ENVIRONMENTAL PRODUCT DECLARATION

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

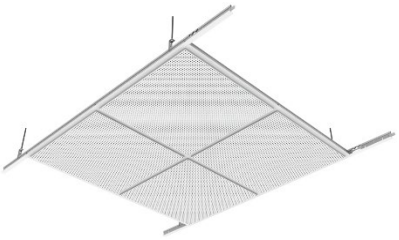
GABELEX CEILING PANELS IN PRE-PAINTED ALUMINIUM

Programme: The International EPD® System, www.environdec.com
Programme operator: EPD International AB
Version: 1.0
Registration number: EPD-IES-0023103

EPD in accordance with ISO 14025:2006, ISO 21930:2017 and EN 15804:2012+A2:2019/AC:2021

Version date: 2025-09-09
Validity date: 2030-09-09

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



CONTENT

- General information
- Information about EPD owner
- Product information
- Content declaration
- LCA information
  - Life Cycle stages
- Environmental performance
  - Mandatory impact category indicators according to EN 15804Resource use
  - Additional mandatory and voluntary impact category indicators
  - Resource use indicators
  - Waste indicators
  - Output flows indicators
- Additional LCA results
- Appendix
- References
- Version history

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 and ISO standard ISO 21930 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 Construction products (EN 15804+A2), version 2.0.1 **UN CPC CODE:** 42190
PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com for a list of members. Chairs of the PCR review: Rob Rouwette (chair), Noa Meron (co-chair)
c-PCR, if applicable: Acoustical ceiling and wall solutions (c-PCR-014; appendix to PCR 2019:14)

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: Katrin Molina-Besch, Miljögiraff AB, katrin@miljogiraff.se Approved by: International EPD System
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: Saint-Gobain Ecophon AB
Address: Box 500 265 03 Hyllinge Sweden
Contact: Carl Eriksson
Address and contact information of the LCA practitioner commissioned by the EPD owner, if applicable: carl.eriksson@ecophon.se
Description of the organisation: Gabelex designs and manufactures metal ceilings and grid systems.
Product-related or management system-related certifications: ISO 354:2003 Acoustics - Measurement of sound absorption in a reverberation room
ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services
Reach: EU REACH Regulation (EC) No 1907/2006
LCA report: LCA Project report Gabelex
EN 15804:2012+A2:2019/AC:2021 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
The International EPD System PCR 2019:14 Construction products and Construction services. Version 2.0.1

PRODUCT INFORMATION

Product name: Gabelex Ceiling Panels in pre-painted aluminium
Product identification:
UN CPC code: 42190
Product description: This Environmental Product Declaration (EPD) describes the environmental impact of 1 m² Ceiling Panels in pre-painted aluminium (metal ceiling) with the intent to increase sound absorption and be decorative in a room and to create a better indoor environment. The raw materials used for production are all from the European Union. Infrastructure is included in secondary data used in the impact calculations. Thanks to its acoustic fleece, the metal ceiling contributes to the absorption of ambient noise and allows acoustic correction to be carried out inside the premises. Intended use is sound absorption and decoration. The lifespan of a Gabelex product is like that of a building, if the component is part of it (often set to 50 years).
Name and location of production site(s): São Martinho (Portugal), PT
References to any relevant websites for more information:
https://www.ecophon.com/en/

CONTENT DECLARATION

The mass (weight) of one unit of a product, as purchased or per declared unit: 2,10 kg / m². The product does not contain any biogenic carbon.

Description of the main product components and materials for 1 m² of Ceiling Panels in pre-painted aluminium:

Parameter	Value	Post-consumer recycled content	Pre-consumer recycled content
Product thickness	0,60 mm	-	-
Product weight	2,10 kg/m²	-	-
Steel weight	0,00E+00 kg/m²	6%	14%
Aluminium weight	2,05E+00 kg/m²	68%	20%
Acoustic fleece weight	5,33E-02 kg/m²	-	-
Packaging plastic weight	5,00E-03 kg/m²	-	-
Packaging cardboard weight	8,90E-02 kg/m²	-	-
Packaging wooden pallet weight	5,20E-01 kg/m²	-	-

Information on the environmental and hazardous/toxic properties of a substances contained in the product: All raw materials contributing more than 5% to any environmental impact are listed in the table above. At the date of issue of this environmental declaration, there is no substance of very high concern (SVHC) in concentration above 0.01% by weight.

The declared share of biogenic/recycled materials:

	Biogenic carbon [kgC/m²]
Packaging	0,25
Product	0

1 kg biogenic carbon is equivalent to 44/12 kg of CO2.

The stored biogenic carbon in the packaging material is as GWP indicator balanced out A5 and zero over the life cycle. The same approch is used for energy stored in the packaging materials.

