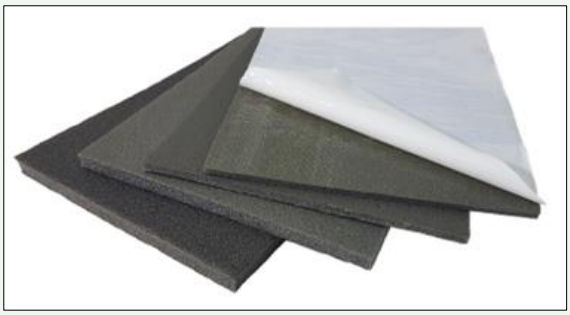
Environmental Product Declaration

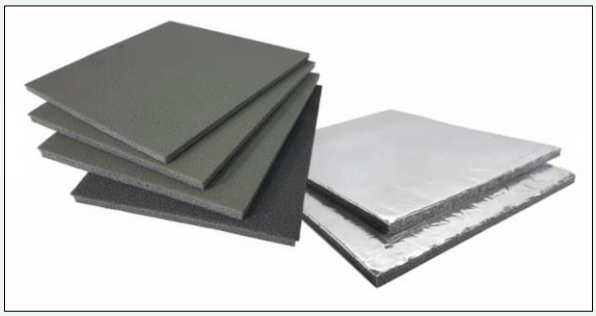
In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

OSIOCELL FR/M adhesive 5-6-8-10-12-14mm
OSIOCELL FR/AL adhesive 5-6-8-10-12-14-16-18-20mm

from

G.L. S.r.l. - FEINROHREN Group





Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of multiple products, based on the average results of the product group
EPD registration number:	EPD-IES-0027760:001
Version date:	2026-01-30
Validity date:	2031-01-29

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

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): Construction Products, 2019:14, version 2.0.1, UN CPC 369 "Other plastics products"
PCR review was conducted by: The Technical Committee of the International EPD® System. Review chair: Rob Rouwette (chair), Noa Meron (co-chair). The review panel may be contacted via support@environdec.com.
c-PCR: Thermal insulation products, c-PCR-005, version 1.0.0

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: *DNV Business Assurance Italy S.r.l. - Via Energy Park 14, 20871 Vimercate (MB)* Approved by: Accredia, accreditation n. 00010VV rev.4
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/functional 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 characterisation 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: G.L. S.r.l.
Address: SP ex SS 525 del Brembo, 11, 24040 Osio Sopra (BG), Italy
Contact: milena@gl-srl.com
Address and contact information of the LCA practitioner commissioned by the EPD owner:
lara.belleri@regula.biz - Via della Volta 90, 25124 Brescia (BS), Italy

Description of the organisation: G.L. S.r.l. carries out the manufacture, conversion, processing, finishing (including coating/painting), and molding of plastic materials of various types and geometries. It also processes rubber and other rigid materials. In particular, it manufactures cross-linked polyethylene foam insulation mats for HVAC and building applications.

In addition to the main manufacturing site located in SP ex SS 525 del Brembo, G.L. S.r.l. operates a secondary facility located at Via I Maggio 43, Osio Sopra (BG) Italy.
This site hosts a production department dedicated to die-cutting, cutting and hot lamination of expanded materials with related warehousing and shipping activities.
This site is not involved in the manufacturing processes of the products covered by this EPD and is therefore excluded from the LCA system boundaries and results.

Product-related or management system-related certifications: ISO 9001 certification.

PRODUCT INFORMATION

Product name: OSIOCELL FR/M and OSIOCELL FR/AL – Cross-linked expanded polyethylene (PE) self-adhesive products.
Product identification: Insulating product for building and HVAC applications
UN CPC code: UN CPC 369 “Other plastics products”
Product description: The product covered by this Environmental Product Declaration (EPD) is the OSIOCELL range of closed-cell cross-linked polyethylene foam (PE) insulation, specifically the FR/M and FR/AL adhesive variants. This product is classified under the Construction Products PCR 2019:14 issued by the International EPD System and falls within the CPC 369 category, designated as "Other plastic products."

