120NW	0.7929

Style	Factor
140NW	0.8391
170NW	1.1232
190NW	1.1563
200NW	1.3215
220NW	1.4536
270NW	1.5858
300NW	1.9822
325NWA	2.1474
350NW	2.3126
400NW	2.1804
500NW	3.3037
520NW	3.4358
600NW	3.8323
1200NW	7.9288
1500NW	9.9110
1600NW	10.5717
1800NW	11.8932
2000NW	13.2147
272NW	1.7972
543NW	3.5878
1088NW	7.1888
MGR3	0.9911
MGR4	1.6518
MGR5	1.9822
AF60NW	0.3964
AF110NW	0.7268
BGSF1	2.5108
BGSF2	1.7840
BGSF3	1.5527
BGRK3	0.9911
BGRK4	1.3215
BGRK5	1.9822
GitK3	1.1232
GitK4	1.5197
GitK5	2.0483
BB500NW	3.3037
WK100	0.6607
WK120	0.7929
80CNW	0.5286
90CNW	0.5947
100CNW	0.6607
120CNW	0.7929
150CNW	0.9911
160CNW	1.0572
170CNW	1.1232
200CNW	1.3215
285CNW	1.7840
300CNW	1.8831
350CNW	2.3126
400CNW	2.6429
450CNW	2.9733
500CNW	3.1054
600CNW	3.7662
700CNW	4.6251

Style	Factor
800CNW	5.2859
900CNW	5.9466
1000CNW	6.1448
1100CNW	7.2681
1200CNW	7.9288
2000CNW	13.2147
GB210	1.3875
GB245	1.6188
GB800	5.2859
G120EX	0.6607
G125EX	0.7466
G130EX	0.8523
G140EX	0.9581
G145EX	1.1232
G150EX	1.2091
G160EX	1.5659
G180EX	1.5659
G225EX	2.0152
G245EX	2.2399
G250EX	2.3522
G275EX	2.6892
G350EX	3.4160
SAG450EX	5.3519
SAG1100EX	7.2681
SAG1210EX	7.9949
SAG120EX	0.6607
SAG125EX	0.7268
SAG130EX	0.8259
SAG140EX	0.9250
SAG145EX	1.1232
SAG150EX	1.2091
SAG160EX	1.4536
SAG180EX	1.5659
SAG225EX	1.7906
SAG245EX	1.9822
SAG250EX	2.2399
SAG275EX	2.5108
SAG350EX	2.9733
GT12A-1	2.2465
GT12A-2	2.6826
GT12A-3	3.5812
GT12A-4	5.3652
GT12A-5	7.1359
GT12A-6	13.2147
GT12B-1	2.3126
GT12B-2	2.6429
GT12B-3	3.9644
GT12B-4	5.2859
GT12B-5	6.6073
GT12B-6	13.2147
EG4	0.9382
EG6	1.4140
EG8	1.8831
EG9	2.3522

Style	Factor
EG12	2.8213
EG14	3.2905
EG16	3.7662
EG20	3.7662
EG24	4.7044
EG28	6.5875
EG32	7.5258
PPN105	0.7400
PPN125	0.8854
PPN155	1.0770
PPN180	1.2752
PPN200	1.3875
PPN250	1.7708
PPN275	1.9492
PPN325	2.3126
PPN400	2.8412
PPN500	3.5481
PPN600	4.1626
PPN700	4.9555
PPN800	5.6823
NWA80	0.5286
NWA100	0.6607
NWA105	0.6938
NWA125	0.8259
NWA155	1.0241
NWA165	1.0902
NWA180	1.1893
NWA200	1.3215
NWA215	1.4206
NWA240	1.5858
NWA250	1.6518
NWA285	1.8831
NWA325	2.1474
NWA400	2.6429
NWA500	3.3037
NWA600	3.9644
NWA700	4.6251
NWA800	5.2859
AS140	0.6607
AS240	0.7929
AS280	1.1232
AS410	1.5858
AS440	1.9822
AS640	2.6429
AS680	3.3037
FB71NW	0.4691
FB75NW	0.4956
FB90NW	0.5947
FB91NW	0.6013
FB100NW	0.6607
FB110NW	0.7268
FB210NW	1.3875
FB150NW	0.9911

Reference service life: The geotextiles covered by this EPD are designed for long-term use in the intended applications covered by EN 13249:2016, EN 13250:2016, EN 13251:2016, EN 13252:2016, EN 13253:2016, EN 13254:2016, EN 13255:2016, EN 13256:2016, EN 13257:2016, EN 13265:2016 and EN 15381:2008. In accordance with the durability provisions of the relevant Annex B requirements, and provided that the products are properly selected, installed, used and maintained, the predicted service life is 50 or 100 years, depending on the product family, for use in natural soils with $4 \leq \text{pH} \leq 9$ and soil temperatures $\leq 25^\circ\text{C}$, subject to compliance with the applicable durability testing and retained strength requirements. The indicated service life is a minimum durability indication for product selection and shall not be interpreted as a manufacturer guarantee.