If future production changes increases GWP-GHG or GWP-total results by more than 10% or f the results of any declared environmental performance indicators are assessed to have increased by 30% or more the EPD will be updated and re-verified.

LCA INFORMATION

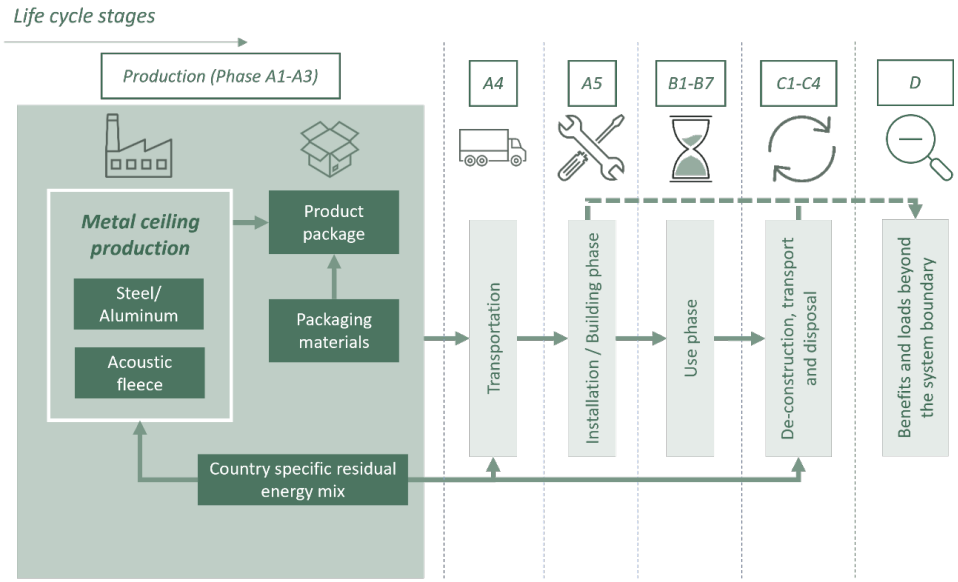
Declared unit	1m² of metal ceiling. Accessories like fasteners are excluded.
System boundaries	Cradle to grave: A1-A3, A4-A5, B, C1-C4 and D This EPD covers the environmental impact of metal ceilings.
Expected product lifetime	50 years
Cut-off rules	The use of cut-off criterion on mass inputs and primary energy at the unit process level (1%) and at the information module level (5%). Flows related to human activities such as employee transport are excluded. Biogenic carbon storage is accounted for in the LCA result related to GWP and included in the “Use of renewable primary energy used as raw materials” All energy stored in “Use of renewable primary energy used as raw materials” is balanced out to zero over the whole life cycle (A to C). The construction of plants, production of machines and transportation systems are excluded since the related flows are supposed to be negligible compared to the production of the building product when compared at these systems lifetime level.
Allocations	Allocation criteria are based on mass in the manufacturing process A3.
Geographical coverage and time period	A1: EU A2: EU A3: Portugal A4-C4: Global (2024)

According to EN 15804, EPD of construction products might not be comparable if they do not comply with this standard. According to ISO 21930, EPD’s might not be comparable if they are from different EPD administrating schemes.

Primary data has been collected by the manufacturer Gabelex according to the one-year collection period during 2023 specified in the demand for manufacturing data.

LCA model, aggregation of data and environmental impact are calculated through the GaBi Professional software. Secondary data is mainly taken from Ecoinvent 3.10 and GaBi Sphera 2025.1 datasets.

Process flow diagram:



This EPD is valid for the Gabelex production facility in São Martinho (Portugal), PT with the plant specific process- and raw material consumption data being collected during 2023. Production mainly includes cold forming of metal into different shapes using roll forming and punching, running on electricity. The electricity used for modelling A3 is country specific residual mix.

As >96% of GWP results from processes A1-A3 the relevance for these modules have been studied and reported in detail. Steel or aluminium is by fat the largest contributor to the overall result with around 92-98% in A1-A3 depending on product material. Remaining 2-8% comes from the acoustic fleece, electricity, transports or packaging which are always relatively small in comparison to steel to aluminium.

To find a best fit for the technology and type of raw material used ion production, German steel datasets where used. This resulted in lower score for geographical representation of steel datasets but is still regarded overall representative. Datasets for transport and packaging are also regarded fair in some respects. Mainly this has to do with place, time and the type of data collected. Since this data only constitute a very limited portion of the overall GWP result, it is not regarded to have any major negative effect on the quality of the overall result.