OSIOCELL is an insulation material designed for thermal and anti-condensation insulation of building service equipment and industrial installations, adhering to the standard EN 14313:2015. The intended use is primarily to minimize heat losses in heating and hot water systems and to prevent energy gains and surface condensation in cooling and refrigeration systems.
The core functionality of the product is delivered by its closed-cell structure, which is manufactured via the chemical expansion and cross-linking of polyolefin resins. This process yields a material with a nominal density of 28 ± 10% kg/m^3. Key technical attributes include high thermal efficiency and resistance to water vapor diffusion with μ > 3000 ensuring durability and long-term use.
All the products in the FR/M and FR/AL families are treated with fire-retardant additives, which provide an increased resistance to ignition and flame propagation.
The variants FR/M 14 mm and FR/AL 5 mm are likewise treated, however, they are not currently included within the scope of the available reaction-to-fire classification reports. The certified variants achieve a reaction-to-fire class of B-s2-d0 or C-s2-d0, depending on product type and thickness.

The product is supplied in self-adhesive rolls, facilitating quick and secure installation across various shapes and sizes of piping and ductwork. There are no general restrictions related to the type of construction applications.

Table 1: Technical data

Technical Characteristics	Standard	Unit	FR/M	FR/AL
Density	ISO 845	Kg/m³	28+-10%	28+-10%
Thickness*	–	mm	from 3 to 15	from 5 to 20
Aluminium Foil Thickness	–	μm	–	40
Dimensional Stability	ISO 2796	°C	95	95
Tensile Strength	ISO 1798	MPa	Long. 0.17 / Transv. 0.20	Long. 0.28 / Transv. 0.22
Elongation at Break	ISO 1798	%	Long. 99.7% / Transv. 103.5%	Long. 139.9% / Transv. 136.7%

Technical Characteristics	Standard	Unit	FR/M	FR/AL
Compression Strength	ISO 3386-1	kPa	10%: 17,15 25%: 36.03 50%: 94.1	10%: 16.20 25%: 36.17 50%: 96.28
Water Absorption after 28 days	ISO 2896	%	< 3	< 3
Water Vapour Transmission	EN 12086	μ	> 3000	> 3000
Fire Reaction Class	EN 14313	–	3-12: B-s2-d0	6-15: B-s2-d0 16-20: C-s2-d0

While a specific technical lifespan is not explicitly declared, the durability and performance stability of the product suggest an expected service life commensurate with the building's operational period, assuming it is correctly installed and protected from external mechanical damage.

Manufacturing takes place at the G.L. S.R.L. facility in Osio Sopra, Italy. The process begins with the extrusion and chemical foaming of the polyolefin material, followed by cross-linking under heat to form the stable closed-cell structure. The base material is then cut or coupled to obtain various thicknesses (ranging from 3 mm up to 20 mm) and undergoes a final lamination stage where protective facings (such as the 40-micron Aluminium sheet for the FR/AL variants) and the adhesive backing are applied through a hot coupling process.

Family Product 1: OSIOCELL FR/M 5-6-8-10-12-14mm
Chemically cross-linked, closed cell polyethylene foam, nominal density 28 kg/m^3, one adhesive side, anthracite color.

Family Product 2: OSIOCELL FR/AL 5-6-8-10-12-14-16-18-20mm
Chemically cross-linked, closed cell polyethylene foam, nominal density 28 kg/m^3, one adhesive side, multilayer for thicknesses 16-18-20mm, laminated with a 40μm aluminum sheet, anthracite color.

CONTENT DECLARATION

This EPD is and EPD pf multiple products, base on the average results of the product group. Therefore, in accordance with the PCR for Construction Products 2019:14 (v2.0.1) the average (mean) content is declared.

The average material composition and packaging content of the products included in the analysis are reported in Table 2*.
The table also shows the minimum and maximum content observed for each material category and for the total product mass, as well as the biogenic carbon content of the packaging materials.
The material composition and the packaging materials are expressed in kg per 1 m² of product. The biogenic carbon content of the packaging materials is expressed in kg C per 1 m².

Table 2: average material composition of Osiocell FR/M adhesive, from 5mm to 14mm, and of FR/AL adhesive, from 5mm to 20mm.*

Product content	Average mass, kg	Mass range (kg)		Average %	Post consumer recycled material, mass-%	Biogenic material, Mass-%	Biogenic material kg C/declared unit
Polymers	0,14	0,045	0,31	29	0	0	0
Additives	0,15	0,069	0,26	29	0	0	0
Flame retardants	0,039	0,0075	0,11	7,8	0	0	0
Adhesive components	0,11	0,11	0,11	21	0	0	0
Aluminium	0,065	0	0,11	13	0	0	0
TOTAL	0,50	0,23	0,89	100	0	0	0
Packaging materials	Average mass, kg	Mass range (kg)		Average mass-% (versus the product)	Biogenic material kg C/declared unit		
PE film	0,0019	0,0013	0,0026	0,38%	0		
Cardboard tube	0,014	0,014	0,014	2,8%	0,0056		
TOTAL	0,016	0,015	0,017	3,2%	0,0056		

- No substances of very high concern (SVHC) in concentrations above 0.1% w/w, as defined by the REACH Regulation (EC) No. 1907/2006, are present in the product formulation.