Time representativeness: Data cover a calendar year, reference year 2025

Geographical scope: The study has a worldwide geographical scope. The manufacturing processes are located in Magiko, 671 00, Xanthi, Greece, while the raw materials originate from Greece, other European countries, and the Middle East.

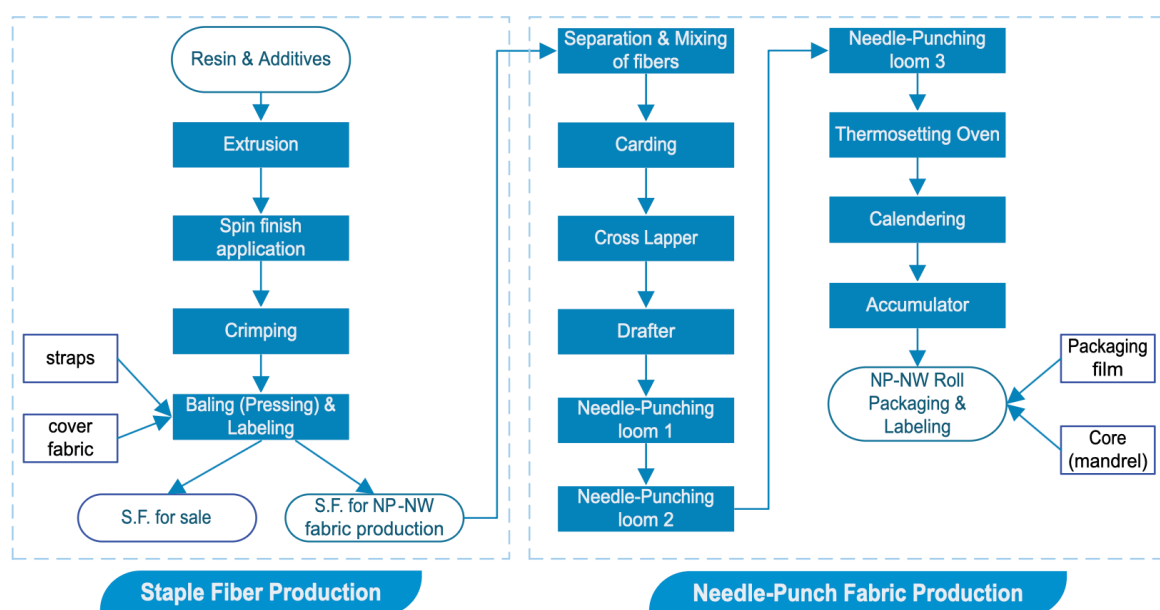
Database(s) and LCA software used: OneClick LCA, Ecoinvent 3.10 / 3.11 / 3.12

EPD/LCA Tool used: One Click LCA EPD Generator

Description of system boundaries:

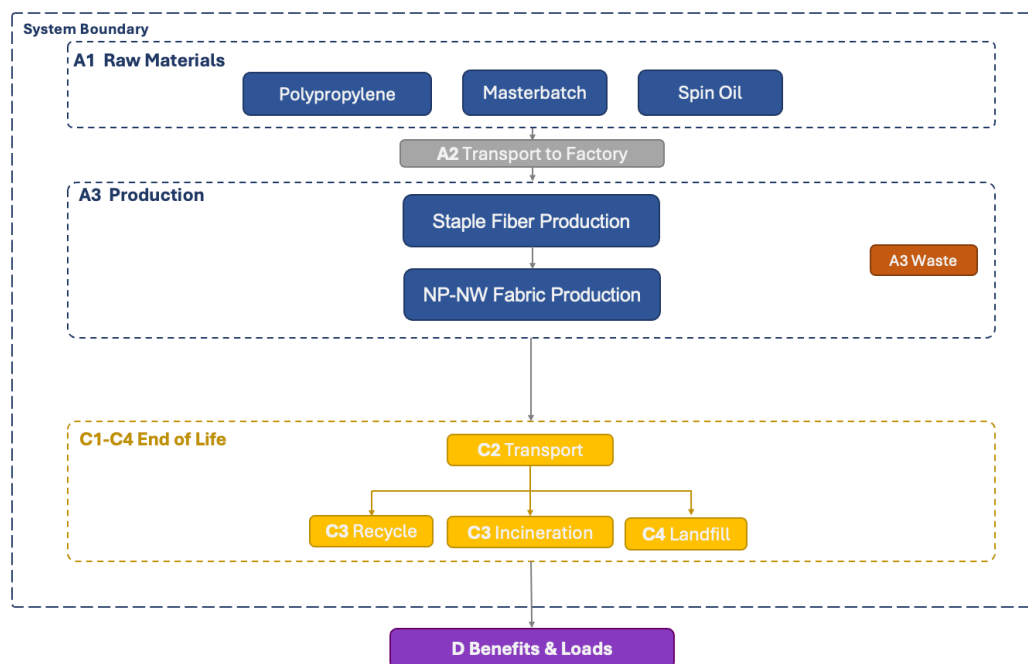
EPD Type A: Cradle to gate with module C1-C4, D. The Use stage (B1–B7) is not mandatory and is not included within the scope of this study.