Data quality assessment of process and dataset information:

Dataset	Source type	Source (database)	Reference year (dataset)	Data category	GR	TecR	TemR	Primary data GWP-GHG A1-A3	Relevance (A1-A3 >96% of total A1-C4)
Aluminum	Collected & Database	Sphera 2025.1	2024	Secondary data	Good	Good	Good	0%	97%
Acoustic fleece	Database	Ecoinvent 3.10	2024	Secondary data	Good	Good	Good	0%	<1%
Electricity	Database	Ecoinvent 3.10	2023	Primary data	Good	Good	Good	2%	2%
Transports	Collected	Saint-Gobain	2021	Primary data	Fair	Fair	Fair	1%	1%
Packaging	Database	Sphera 2025.1/ Ecoinvent 3.10	2024	Secondary data	Fair	Good	Good	0%	<1%

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

	Product phase			Construction process phase		Use phase							End of life phase				Resource recovery phase
	Raw material and supply	Transport to the manufacturer	Manufacturing	Transport to the building site	Installation in the building	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport to waste processing	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	X	X	x	X	X	X	X	X	X	X	X	X	X	X
Geography	EU	EU	PT	GLO	GLO								GLO	GLO	GLO	GLO	GLO
Primary data	3%			-													-
Variation sites	0%			-													-

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.

Product stage, A1-A3

The metal ceiling production stage is divided into three modules: A1, supply of raw materials; A2, transportation and A3, manufacturing. The aggregation of

modules A1, A2 and A3 is a possibility given by standard EN 15 804+A2. This rule is applied to this EPD.

A1 Raw material supply
This module considers the extraction and processing of all raw materials and energy which occur upstream to the studied manufacturing process. In particular, it covers the supply of raw materials for the manufacture of metal and acoustic absorber.

A2 Transport to the manufacturer
Raw materials are transported to the manufacturing site. The modelling includes, for each of the raw materials of road transport (average values).

A3 Manufacturing
The metal ceilings are produced from pre-treated steel or aluminium. The surface treatment consists of either paint or galvanization. The main production steps include shaping the metal into the desired shape. This is done by punching, bending and cold roll forming. After production, products are packaged in cardboard and plastic on top of wooden pallets. 100% of the waste generated in the production cycle is collected and recycled or incinerated with energy recovery in relation to the material and its quality.

Manufacturing includes processes consuming energy in form of electricity. All electricity consumed on the site during manufacturing consists of a special mix purchased from the supplier. However, since no GO is available, country specific residual mix with the environmental impact of 0,585 $kgCO_2$-eq./kWh is used (calculated according to the indicator GWP-GHG).

The packaging flows linked to the production process are included in the manufacturing module: wooden pallets, cardboard and PE film. Apart from the production of packaging material, the delivery and transport of packaging materials are also included in the LCA model. They are reported and allocated in the module where the packages are used. Data on packaging waste generated during this step is recorded.

Location	Electricity emission factor [$kgCO_2$-eq./kWh]
São Martinho (PT)	0,585 [$kgCO_2$-eq./kWh]

Construction process stage, A4-A5

The construction process is divided into 2 modules: A4 “Transport to the building site” and A5 “Installation in the building”.

A4 Transport to the building site

This module includes transport from the production gate to the building site. Transport is calculated based on a scenario with the parameters described in the following table.

Parameter	Value
Fuel type, consumption of fuel and vehicle or vehicle type used for transport	Average truck trailer with a 24t payload, diesel consumption 38 liters for 100 km
Distance	1547 km
Capacity utilisation (including empty returns)	100% of the capacity in volume 30% of empty returns
Bulk density of transported products (if available)	3500 kg/m3
Volume capacity utilisation factor (if available)	0,45

The transport distance has been calculated from a European average transport from Ecophon Gabelex manufacturing in São Martinho (PT) using the parameters in the table above.

A5:1 Installation in the building
This module includes waste of products during the implementation, i.e. the additional production processes to compensate the loss and the waste processing which occur in this stage.

Scenarios used for quantity of product wastage and waste processing are:

Parameter	Value
Waste of materials on the building site before waste processing, generated by the product's installation (specified by type)	Product: 1,05E-01 kg/DU PE film: 5,00E-03 kg/DU Cardboard: 8,90E-02 kg/DU Pallet: 5,20E-01 kg/DU
Transport of packaging waste	Landfill: 80 km Recycling: 80 km
Output materials (specified by type) as results of waste processing at the building site, e.g., of collection for recycling, for energy recovery, disposal (specified by route)	Product losses: 1,05E-01 kg/DU to material recycling (100%). PE film: 3,95E-03 kg/DU to recycling (40,8%), 2,78E-03 kg/DU to incineration (38,8%) and 2,22E-03 kg/DU to landfill (20,4%). Cardboard: 8,28E-02 kg/DU to recycling (93%), 3,56E-03 kg/DU to incineration (4%) and 2,67E-03 kg/DU to landfill (3%). Pallet: 3,64E-02 kg/DU to recycling (7%), 4,16E-01 to incineration (80%) and 0,00E+00 to landfill (0%).
Direct emisions to ambient air, soil and water	None