**Values are reported with two significant figures in accordance with the PCR for Construction Products 2019:14 (v2.0.1).*

LCA INFORMATION

Declared unit: 1 m² of product.

Conversion factor: conversion factors from m² to kg are based on actual product formulations and input recipes, rather than on the theoretical value calculated from nominal density (e.g. ρ = 28 kg/m³).

Table 3: FR/M conversion factor

OSIOCELL FR/M	5 mm	6 mm	8 mm	10 mm	12 mm	14 mm
Conversion factor from m² to kg*	0,255	0,285	0,345	0,405	0,465	0,525

Table 4: FR/AL conversion factor

OSIOCELL FR/AL	5 mm	6 mm	8 mm	10 mm	12 mm	14 mm	16 mm	18 mm	20 mm
Conversion factor from m² to kg*	0,363	0,393	0,453	0,512	0,572	0,631	0,692	0,752	0,811

Reference service life: not applicable

Database and LCA software used:
The LCA model was developed using SimaPro (version 10.20.2) and datasets from ecoinvent (version v3.11, system model: cut-off).
The modelling and impact assessment were carried out in accordance with EN 15804+A2:2019 and the applicable Product Category Rules PCR 2019:14, version 2.0.1.

Description of system boundaries:
The impact assessment covers cradle-to-gate with modules C1-C4 and module D.
Modules A4–A5 (transport to site and installation) and modules B1–B7 (use stage) are excluded from the assessment as these life-cycle stages are outside the operational control of the manufacturer and no reliable, product-specific data are available.

Table 5: Description of the system stages

Life-cycle stages	Modules information
A1-A3: Product stage	A1) Raw material and packaging supply
	A2) Raw material and packaging transportation
	A3) Manufacturing of product
C1-C4: End-of-life stage	C1) Deconstruction, demolition
	C2) Transport of demolition waste
	C3) Waste treatment
	C4) Final landfill disposal

Geographical scope:

The geographical scope of the LCA model is Global due to global datasets involved in the analysis, the focus areas are EU and Italy, in particular:

- **A1 (raw materials supply):** modelled using ecoinvent datasets for the RER (Europe) region whenever available; GLO (global) datasets were used for materials without regional coverage.
- **A2 (raw materials transport):** represented by RER datasets reflecting European transport conditions.
- **A3 (manufacturing):** based on site-specific data from Italy, supplemented with RER, GLO, and datasets from neighbouring European countries to reflect actual supply chains.
- **C1 and C3:** declared as zero according to the assumptions.

- **C2 (transport to disposal) and C4 (disposal):** modelled with RER datasets to represent typical European end-of-life scenarios.

- **D:** there are no benefits and the end of life.

Assumptions

The following assumptions have been applied in the modelling:

• **Module C1 (demolition):** impacts associated with the demolition stage are considered negligible. The removal of the product does not require electricity or other energy inputs and can generally be performed manually.