Production Process flow diagram:



The production process consists of two integrated stages. In staple fiber production, polypropylene resin and additives are extruded, treated with spin finish, crimped, baled and labelled. The fibers are then either sold as staple fibers or transferred internally to the needle-punch fabric lines, where they are opened, mixed, carded, cross-lapped, drafted, needle-punched, thermoset, calendered, accumulated, packaged and labelled as finished NP-NW rolls.

System Boundaries: Module D is included in this study and EPD to report potential benefits and loads beyond the product system boundary, even though it is not part of the product life-cycle modules A1–C4. The reported Module D results represent potential credits and loads associated with recycling and energy recovery from incineration at end of life and are declared separately from the life-cycle impacts. This maintains the modular structure of the EPD while providing additional information on potential recovery benefits beyond the system boundary.



Allocation: In this study allocation could not be avoided for ancillary material, energy consumption and waste production as the information was measured on factory or production process level. The inputs were allocated to studied products based on annual production volumes (mass allocation). The allocations in the Ecoinvent 3.10.1, 3.11, 3.12 datasets used in this study follow the Ecoinvent system model 'Allocation, cut-off, EN15804'.

In-house rework material generated during production is collected, reprocessed on site and returned to the manufacturing process. For allocation purposes, the reprocessing burden of this material, mainly electricity used during regranulation and related handling, is assigned according to the polluter pays principle. This means that the product system generating the rework material carries the burden required to make it suitable for reuse in production, rather than transferring this burden to the subsequent process where the rework material is consumed. The material is therefore treated as an internal closed-loop rework flow within the manufacturing system and not as externally sourced recycled material.

GWP-GHG intensity of recycled material: Nothing to report

Data quality: Specific data is determined by its contribution to the total GWP indicator within the "specific" data category. In stages A1-A3, the following data point types are classified as "specific":

1. EPDs and private data points.
2. Processes including energy, transport, and direct process emissions.

"Manufacturing waste" is treated as generic data as a conservative approach, acknowledging potential use of generic information due to data limitations in some scenarios.

The percentage of specific data used is calculated as:

$$\text{Specific data used (\%)} = (\text{GWP-fossil of all specific data} / \text{GWP-fossil of A1-A3}) * 100$$

In this EPD study, the percentage of specific data utilized is: 87.9 %.

The share of primary data is calculated based on GWP-GHG results. It is simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicators do not capture all relevant aspects of data quality and is not comparable across product categories.

The primary data used in this LCA study cover one full calendar year of operation, corresponding to the 2025 reference year.

Hotspot Analysis: The hotspot analysis was performed for the declared A1–A3 GWP-GHG result. The A1–A3 GWP-GHG result is 274 kg CO₂ eq. per declared unit; therefore, the 10% relevance threshold is 27.4 kg CO₂ eq. The processes exceeding this threshold are A1 raw material supply, mainly polypropylene resin and other fossil-based inputs, and A3 manufacturing energy, mainly grid electricity used during staple fibre and needle-punched nonwoven fabric production. Packaging, inbound transport, production waste treatment, photovoltaic electricity and natural gas are included in the model, but are not identified as separate >10% contributors based on the available contribution screening.