A5:2 Energy usage
As a general figure the time to install 1 m² ceiling is considered to be 20 minutes. During this time the installer is considered to use handheld appliances for about 5% of this time which in this case results in 1 minute. A handheld device such as a cordless screwdriver is considered to have a power of 0.7 kilowatt. Therefore, in one minute it will consume a total energy of 0.7*60 = 4.2 kilojoule = 0.0042 MJ, per m² ceiling. In this context it is a negligible contribution and will not be part of the LCA calculation (lower than 0.1% of the total energy consumption).

Use stage (excluding potential savings), B1-B7

Description of the stage:
The use stage is divided into 7 modules, B1 “Use”, B2 “Maintenance”, B3 “Repair”, B4 “Replacement”, B5 “Refurbishment”, B6 “Operational energy use”, B7 “Operational water use”

Description of scenarios and additional technical information:
Once installation is complete, no actions or technical operations are required during the use stages until the end of life stage. Therefore, metal ceiling panels have no impact (excluding potential energy savings) on this stage.

End-of-life stage C1-C4

Description of the stage:
The end-of life stage is divided into 4 modules; C1 “De-construction, demolition”, C2 “Transport to waste processing”, C3 “Waste processing for reuse, recovery and/or recycling”, C4 “Disposal”. Description of scenarios and additional technical information:

C1, De-construction, demolition
The dismantling of product takes part during renovation or demolition of the building. In this case, the environmental impact is assumed to be very small and can be neglected.

C2, Transport to waste processing
The model for transportation (see A4, Transportation to the building site) is applied.

C3, Waste processing for reuse, recovery and/or recycling

C4, Disposal
The product is considered to be recycled (85%) with the remaining part going to landfill (15%).

Parameter	Value/description
Energy for demolition	N/A
Collection process specified by type	2,10 kg of metal ceiling with absorber (collected with mixed construction waste)
Recovery system specified by type	Material recovery 1,79 kg Energy recovery 0,00 kg
Disposal specified by type	Landfill, 0,32 kg Incineration 0,00 kg
Assumptions for scenario development (e.g. transportation)	Average truck trailer with a 24t payload, diesel consumption 31.7 litres for 100 km 80 km (distance to landfill)

Reuse/recovery/recycling potential, D

Products are assumed to be recycled after the initial lifecycle. This dicplaces use of raw materials. Equal assumptions are made when it comes to packaging materials such as plastic, cardboard and wooden pallets. Products, plastic, cardboard and wood are all recycled to different lengths which causes displacement of energy and virgin raw materials such as plastic, pulp and wood from the life cycle model.

The following table describes the steps and/or incoming outgoing taken into account:

Materials valued as outgoing of the system borders	Module of origin	Recycling process beyond system boundaries	Materials / Energy saved	Quantity [kg/DU]
Polyethylene film (mostly LDPE)	A5	Regeneration of PE granules by sorting, casing and pelletizing	PE granules	3,95E-03
Wood pallet	A5	Preparation of wood cuttings for reintegration into the manufacture of wood products (particle board types)	Shredded pallets for panels	3,64E-02
	A5	Incineration with energy recovery, electrical + thermal (23%)	Crushed pallets for energy, replacing natural gas on the energy grid	4,16E-01
Cardboard	A5	Regeneration of paper pulps by chemical means	Pulp (chemical route)	8,28E-02
	A5	Incineration with energy recovery, electrical + thermal (23%)	Crushed paper for energy replacing natural gas on the energy grid	3,56E-03
Metal ceiling	C4	Steel production, electric, low-alloyed	Pig iron production	0,00E+00
	C4	Recycled aluminum ingot (100% recycled content)	Bauxite	2,05E+00

ENVIRONMENTAL PERFORMANCE

Raw materials, energy consumption as well as transport distances are all primary data that have all been taken directly from the manufacturing plants of Saint-Gobain Ecophon in 2024. The ratio of collected primary data is compared to the secondary datasets used as described by the formula below.

Modules declared, geographical scope, share of primary data, and variation between sites (last two percentages given in GWP indicator) are stated in the following table. Primary data is calculated as:

$$1 - \frac{Secondary}{(Primary + Secondary)}$$

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 use of the results of modules A1-A3 without considering the results of module C is discouraged.

Summary of the LCA results is detailed in the tables below.

All results in the EPD are written in logarithmic base of ten. Reading example: 5.2E -03 = $5.2*10^{-3}$ = 0,0052.

Mandatory impact category indicators according to EN 15804

The EPD uses the EN 15804 reference package version ‘EN 15804 EF 3.1’.