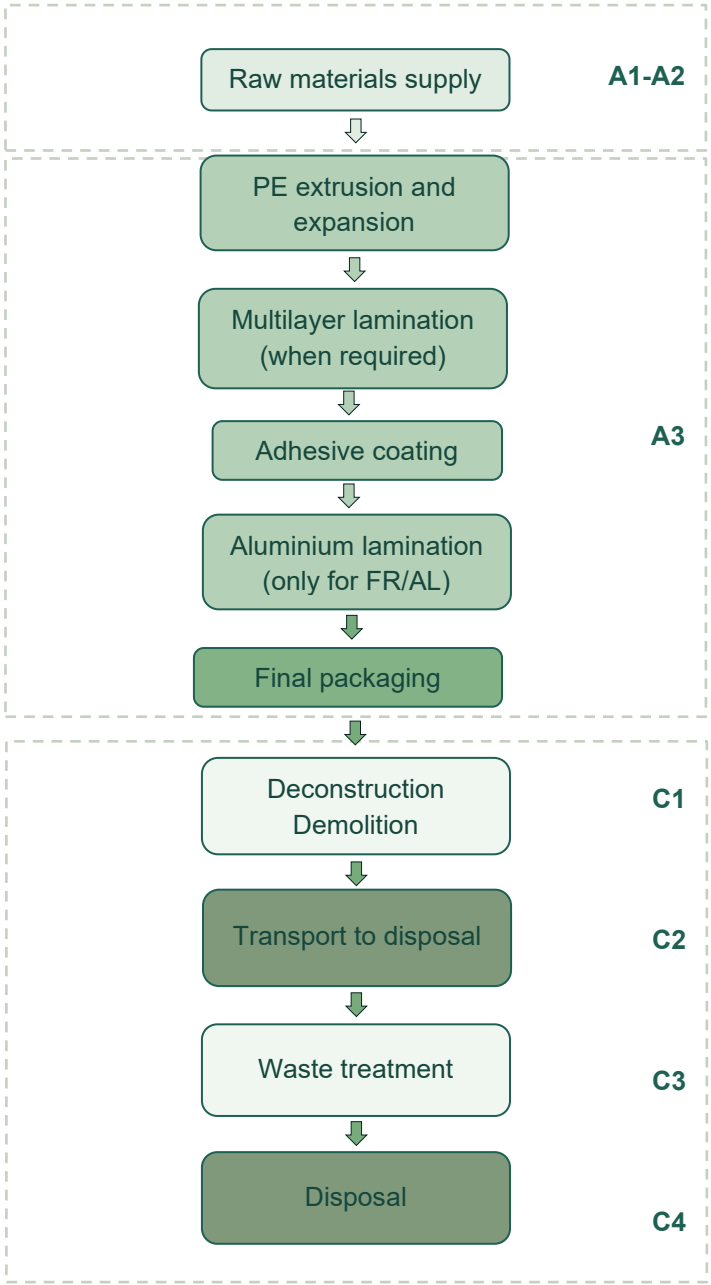
• **Module C2 (transport to disposal):** A default transport distance of 80 km has been assumed for the delivery of waste to landfill (not to be incinerated), in accordance with the default data defined in Table 4 of the PCR for Construction Products (EPD International 2019:14, v2.0.1).

• **Module C3 (waste treatment):** the product is not recovered or treated for recycling after removal.

• **Module C4 (disposal):** at the end of its life, the product is expected to be disposed of with other construction waste in a controlled sanitary landfill. A default energy carrier of 1,6 kWh/tonne has been assumed for the compacting of inert waste in accordance with the default data defined in Table 4 of the PCR for Construction Products (EPD International 2019:14, v2.0.1).

• **Module D (benefits and loads beyond the system boundary):** the result for module D is zero, since no benefits from recycling, recovery, or reuse are considered at the end of life.

Process flow diagram



Interpretation of results

The results show that the environmental impacts are largely dominated by the production stage (modules A1–A3), with raw material supply representing the most critical contribution across all impact categories, in particular for GWP-GHG and resource use. Manufacturing energy plays a secondary role, while transport and end-of-life stages have only a marginal influence. Potential improvement actions mainly relate to optimising raw material formulations and increasing the use of lower-impact and renewable energy sources in production.

Data quality assessment

The study prioritised the use of primary data directly collected from the manufacturer, in accordance with the requirements of EN 15804:2012+A2:2019, Annex E, EN 15941, and the PCR *Construction Products* (EPD International 2019:14, v2.0.1). Primary data were organised by life cycle module and environmental indicator, consistently with the structure of the declared LCA results.

Results of the assessment:

Temporal representativeness is considered **Good** overall. Primary data for production volumes, energy and water consumption, emissions and waste generation refer to the 2024 calendar year, which represents the reference period of the study. The allocation of energy and resource consumption among process stages is based on a site-specific energy audit carried out in 2017 and confirmed through subsequent internal assessments, with no significant changes in production technology observed up to 2024. Background datasets from ecoinvent v3.11 (released in 2024) include data from a range of reference years, with many electricity and fuel datasets updated up to 2023.