Process / data point contributing >10% to A1–A3 GWP-GHG	Polypropylene resin and other fossil-based raw materials	Manufacturing energy, mainly grid electricity	Other A1–A3 processes below the 10% threshold
Module	A1	A3	A1–A3
Main primary data used	Bill of materials, declared product mass, raw material input quantities, supplier/material information, production losses	Site-specific 2025 energy consumption: 147.0 kWh grid electricity, 27.1 kWh photovoltaic electricity and 96.4 MJ natural gas per declared unit	Packaging quantities, raw material transport distances, production waste data and ancillary flows
Source type	Collected data + EPD/database	Collected data + database	Collected data + database
Source	EPD owner production data; supplier/material information; EPD for PP resin used; ProBas and ecoinvent datasets for polymer/additive inputs	EPD owner energy data; ecoinvent electricity, medium voltage, residual mix, Greece; ecoinvent photovoltaic electricity dataset; ecoinvent natural gas heat dataset	EPD owner data; ecoinvent / One Click LCA background datasets
Reference year	2025 activity data; 2023–2025 background data	2025 activity data; 2024 background datasets	2025 activity data; 2024–2025 background datasets
Data category	Primary activity data with secondary environmental data	Primary activity data with representative secondary environmental data	Mixed primary activity data and secondary environmental data
Estimated contribution to A1–A3 GWP-GHG	Approx. 50–55%	Approx. 117 kg CO ₂ eq., or 42.8%	Individually <10%
Share of contribution from primary data	Activity data primary; upstream production datasets secondary unless supplier-specific EPD data are used	Activity data primary; energy/fuel emission factors from database	Not reported per process
Representativeness and data quality comment	Very good inventory representativeness because the product composition is based on 2025 production data. Environmental data quality is good to very good.	Very good inventory representativeness because energy consumption is based on site-specific 2025 data. Environmental data quality is very good to good.	Included for completeness. These flows do not represent principal hotspots for A1–A3 GWP-GHG based on the available interpretation.

Modelling of infrastructure/capital goods: The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

Cut-off rules: The management of the packaging waste is excluded from this LCA study as it falls under A5 module, which is excluded from this Type A EPD. However, the biogenic carbon embodied in the packaging of the product is manually offset in A3 module, as instructed by PCR 2019:14 V2.0.1, Annex 2.

The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

Electricity modelling: Purchased grid electricity is modelled using the Greek residual mix, medium voltage, with a GWP-GHG intensity of 0.76 kg CO₂e/kWh. On-site photovoltaic electricity is modelled with a GWP-GHG intensity of 0.0672 kg CO₂e/kWh.

Characterization methods for all declared environmental performance indicators: Characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1 have been used throughout the study.

DESCRIPTION OF UPSTREAM AND CORE PROCESSES:

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts of raw material supply include emissions generated when raw materials are taken from nature, transported to industrial units for processing and processed, along with waste handling from the various production processes. All major upstream processes are taken into consideration, including infrastructure. Raw material losses are also taken into account. This stage includes all raw materials which end up in the final products.

The considered transportation impacts include exhaust emissions resulting from transportation of raw materials from suppliers to manufacturing facilities as well as the environmental impacts of the production of the diesel used. The manufacturing, maintenance and disposal of the vehicles as well as tyre and road wear during transportation have also been included. The transportation distances and methods were provided by the Manufacturer.

The environmental impacts considered for the production stage cover the manufacturing of materials used in the production but not included in the final products such as packaging materials and other ancillary materials. Also, fuels used by machines, as well as handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study considers also the losses occurring during the manufacturing processes. Also, the transmission losses of energy have been included.

Manufacturing energy scenario documentation

1. Market for heat, district or industrial, natural gas, World, Ecoinvent, 0.0389 kgCO₂e/MJ
2. Electricity, medium voltage, residual mix, Greece, Ecoinvent, 0.76 kgCO₂e/kWh
3. Electricity production, photovoltaic, 3kWp slanted-roof installation, multi-Si, panel, mounted, Greece, Ecoinvent, 0.0672 kgCO₂e/kWh

TRANSPORT AND INSTALLATION (A4-A5)

A2 raw material transport to the production site is included in A1–A3. A4 transport to customer and A5 installation are not declared. Considering the variety of the customers we supply to and the nature of our business model being B2B – thus supplying intermediate companies, rather than end-users – we cannot reliably calculate or estimate the distance to the use/installation site or the methods of transport. We therefore avoid unnecessary inaccuracies and exclude mode A4 (transportation to the customer). The end customer can more easily and reliably calculate this impact when required.

PRODUCT USE AND MAINTENANCE (B1-B7)

Modules B1–B7 are not declared in this EPD. No use-stage energy use, water use, maintenance, repair, replacement or refurbishment is declared for the product.