Environmental impacts								
Parameters	Product stage	Construction process stage		End-of-life stage				Reuse, recovery, recycling
	A1–A3	A4	A5	C1	C2	C3	C4	D
Climate change - total *[kg CO2 eq.]*	2,48E+01	2,64E-01	5,19E-01	0,00E+00	1,56E-02	4,64E-03	6,31E-03	-8,95E-02
Climate change - fossil *[kg CO2 eq.]*	2,30E+01	2,45E-01	4,72E-01	0,00E+00	1,45E-02	3,84E-03	5,91E-03	-8,97E-02
Climate change - biogenic *[kg CO2 eq.]*	1,71E+00	1,66E-02	4,55E-02	0,00E+00	9,82E-04	7,94E-04	3,85E-04	0,00E+00
Climate change - land use and land use change *[kg CO2 eq.]*	5,30E-02	2,57E-03	1,13E-03	0,00E+00	1,52E-04	8,62E-06	1,18E-05	1,89E-04
Ozone depletion *[kg CFC 11 eq]*	1,17E-08	3,51E-14	3,11E-10	0,00E+00	2,07E-15	1,52E-11	7,03E-11	-5,09E-09
Acidification *[Mole of H+ eq.]*	6,89E-02	2,28E-04	1,43E-03	0,00E+00	1,38E-05	8,52E-06	3,10E-05	2,04E-04
Eutrophication, freshwater *[kg P eq.]*	1,78E-04	6,74E-07	4,67E-06	0,00E+00	3,98E-08	4,19E-08	3,49E-07	2,45E-05
Eutrophication, marine *[kg N eq.]*	2,00E-02	1,29E-04	4,35E-04	0,00E+00	7,86E-06	3,90E-06	1,17E-05	1,66E-04
Eutrophication, terrestrial *[Mole of N eq.]*	2,18E-01	1,33E-03	4,73E-03	0,00E+00	8,12E-05	4,30E-05	1,27E-04	7,23E-04
Photochemical ozone formation, human health *[kg NMVOC eq.]*	5,79E-02	2,78E-04	1,25E-03	0,00E+00	1,69E-05	1,26E-05	4,10E-05	-9,94E-05
Resource use, mineral and metals [1] [2] *[kg Sb eq.]*	1,40E-05	1,66E-08	2,86E-07	0,00E+00	9,78E-10	9,81E-10	3,81E-09	1,76E-07
Resource use, fossils [1] *[MJ]*	2,94E+02	3,18E+00	6,03E+00	0,00E+00	1,88E-01	6,88E-02	1,07E-01	-1,15E+00
Water deprivation [1] *[m3 world eq.]*	2,33E+00	1,00E-03	4,78E-02	0,00E+00	5,90E-05	6,97E-04	2,79E-03	3,72E+01

[1] 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

[2] The results of the impact category abiotic depletion of minerals and metals may be highly uncertain in LCAs that include capital goods/infrastructure in secondary datasets, in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available secondary datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.

Additional mandatory and voluntary impact category indicators

Environmental impacts								
Parameters	Product stage	Construction process stage		End-of-life stage				Reuse, recovery, recycling
	A1–A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG *[kg CO2 eq.]*	2,57E+01	2,48E-01	-4,03E-01	0,00E+00	1,47E-02	3,85E-03	5,92E-03	-8,95E-02

GWP-GHG is calculated with the same characterisation factors as in EN 15804+A2 (EN 15804 EF 3.1).

Resource use indicators

Resource use								
Parameters	Product stage	Construction process stage		End-of-life stage				Reuse, recovery, recycling
	A1–A3	A4	A5	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials *[MJ]*	1,85E+02	2,34E-01	3,72E+00	0,00E+00	1,38E-02	3,61E-02	1,07E-02	2,32E-02
Use of renewable primary energy used as raw materials *[MJ]*	1,04E+01	0,00E+00	-1,04E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) *[MJ]*	1,96E+02	2,34E-01	-6,63E+00	0,00E+00	1,38E-02	3,61E-02	1,07E-02	2,32E-02
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material *[MJ]*	2,94E+02	3,18E+00	6,03E+00	0,00E+00	1,88E-01	6,88E-02	1,07E-01	-1,15E+00
Use of non-renewable primary energy used as raw materials *[MJ]*	3,32E-01	0,00E+00	-3,32E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) *[MJ]*	2,94E+02	3,18E+00	5,70E+00	0,00E+00	1,88E-01	6,88E-02	1,07E-01	-1,15E+00
Use of secondary material *[kg]*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels *[MJ]*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels *[MJ]*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water *[m³]*	1,11E-01	1,13E-04	2,24E-03	0,00E+00	6,66E-06	2,91E-05	6,76E-05	8,66E-01

The energy stored in packaging material leave system boundary in A5 and energy stored in the product at end-of-life in C4 and is therefore reported with a negative figure in A5 respectively C4, and zero over the life cycle. This approach is in accordance with Option A as presented in PCR 2019:14.