Geographical representativeness of primary data is **Good** overall, with some Fair/Poor ratings for upstream materials due to the use of global datasets. All foreground data were collected at the manufacturer's production site in Italy and reflect actual operating conditions. Background data were sourced from ecoinvent v3.11 using datasets with Italian (IT), European (RER), Swiss (CH) or global (GLO) geographical scope, depending on data availability and the specific process modelled. Where European or Italian datasets were available, these were preferred; global datasets were used only when more specific geographical data were not available.

Technological representativeness is **Good to Very good** overall, since it is high for primary data, as they describe the actual production technology and equipment currently in operation at the manufacturing site, including extrusion, lamination, adhesive coating and auxiliary processes. The production equipment and technological setup have remained substantially unchanged since 2017, ensuring continuity and consistency between the reference year of the study and the data used. Secondary datasets from ecoinvent represent the same or comparable technologies and are considered appropriate for modelling upstream and downstream processes.

Completeness and consistency: All relevant input and output flows within the defined system boundaries were included in the model, covering raw materials, energy and water consumption,

emissions to air, and production waste. Any excluded flows are considered negligible and do not affect the overall results.

Reliability: Full primary data coverage (100%) is available for electricity, natural gas and water consumption in module A3. Secondary data were sourced from the ecoinvent v3.11 database, which provides transparent, peer-reviewed and quality-assured datasets developed in accordance with ISO 14040/44.

Data group	Module(s)	Data category	GR	TR	TiR
Manufacturing processes and energy use (site-specific)	A3	Primary data	1	1	1
Raw material production (polymers and additives)	A1	Representative secondary / proxy	2–4	2–3	2–3
Aluminium production and processing	A1	Representative secondary	2	2	2
Packaging materials	A1–A3	Representative secondary	2–4	2	2
Transport processes	A2, C2	Representative secondary	2–3	1–2	2
End-of-life treatment	C4	Representative secondary	1–3	2	3

Table 6

The data groups listed above together contribute to more than 80% of the results of each declared environmental impact indicator. A more detailed data quality assessment is documented in the LCA report.

Table 7: 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	GLO	EU	IT										EU	EU	EU	EU	EU
Share of primary data	19,80%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	73%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0					-	-	-	-	-	-	-	-	-	-	-	-

In accordance with the PCR *Construction Products* (2019:14, v2.0.1), the GWP-GHG indicator was calculated by applying the EN 15804+A2 GWP-total characterization factors while excluding the contribution of biogenic CO_2. The indicator was implemented in SimaPro and used consistently for all declared life cycle modules.

Table 8 summarises the contribution of the main process groups to the GWP-GHG results of modules A1–A3 and the corresponding share of primary data for the average product.

Table 8: Share of primary data, of GWP-GHG results for A1-A3:

Process / data group	Module	Source type	Source	Reference year(s)	Data category (PCR)	Contribution to GWP-GHG A1–A3 [%]	Share of primary data in GWP-GHG A1–A3 [%]
Production of raw materials (polymers, additives, aluminium, packaging)	A1	Databases	ecoinvent v3.11 (GLO, RER, EU)	ca. 2015–2023	Representative secondary data, proxy data	75,41	0
Transport of raw materials to manufacturing site	A2	Databases (PCR vehicle type and default distances)	ecoinvent v3.11, “freight lorry 16–32 t, EURO 5”	ca. 2015–2022	Representative secondary data	0,22	0
Manufacturing of product – energy, fuel and water (site processes)	A3	Collected data + databases	Site measurements (2024); electricity IT, heat RER, tap water EU from ecoinvent v3.11	2024 (activity data), ca. 2015–2022 (LCI)	Primary data	19,80	19,80
Manufacturing of product – other processes (packaging, waste treatment, auxiliaries, etc.)	A3	Databases / proxy models	ecoinvent v3.11; proxy datasets for additives, adhesive, films; waste treatment datasets	ca. 2015–2023	Representative secondary data, proxy data	4,58	0
Total share of primary data for GWP-GHG (A1–A3)							19,80

The share of primary data is calculated based on GWP-GHG results. It is a 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 indicator does not capture all relevant aspects of data quality and is not comparable across product categories.”

Characterisation methods:
All environmental performance indicators have been calculated according to EN 15804+A2:2019, using the Environmental Footprint (EF) 3.1 reference package (February 2023).
Characterisation factors are consistent with the latest implementation of the Product Environmental Footprint (PEF) method as defined by the European Commission (JRC).

Allocation method: by mass
Where a unit process serves more than one flow, impacts are allocated by mass of each flow within the system boundaries (per EN 15804/PCR ”Contruction Products” **2019:14 version 2.0.1.**).
If primary, product-specific measurements are available for a process, allocation is not applied.