PRODUCT END OF LIFE (C1-C4)

End of life (C1-C4) - Scenario documentation

Scenario parameter	Value
Collection process: collected separately (kg)	155.2
Collection process: Mixed waste (kg)	0.0
Recovery: re-use (kg)	0.0
Recovery: recycling (kg)	35.7
Recovery: energy recovery (kg)	77.5

Disposal (kg)	41.9
Scenario assumptions e.g. transportation (mode, km) & other	50 km by lorry to waste treatment. End-of-life scenario: 23% recycling, 27% landfill and 50% incineration. C3 represents recycling-related waste processing; C4 represents final disposal by landfill and incineration; Module D reports benefits from recycling and energy recovery.

The end-of-life scenario is based on a representative European treatment split of 23% recycling, 27% landfill and 50% incineration ¹⁾. For the declared unit of 155.2 kg, this corresponds to 35.7 kg sent to recycling, 41.9 kg sent to landfill and 77.5 kg sent to incineration. C2 accounts for transport to waste treatment, C3 accounts for recycling-related waste processing, C4 accounts for final disposal through landfill and incineration, and Module D reports potential benefits from recycling and energy recovery beyond the system boundary.

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

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU	EU	GR	ND	ND	ND	ND	ND	ND	ND	ND	ND	EU	EU	EU	EU	EU
Share of primary data	87.9 %			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-

ENVIRONMENTAL PERFORMANCE

LCA results of the product(s) - main environmental performance results

Mandatory impact category indicators according to EN 15804

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	2,71E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,19E-01	4.92E+01	1.65E+02	-1,50E+02
GWP-fossil	kg CO ₂ eq.	2,73E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,18E-01	4.92E+01	1.65E+02	-1,47E+02
GWP-biogenic*	kg CO ₂ eq.	-2,85E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,65E-04	-1.49E-03	-4.97E-03	0,00E+00
GWP-luluc	kg CO ₂ eq.	1,84E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,94E-04	9.57E-04	3.20E-03	-1,24E-01
ODP	kg CFC 11 eq.	1,65E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,79E-08	1.29E-08	4.30E-08	-4,76E-06
AP	mol H ⁺ eq.	1,05E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,71E-03	8.88E-03	2.97E-02	-6,68E-01
EP-freshwater	kg P eq.	9,76E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,77E-05	2.14E-04	7.17E-04	-5,95E-02
EP-marine	kg N eq.	2,08E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,19E-04	6.81E-03	2.28E-02	-1,06E-01
EP-terrestrial	mol N eq.	2,01E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,00E-02	4.05E-02	1.36E-01	-1,07E+00
POCP	kg NMVO C eq.	8,19E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,29E-03	1.10E-02	3.68E-02	-6,44E-01
ADP-minerals & metals**	kg Sb eq.	3,82E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,35E-06	6.37E-06	2.13E-05	-7,79E-04
ADP-fossil**	MJ	1,06E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E+01	1.11E+01	3.73E+01	-3,84E+03
WDP**	m ³	3,83E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,96E-02	1.40E+00	4.69E+00	-3,85E+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															

* As per the requirements of PCR 2019:14 version 2.0.1, section 4.8.5, the uptake and emissions of biogenic carbon dioxide (CO₂) has been balanced out within module D, i.e., its contribution to the GWP-biogenic results is declared zero, even though the calculations for GWP-biogenic in module D come out to -3.00E+00 kg CO₂ eq. This does not mean the GWP-biogenic results are zero. When the credit for avoiding production of a material or product is calculated in module D, and the production of that material or product involves an uptake of biogenic CO₂, the calculation considers a corresponding emission of biogenic CO₂.

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

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Packaging production is included in A1-A3. Packaging waste treatment at installation is not declared because module A5 is not declared. The biogenic carbon content of packaging is balanced in A1-A3 in accordance with PCR 2019:14, Annex 2.

Additional mandatory and voluntary impact category indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	2,74E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,18E-01	4.92E+01	1.65E+02	-1,47E+02

Resource use indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	5,88E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,84E-01	6.99E-01	2.34E+00	-3,57E+02
PERM	MJ	5,15E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0.00E+00	0.00E+00	3,03E+01
PERT	MJ	5,93E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,84E-01	6.99E-01	2.34E+00	-3,27E+02
PENRE	MJ	1,03E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E+01	-1.41E+03	-4.70E+03	-4,20E+03
PENRM	MJ	7,08E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-1.07E+01	-3.59E+01	1,20E+03
PENRT	MJ	1,03E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E+01	-1.42E+03	-4.74E+03	-3,00E+03
SM	kg	2,96E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,05E-03	3.59E-02	1.20E-01	4,00E+01
RSF	MJ	4,25E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,67E-05	2.71E-04	9.09E-04	-2,83E-02
NRSF	MJ	6,09E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0.00E+00	0.00E+00	0,00E+00
FW	m ³	1,10E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,62E-03	-2.42E-02	-8.09E-02	-1,38E+00
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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