Waste indicators

Waste categories								
Parameters	Product stage	Construction process stage		End-of-life stage				Reuse, recovery, recycling
	A1–A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed *[kg]*	1,10E-02	1,15E-10	1,02E-03	0,00E+00	6,80E-12	1,40E-05	3,57E-05	1,02E-03
Non-hazardous waste disposed *[kg]*	6,56E+00	4,18E-04	1,35E-01	0,00E+00	2,47E-05	4,08E-05	1,97E-01	3,46E-03
Radioactive waste disposed *[kg]*	1,52E-02	4,19E-06	3,05E-04	0,00E+00	2,47E-07	8,30E-06	6,67E-07	1,81E-05

Output flow indicators

Output flows								
Parameters	Product stage	Construction process stage		End-of-life stage				Reuse, recovery, recycling
	A1–A3	A4	A5	C1	C2	C3	C4	D
Components for re-use (CRU) *[kg]*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for Recycling (MFR) *[kg]*	0,00E+00	0,00E+00	1,33E-01	0,00E+00	0,00E+00	1,88E+00	0,00E+00	0,00E+00
Materials for energy recovery (MER) *[kg]*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE) *[MJ]*	0,00E+00	0,00E+00	2,61E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (EET) *[MJ]*	0,00E+00	0,00E+00	5,49E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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

EN 15804:2012+A1

Parameters	Product stage	Construction process stage		End-of-life stage				Reuse, recovery, recycling
	A1–A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential (GWP) *[kg CO2 eq.]*	2,28E+01	2,42E-01	4,69E-01	0,00E+00	1,43E-02	0,00E+00	5,82E-03	-8,66E-02
Ozone Depletion Potential (ODP) *[kg R11 eq.]*	1,17E-08	3,51E-14	3,11E-10	0,00E+00	2,07E-15	0,00E+00	7,03E-11	-5,09E-09
Acidification potential (AP) *[kg SO_2 eq.]*	6,89E-02	2,28E-04	1,43E-03	0,00E+00	1,38E-05	0,00E+00	3,10E-05	2,04E-04
Eutrophication potential (EP) *[kg $(PO_4)^{3-}$ eq.]*	1,08E-02	5,71E-05	2,52E-04	0,00E+00	3,45E-06	0,00E+00	6,72E-06	6,78E-05
Photochemical ozone creation (POPC) *[Ethene eq.]*	5,30E-03	8,16E-07	1,11E-04	0,00E+00	-9,79E-08	0,00E+00	3,96E-06	-2,72E-05
Abiotic depletion potential for non-fossil resources (ADP-elements) *[kg Sb eq.]*	1,41E-05	1,65E-08	2,89E-07	0,00E+00	9,73E-10	0,00E+00	3,82E-09	1,77E-07
Abiotic depletion potential for fossil resources (ADP-fossil fuels) *[MJ/FU]*	2,45E+02	3,11E+00	5,05E+00	0,00E+00	1,84E-01	0,00E+00	1,04E-01	-2,20E+00

Recycling scenario 100%

Environmental impacts								
Parameters	Product stage	Construction process stage		End-of-life stage				Reuse, recovery, recycling
	A1–A3	A4	A5	C1	C2	C3	C4	D
Climate change - total *[kg CO2 eq.]*	2,48E+01	2,64E-01	5,19E-01	0,00E+00	1,56E-02	0,00E+00	4,32E-03	-4,35E-02
Climate change - fossil *[kg CO2 eq.]*	2,30E+01	2,45E-01	4,72E-01	0,00E+00	1,45E-02	0,00E+00	3,94E-03	-8,09E-02
Climate change - biogenic *[kg CO2 eq.]*	1,71E+00	1,66E-02	4,55E-02	0,00E+00	9,82E-04	0,00E+00	3,70E-04	3,72E-02
Climate change - land use and land use change *[kg CO2 eq.]*	5,30E-02	2,57E-03	1,13E-03	0,00E+00	1,52E-04	0,00E+00	1,08E-05	2,00E-04
Ozone depletion *[kg CFC 11 eq]*	1,17E-08	3,51E-14	3,11E-10	0,00E+00	2,07E-15	0,00E+00	2,50E-11	-5,09E-09
Acidification *[Mole of H+ eq.]*	6,89E-02	2,28E-04	1,43E-03	0,00E+00	1,38E-05	0,00E+00	2,06E-05	2,14E-04
Eutrophication, freshwater *[kg P eq.]*	1,78E-04	6,74E-07	4,67E-06	0,00E+00	3,98E-08	0,00E+00	1,85E-07	2,44E-05
Eutrophication, marine *[kg N eq.]*	2,00E-02	1,29E-04	4,35E-04	0,00E+00	7,86E-06	0,00E+00	6,33E-06	1,70E-04
Eutrophication, terrestrial *[Mole of N eq.]*	2,18E-01	1,33E-03	4,73E-03	0,00E+00	8,12E-05	0,00E+00	6,87E-05	7,66E-04
Photochemical ozone formation, human health *[kg NMVOC eq.]*	5,79E-02	2,78E-04	1,25E-03	0,00E+00	1,69E-05	0,00E+00	2,02E-05	-8,77E-05
Resource use, mineral and metals [1 2] *[kg Sb eq.]*	1,40E-05	1,66E-08	2,86E-07	0,00E+00	9,78E-10	0,00E+00	7,33E-10	1,80E-07
Resource use, fossils [1] *[MJ]*	2,94E+02	3,18E+00	6,03E+00	0,00E+00	1,88E-01	0,00E+00	5,92E-02	-1,00E+00
Water deprivation [1] *[m3 world eq.]*	2,33E+00	1,00E-03	4,78E-02	0,00E+00	5,90E-05	0,00E+00	6,33E-04	3,72E+01