Co-product allocation:
PE production scrap generated during manufacturing is shredded and sold as secondary material. Its economic significance was assessed and found to be below 10% of the finished product value. In line with the PCR Construction Products 2019:14 v2.0.1, the scrap is treated using a co-product allocation approach by conservatively assuming zero economic value at the point of separation. Consequently, no environmental burdens or benefits are allocated to the co-product, and no recycling credits are claimed in the declared results.

Cut-off approach:
The LCA study was performed in compliance with the cut-off criteria of EN 15804 and ISO 14044. Further details are provided in the LCA report.

Electricity information:
Electricity consumption at the production site is based on a company-specific mix consisting of 91.31% Italian AIB 2025 residual grid electricity and 8.69% self-consumed photovoltaic electricity, resulting in a climate impact of 0.664 kg CO_2 eq per kWh (GWP-GHG).

ENVIRONMENTAL PERFORMANCE

LCA results of the products

Average results for OSIOCELL FR/M thickness range: 5-14mm and FR/AL thickness range: 5-20mm.

Mandatory impact category indicators according to EN 15804

Results per 1m² of final product							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	4,15E+00	0,00E+00	7,57E-03	0,00E+00	4,59E-02	0,00E+00
GWP-fossil	kg CO_2 eq.	3,99E+00	0,00E+00	7,57E-03	0,00E+00	4,58E-02	0,00E+00
GWP-biogenic	kg CO_2 eq.	1,51E-01	0,00E+00	4,99E-06	0,00E+00	4,38E-05	0,00E+00
GWP-luluc	kg CO_2 eq.	1,51E-02	0,00E+00	2,51E-06	0,00E+00	1,15E-06	0,00E+00
ODP	kg CFC 11 eq.	1,37E-06	0,00E+00	1,65E-10	0,00E+00	1,55E-10	0,00E+00
AP	mol H^+ eq.	2,06E-02	0,00E+00	2,43E-05	0,00E+00	3,67E-05	0,00E+00
EP-freshwater	kg P eq.	1,33E-03	0,00E+00	5,17E-07	0,00E+00	3,92E-07	0,00E+00
EP-marine	kg N eq.	7,72E-03	0,00E+00	8,18E-06	0,00E+00	1,04E-03	0,00E+00
EP-terrestrial	mol N eq.	4,62E-02	0,00E+00	8,90E-05	0,00E+00	1,65E-04	0,00E+00
POCP	kg NMVOC eq.	1,70E-02	0,00E+00	3,68E-05	0,00E+00	6,92E-05	0,00E+00
ADP-minerals&metals*	kg Sb eq.	9,61E-03	0,00E+00	2,55E-08	0,00E+00	9,99E-09	0,00E+00
ADP-fossil*	MJ	7,17E+01	0,00E+00	1,07E-01	0,00E+00	1,20E-01	0,00E+00
WDP*	m^3	2,00E+00	0,00E+00	5,43E-04	0,00E+00	-9,61E-02	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 1m² of final product							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	4,02E+00	0,00E+00	7,55E-03	0,00E+00	4,58E-02	0,00E+00
PMF*	Disease incident	2,16E-07	0,00E+00	6,05E-10	0,00E+00	8,80E-10	0,00E+00
IRH**	kBq U235 eq.	3,27E-01	0,00E+00	1,28E-04	0,00E+00	2,18E-04	0,00E+00
ETPF*	CTUe	1,18E+02	0,00E+00	1,42E-02	0,00E+00	1,36E-01	0,00E+00
HTC*	CTUh	5,50E-09	0,00E+00	1,29E-12	0,00E+00	1,84E-12	0,00E+00
HTNC*	CTUh	6,38E-08	0,00E+00	6,71E-11	0,00E+00	2,71E-10	0,00E+00
Land use*	Pt	1,15E+01	0,00E+00	6,34E-02	0,00E+00	2,83E-01	0,00E+00
Acronyms		PMF = Particular Matter emissions; IRH = Ionizing radiation, human health; ETPF = Ecotoxicity – fresh water; HTC = Human toxicity, cancer effect; HTCN = Human toxicity, non-cancer effects					

** 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.*
*** This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.*

Resource use indicators

Results per 1m² of final product							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	6,59E+00	0,00E+00	1,75E-03	0,00E+00	3,50E-03	0,00E+00
PERM*	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

[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 CO_2 is set to zero.