Waste indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	8,66E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,74E-02	4.74E-01	1.59E+00	-7,28E+00
Non-hazardous waste disposed	kg	5,58E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,56E-01	6.92E+01	2.32E+02	-9,24E+02
Radioactive waste disposed	kg	2,82E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,29E-06	1.10E-05	3.68E-05	-7,69E-03

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Output flow indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0.00E+00	0.00E+00	0,00E+00
Material for recycling	kg	1,51E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	8.21E+00	2.75E+01	0,00E+00
Materials for energy recovery	kg	3,58E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0.00E+00	0.00E+00	0,00E+00
Exported energy, electricity	MJ	4,04E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	2.21E+02	7.41E+02	0,00E+00
Exported energy, thermal	MJ	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	9.32E+01	3.12E+02	0,00E+00

Annex I. 100% scenarios

The table below shows the required impact category indicators, in line with EN 15804, for the end-of-life scenarios of 100% recycling, 100% disposal and 100% incineration:

100% recycling

Mandatory impact category indicators according to EN 15804

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	2,71E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,19E-01	2,59E+01	0,00E+00	-1,57E+02
GWP-fossil	kg CO ₂ eq.	2,73E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,18E-01	2,59E+01	0,00E+00	-1,57E+02
GWP-biogenic	kg CO ₂ eq.	-2,85E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,65E-04	-1,07E-02	0,00E+00	0,00E+00
GWP-luluc	kg CO ₂ eq.	1,84E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,94E-04	1,41E-02	0,00E+00	-2,50E-01
ODP	kg CFC 11 eq.	1,65E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,79E-08	6,90E-08	0,00E+00	-1,87E-06
AP	mol H ⁺ eq.	1,05E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,71E-03	4,06E-02	0,00E+00	-1,01E+00
EP-freshwater	kg P eq.	9,76E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,77E-05	2,63E-03	0,00E+00	-1,01E-01
EP-marine	kg N eq.	2,08E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,19E-04	2,58E-02	0,00E+00	-1,46E-01
EP-terrestrial	mol N eq.	2,01E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,00E-02	1,27E-01	0,00E+00	-1,43E+00
POCP	kg NMVOC eq.	8,19E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,29E-03	3,84E-02	0,00E+00	-4,58E-01
ADP-minerals&metals*	kg Sb eq.	3,82E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,35E-06	9,26E-05	0,00E+00	-1,86E-04
ADP-fossil*	MJ	1,06E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E+01	7,84E+01	0,00E+00	-2,58E+03
WDP*	m ³	3,83E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,96E-02	3,69E+00	0,00E+00	-5,09E+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 on these results are high or as there is limited experienced with the indicator.

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Additional mandatory and voluntary impact category indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ²	kg CO ₂ eq.	2,74E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,18E-01	2,59E+01	0,00E+00	-1,57E+02

² This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Resource use indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	5,88E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,84E-01	1,04E+01	0,00E+00	-5,58E+02
PERM	MJ	5,15E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	5,93E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,84E-01	1,04E+01	0,00E+00	-5,58E+02
PENRE	MJ	1,03E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E+01	-6,51E+03	0,00E+00	-2,58E+03
PENRM	MJ	7,08E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-4,66E+01	-5,18E+00	0,00E+00
PENRT	MJ	1,03E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E+01	-6,55E+03	-5,18E+00	-2,58E+03
SM	kg	2,96E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,05E-03	5,16E-01	0,00E+00	-2,65E-01
RSF	MJ	4,25E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,67E-05	4,19E-03	0,00E+00	-1,22E-03
NRSF	MJ	6,09E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	1,10E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,62E-03	5,62E-02	0,00E+00	-1,98E+00
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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

Waste indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	8,66E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,74E-02	1,64E+00	0,00E+00	-1,16E+01
Non-hazardous waste disposed	kg	5,58E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,56E-01	5,06E+01	0,00E+00	-4,93E+02
Radioactive waste disposed	kg	2,82E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,29E-06	1,72E-04	0,00E+00	-1,31E-02

Output flow indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	1,51E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,55E+02	0,00E+00	0,00E+00
Materials for energy recovery	kg	3,58E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	4,04E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	9,62E+02	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	4,05E+02	0,00E+00	0,00E+00