Resource use								
Parameters	Product stage	Construction process stage		End-of-life stage				Reuse, recovery, recycling
	A1–A3	A4	A5	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials *[MJ]*	1,85E+02	2,34E-01	3,72E+00	0,00E+00	1,38E-02	0,00E+00	1,02E-02	3,29E-02
Use of renewable primary energy used as raw materials *[MJ]*	1,04E+01	0,00E+00	-1,04E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) *[MJ]*	1,96E+02	2,34E-01	-6,63E+00	0,00E+00	1,38E-02	0,00E+00	1,02E-02	3,29E-02
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material *[MJ]*	2,94E+02	3,18E+00	6,03E+00	0,00E+00	1,88E-01	0,00E+00	5,92E-02	-1,00E+00
Use of non-renewable primary energy used as raw materials *[MJ]*	3,32E-01	0,00E+00	-3,32E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) *[MJ]*	2,94E+02	3,18E+00	5,70E+00	0,00E+00	1,88E-01	0,00E+00	5,92E-02	-1,00E+00
Use of secondary material *[kg]*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels *[MJ]*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels *[MJ]*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water *[m³]*	1,11E-01	1,13E-04	2,24E-03	0,00E+00	6,66E-06	0,00E+00	1,74E-05	8,66E-01

Waste categories								
Parameters	Product stage	Construction process stage		End-of-life stage				Reuse, recovery, recycling
	A1–A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed *[kg]*	1,10E-02	1,15E-10	1,02E-03	0,00E+00	6,80E-12	0,00E+00	9,24E-12	1,14E-03
Non-hazardous waste disposed *[kg]*	6,56E+00	4,18E-04	1,35E-01	0,00E+00	2,47E-05	0,00E+00	1,97E-01	4,00E-03
Radioactive waste disposed *[kg]*	1,52E-02	4,19E-06	3,05E-04	0,00E+00	2,47E-07	0,00E+00	6,67E-07	2,00E-05

Landfill scenario 100%

Environmental impacts								
Parameters	Product stage	Construction process stage		End-of-life stage				Reuse, recovery, recycling
	A1–A3	A4	A5	C1	C2	C3	C4	D
Climate change - total *[kg CO2 eq.]*	2,48E+01	2,64E-01	5,19E-01	0,00E+00	1,56E-02	0,00E+00	1,76E-02	-1,04E-01
Climate change - fossil *[kg CO2 eq.]*	2,30E+01	2,45E-01	4,72E-01	0,00E+00	1,45E-02	0,00E+00	1,71E-02	-1,40E-01
Climate change - biogenic *[kg CO2 eq.]*	1,71E+00	1,66E-02	4,55E-02	0,00E+00	9,82E-04	0,00E+00	4,70E-04	3,62E-02
Climate change - land use and land use change *[kg CO2 eq.]*	5,30E-02	2,57E-03	1,13E-03	0,00E+00	1,52E-04	0,00E+00	1,75E-05	1,31E-04
Ozone depletion *[kg CFC 11 eq]*	1,17E-08	3,51E-14	3,11E-10	0,00E+00	2,07E-15	0,00E+00	3,26E-10	-5,09E-09
Acidification *[Mole of H+ eq.]*	6,89E-02	2,28E-04	1,43E-03	0,00E+00	1,38E-05	0,00E+00	8,95E-05	1,48E-04
Eutrophication, freshwater *[kg P eq.]*	1,78E-04	6,74E-07	4,67E-06	0,00E+00	3,98E-08	0,00E+00	1,28E-06	2,48E-05
Eutrophication, marine *[kg N eq.]*	2,00E-02	1,29E-04	4,35E-04	0,00E+00	7,86E-06	0,00E+00	4,19E-05	1,44E-04
Eutrophication, terrestrial *[Mole of N eq.]*	2,18E-01	1,33E-03	4,73E-03	0,00E+00	8,12E-05	0,00E+00	4,56E-04	4,77E-04
Photochemical ozone formation, human health *[kg NMVOC eq.]*	5,79E-02	2,78E-04	1,25E-03	0,00E+00	1,69E-05	0,00E+00	1,59E-04	-1,66E-04
Resource use, mineral and metals [1 2] *[kg Sb eq.]*	1,40E-05	1,66E-08	2,86E-07	0,00E+00	9,78E-10	0,00E+00	2,13E-08	1,54E-07
Resource use, fossils [1] *[MJ]*	2,94E+02	3,18E+00	6,03E+00	0,00E+00	1,88E-01	0,00E+00	3,81E-01	-1,97E+00
Water deprivation [1] *[m3 world eq.]*	2,33E+00	1,00E-03	4,78E-02	0,00E+00	5,90E-05	0,00E+00	1,50E-02	3,72E+01