PERT	MJ	6,59E+00	0,00E+00	1,75E-03	0,00E+00	3,50E-03	0,00E+00
PENRE	MJ	5,58E+01	0,00E+00	1,07E-01	0,00E+00	1,60E+01	0,00E+00
PENRM*	MJ	1,59E+01	0,00E+00	0,00E+00	0,00E+00	-1,59E+01	0,00E+00
PENRT	MJ	7,17E+01	0,00E+00	1,07E-01	0,00E+00	1,20E-01	0,00E+00
SM	kg	2,80E-02	0,00E+00	4,79E-05	0,00E+00	4,83E-05	0,00E+00
RSF	MJ	7,06E-03	0,00E+00	6,29E-07	0,00E+00	7,95E-07	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	4,94E-02	0,00E+00	1,34E-05	0,00E+00	-2,24E-03	0,00E+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						

**For the PERM and PENRM the new "GUIDANCE TO CALCULATING THE PRIMARY ENERGY USE INDICATORS" in Annex 3 of the PCR is followed and calculated according to option A.*

Waste indicators

Results per 1m² of final product							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	4,77E-01	0,00E+00	1,54E-04	0,00E+00	1,78E-04	0,00E+00
Non-hazardous waste disposed	kg	1,50E+01	0,00E+00	3,30E-03	0,00E+00	2,83E+00	0,00E+00
Radioactive waste disposed	kg	8,34E-05	0,00E+00	3,16E-08	0,00E+00	4,98E-08	0,00E+00

Output flow indicators

Results per 1m² of final product							
Indicator	**Unit**	**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

Material for recycling	kg	3,44E-02	0,00E+00	1,28E-06	0,00E+00	3,46E-06	0,00E+00
Materials for energy recovery	kg	9,94E-06	0,00E+00	6,81E-09	0,00E+00	2,82E-09	0,00E+00
Exported energy, electricity	MJ	2,90E-02	0,00E+00	2,11E-05	0,00E+00	6,36E-05	0,00E+00
Exported energy, thermal	MJ	1,77E-02	0,00E+00	2,59E-05	0,00E+00	7,63E-04	0,00E+00

The environmental performance results are relative expressions and do not predict actual impacts on category endpoints, nor do they indicate threshold exceedance, safety margins, or associated risks.

Variations of results

This EPD represents an average product covering multiple product variants.
Variations of the results were assessed in accordance with the PCR.
The following impact indicators in Table 9, show a variation above 10% across the declared product variants:

Table 9

Environmental impact indicator	Maximum variation [%]
GWP-GHG (A1-A3)	**73%**
GWP-total	74%
GWP-fossil	74%
GWP-biogenic	64%
GWP-LULUC	160%
Ozone depletion (ODP)	4%
Acidification (AP)	72%
Eutrophication, freshwater	77%
Eutrophication, marine	65%
Eutrophication, terrestrial	55%
Photochemical ozone formation (POCP)	63%
Resource use, minerals and metals (ADP)	138%
Resource use, fossils (ADP-fossil)	69%
Water deprivation (WDP)	90%

ABBREVIATIONS

General Abbreviations	
CO_2	Carbon dioxide
EN	European Norm (Standard)
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CPC	Central product classification
GRI	Global Reporting Initiative
SVHC	Substances of Very High Concern
PCR	Product Category Rules
c-PCR	Complementary product category rules
GHG	Greenhouse gas
GWP	Global warming potential
LCA	Life cycle assessment
EF	Environmental Footprint
PEF	Product Environmental Footprint
ND	Not declared

REFERENCES

a) General Programme Instructions of International EPD System, version 5.0.1.
b) EN 15804:2012+A2:2019/AC:2021.
c) ISO 14025:2006.
d) PCR 2019:14. Construction Products, version 2.0.1.
e) c-PCR005 Thermal insulation products, version 1.0.0.
f) Ecoinvent database v3.11 and v3.12.
g) Internal LCA report: G.L. S.r.l., 'LCA Report – FR/M and FR/AL products', Version 2.0, December 2025.
h) MUD 2024 and on-site measurements (2024).
i) G.L. S.r.l. Energy audit 2017 and 2023.
j) Ecoinvent EN 15804 database in SimaPro - User manual.

VERSION HISTORY

Original Version of the EPD, 2026-01-30

EPD
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