100% landfilling

Mandatory impact category indicators according to EN 15804

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	2,71E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,19E-01	0,00E+00	1,86E+01	0,00E+00
GWP-fossil	kg CO ₂ eq.	2,73E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,18E-01	0,00E+00	1,86E+01	0,00E+00
GWP-biogenic	kg CO ₂ eq.	-2,85E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,65E-04	0,00E+00	-9,77E-03	0,00E+00
GWP-luluc	kg CO ₂ eq.	1,84E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,94E-04	0,00E+00	1,13E-03	0,00E+00
ODP	kg CFC 11 eq.	1,65E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,79E-08	0,00E+00	4,48E-08	0,00E+00
AP	mol H ⁺ eq.	1,05E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,71E-03	0,00E+00	1,23E-02	0,00E+00
EP-freshwater	kg P eq.	9,76E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,77E-05	0,00E+00	1,83E-04	0,00E+00
EP-marine	kg N eq.	2,08E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,19E-04	0,00E+00	4,11E-02	0,00E+00
EP-terrestrial	mol N eq.	2,01E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,00E-02	0,00E+00	5,03E-02	0,00E+00
POCP	kg NMVO C eq.	8,19E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,29E-03	0,00E+00	2,19E-02	0,00E+00
ADP-minerals&metals*	kg Sb eq.	3,82E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,35E-06	0,00E+00	3,91E-06	0,00E+00
ADP-fossil*	MJ	1,06E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E+01	0,00E+00	3,85E+01	0,00E+00
WDP*	m ³	3,83E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,96E-02	0,00E+00	1,89E-01	0,00E+00
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 on these results are high or as there is limited experienced with the indicator.

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Additional mandatory and voluntary impact category indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ³	kg CO ₂ eq.	2,74E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,18E-01	0,00E+00	1,86E+01	0,00E+00

³ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Resource use indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	5,88E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,84E-01	0,00E+00	6,03E-01	-5,58E+02
PERM	MJ	5,15E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	5,93E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,84E-01	0,00E+00	6,03E-01	-5,58E+02
PENRE	MJ	1,03E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E+01	0,00E+00	-6,04E+03	-2,58E+03
PENRM	MJ	7,08E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-4,66E+01	0,00E+00
PENRT	MJ	1,03E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E+01	0,00E+00	-6,08E+03	-2,58E+03
SM	kg	2,96E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,05E-03	0,00E+00	1,39E-02	-2,65E-01
RSF	MJ	4,25E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,67E-05	0,00E+00	2,61E-04	-1,22E-03
NRSF	MJ	6,09E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	1,10E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,62E-03	0,00E+00	-5,73E-01	-1,98E+00
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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

Waste indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	8,66E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,74E-02	0,00E+00	6,77E-02	-1,16E+01
Non-hazardous waste disposed	kg	5,58E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,56E-01	0,00E+00	7,70E+02	-4,93E+02
Radioactive waste disposed	kg	2,82E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,29E-06	0,00E+00	9,37E-06	-1,31E-02

Output flow indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	1,51E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	3,58E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	4,04E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	9,62E+02	0,00E+00
Exported energy, thermal	MJ	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	4,05E+02	0,00E+00

100% Incineration

Mandatory impact category indicators according to EN 15804

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	2,71E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,19E-01	0,00E+00	4,06E+02	-1,57E+02
GWP-fossil	kg CO ₂ eq.	2,73E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,18E-01	0,00E+00	4,06E+02	-1,57E+02
GWP-biogenic	kg CO ₂ eq.	-2,85E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,65E-04	0,00E+00	-2,69E-03	0,00E+00
GWP-luluc	kg CO ₂ eq.	1,84E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,94E-04	0,00E+00	1,22E-03	-2,50E-01
ODP	kg CFC 11 eq.	1,65E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,79E-08	0,00E+00	5,58E-08	-1,87E-06
AP	mol H ⁺ eq.	1,05E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,71E-03	0,00E+00	5,19E-02	-1,01E+00
EP-freshwater	kg P eq.	9,76E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,77E-05	0,00E+00	5,54E-04	-1,01E-01
EP-marine	kg N eq.	2,08E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,19E-04	0,00E+00	2,52E-02	-1,46E-01
EP-terrestrial	mol N eq.	2,01E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,00E-02	0,00E+00	2,66E-01	-1,43E+00
POCP	kg NMVOC eq.	8,19E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,29E-03	0,00E+00	6,61E-02	-4,58E-01
ADP-minerals & metals*	kg Sb eq.	3,82E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,35E-06	0,00E+00	1,07E-05	-1,86E-04
ADP-fossil*	MJ	1,06E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E+01	0,00E+00	4,00E+01	-2,58E+03
WDP*	m ³	3,83E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,96E-02	0,00E+00	1,04E+01	-5,09E+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 on these results are high or as there is limited experience with the indicator.

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Additional mandatory and voluntary impact category indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ⁴	kg CO ₂ eq.	2,74E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,18E-01	0,00E+00	4,06E+02	-1,57E+02

⁴ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Resource use indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	5,88E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,84E-01	0,00E+00	9,77E-01	-5,58E+02
PERM	MJ	5,15E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	5,93E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,84E-01	0,00E+00	9,77E-01	-5,58E+02
PENRE	MJ	1,03E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E+01	0,00E+00	-5,97E+03	-2,58E+03
PENRM	MJ	7,08E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-5,18E+01	0,00E+00
PENRT	MJ	1,03E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E+01	0,00E+00	-6,03E+00	-2,58E+03
SM	kg	2,96E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,05E-03	0,00E+00	6,79E-02	-2,65E-01
RSF	MJ	4,25E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,67E-05	0,00E+00	2,84E-04	-1,22E-03
NRSF	MJ	6,09E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	1,10E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,62E-03	0,00E+00	7,37E-02	-1,98E+00
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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

Waste indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	8,66E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,74E-02	0,00E+00	3,33E+00	-1,16E+01
Non-hazardous waste disposed	kg	5,58E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,56E-01	0,00E+00	1,63E+02	-4,93E+02
Radioactive waste disposed	kg	2,82E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,29E-06	0,00E+00	1,13E-05	-1,31E-02

Output flow indicators

Results per declared unit (per 1000m ²)																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	1,51E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	3,58E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	4,04E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	9,62E+02	0,00E+00
Exported energy, thermal	MJ	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	4,05E+02	0,00E+00

Additional LCA results (other environmental performance results) of the product(s)

Variation of impact between minimum and maximum impact products have been calculated and is presented in the below table. The variation is primarily attributed to packaging difference between different products.

Variation Information

LCA result of one declared unit product (A-C)	Unit	Min	Representative / Average	Max
GWP – total1)	kg CO2 eq.	2.51E+02	4.86E+02	5.85E+03
GWP – fossil	kg CO2 eq.	2.52E+02	4.88E+02	5.88E+03
GWP – biogEnic	kg CO2 eq.	-1.43E+00	-2.86E+00	-3.56E+01
GWP – LULUC	kg CO2 eq.	1.43E-01	1.88E-01	7.85E-01
OzonE dEplEtion pot.	kg CFC 11 eq.	8.54E-06	1.66E-05	1.96E-04
Acidification potEntial	mol H+ eq.	5.50E-01	1.09E+00	1.25E+01
EP-frEshwatEr2)	kg P eq.	5.01E-02	9.86E-02	1.12E+00
EP-marinE	kg N eq.	1.23E-01	2.39E-01	2.71E+00
EP-tErrEstrial	mol N eq.	1.13E+00	2.20E+00	2.52E+01
POCP (“smog”)3)	kg NMVOC eq.	4.41E-01	8.71E-01	1.00E+01
ADP-minErals & mEtals4)	kg Sb eq.	1.98E+02	3.82E+02	4.59E+03
ADP-fossil rEsourcEs	kg CO2 eq.	5.47E+03	1.07E+04	1.26E+05
WatEr usE5)	kg CO2 eq.	1.93E+02	3.89E+02	4.46E+03

ABBREVIATIONS

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CLC	Co-location centre
CPC	Central product classification
GHS	Globally harmonized system of classification and labelling of chemicals
GRI	Global Reporting Initiative
SVHC	Substances of Very High Concern
ND	Not Declared
EU	Europe
GR	Greece

REFERENCES

- a) EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.
- b) One Click LCA – Life Cycle Assessment software and database, used for modelling the product system.
- c) Ecoinvent database v3.10–3.12, used for background LCA data
- d) EPD International. 2025. General Programme Instructions for the International EPD System, Version 5.0.1. Published 2025-02-27
- e) PCR 2019:14 Construction products, Version 2.0.1. International EPD System.
- f) Plastics Europe. 2022. The Circular Economy for Plastics – A European Overview. Plastics Europe, based on 2020 data. Data by Conversio Market & Strategy GmbH

VERSION HISTORY

Version 1, 2021-02-18

Original Version of the EPD according to the PCR 2012:01, v.2.33

Version 2, 2026-07-01

Differences versus the previously published version: transition to the PCR 2019:14, v2.0.1, 2nd 5-year publication cycle.