Resource use								
Parameters	Product stage	Construction process stage		End-of-life stage				Reuse, recovery, recycling
	A1–A3	A4	A5	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials *[MJ]*	1,85E+02	2,34E-01	3,72E+00	0,00E+00	1,38E-02	0,00E+00	1,33E-02	-3,21E-02
Use of renewable primary energy used as raw materials *[MJ]*	1,04E+01	0,00E+00	-1,04E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) *[MJ]*	1,96E+02	2,34E-01	-6,63E+00	0,00E+00	1,38E-02	0,00E+00	1,33E-02	-3,21E-02
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material *[MJ]*	2,94E+02	3,18E+00	6,03E+00	0,00E+00	1,88E-01	0,00E+00	3,81E-01	-1,97E+00
Use of non-renewable primary energy used as raw materials *[MJ]*	3,32E-01	0,00E+00	-3,32E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) *[MJ]*	2,94E+02	3,18E+00	5,70E+00	0,00E+00	1,88E-01	0,00E+00	3,81E-01	-1,97E+00
Use of secondary material *[kg]*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels *[MJ]*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels *[MJ]*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water *[m³]*	1,11E-01	1,13E-04	2,24E-03	0,00E+00	6,66E-06	0,00E+00	3,53E-04	8,66E-01

Waste categories								
Parameters	Product stage	Construction process stage		End-of-life stage				Reuse, recovery, recycling
	A1–A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed *[kg]*	1,10E-02	1,15E-10	1,02E-03	0,00E+00	6,80E-12	0,00E+00	2,38E-04	3,82E-04
Non-hazardous waste disposed *[kg]*	6,56E+00	4,18E-04	1,35E-01	0,00E+00	2,47E-05	0,00E+00	1,97E-01	3,66E-04
Radioactive waste disposed *[kg]*	1,52E-02	4,19E-06	3,05E-04	0,00E+00	2,47E-07	0,00E+00	6,67E-07	7,38E-06

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
GWP	Global warming potential
GHG	Greenhouse gas
DU	Declared unit
EPD	Environmental product declaration
LCA	Life cycle assessment
CO2-eq.	Carbon dioxide equivalent

REFERENCES

ISO 354:2003 Acoustics - Measurement of sound absorption in a reverberation room

Reach: EU REACH Regulation (EC) No 1907/2006

LCA report: LCA Project report Gabelex 2025-09-08

ISO 21930:2017 - Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services

ISO 14040:2006 - Environmental management — Life cycle assessment — Principles and framework

ISO 14044:2006 - Environmental management — Life cycle assessment — Requirements and guidelines

ISO 14025:2006 - Environmental labels and declarations — Type III environmental declarations — Principles and procedures

SS-EN 15804:2012+A2:2019/AC:2021 - Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

The study is based on the following PCR and guidelines:

- EPD International. General Program Instructions (GPI: 2025 - version 5.0.1)
- Product Category Rules for construction products and construction services (PCR 2019:14 – version 2.0.1)
- N.B. Not consistent with following standard but LCA is performed in accordance with following rules as much as possible: Associated c-PCR-014 “Acoustical ceiling and wall solutions” (2024-04-30) administered by The International EPD® System

VERSION HISTORY

Original Version of the EPD, 2025-09-09

Revision 1, 20YY-MM-DD,
Differences versus the previously published version:

Revision 2, 20YY-MM-DD
Differences versus the previously published version: