ENVIRONMENTAL PRODUCT DECLARATION

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

DURAflex/DURAwood Low Carbon fiber cement board 12mm

Programme
The International EPD® System,
www.environdec.com
EPD registered through the fully aligned regional hub EPD Southeast Asia,
http://www.epd-southeastasia.com/

Programme operator
EPD international AB

Regional Hub
EPD Southeast Asia

Validity
5 years

EPD registration number
EPD-IES-0026612:001

Version date
2025-10-31

Version
1

Validity date
2030-10-31

Scope of the EPD
Global

EPD Owner:
Saint-Gobain Vietnam Limited

An EPD may be updated or depublished if conditions change. To be find the lates version of the EPD and to confirm its validity, see www.environdec.com

General information

Programme information

PROGRAMME:	**The International EPD® System** EPD registered through the fully aligned regional hub: EPD Southeast Asia	
ADDRESS:	**EPD International AB** Box 210 60, SE-100 31 Stockholm, Sweden **EPD Southeast Asia** Kencana Tower Level M, Business Park Kebon Jeruk Jl. Raya Meruya Ilir No.89, Jakarta Barat 11620, Indonesia	**WEBSITE:** www.environdec.com www.epd-southeastasia.com **E-MAIL:** info@environdec.com

PCR information

CEN standard EN 15804:2012+A2:2019/AC:2021 as the Core Product Category Rules (PCR)

Product category rules (PCR): PCR 2019:14 Construction Products, version 2.0.1

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).

Verification

External and independent ('third-party') verification of the declaration and data, according to ISO 14025:2006, via
EPD verification through:
☒ Individual EPD verification without a pre-verified LCA/EPD tool
☐ Individual EPD verification with a pre-verified LCA/EPD tool
☐ EPD process certification* without a pre-verified LCA/EPD tool
☐ EPD process certification* with a pre-verified LCA/EPD tool
☐ Fully pre-verified EPD tool

Independent third-party verification of the declaration and data, according to ISO 14025:2006:
☒ EPD verification by individual verifier
Third party verifier: Dandan.Li
Star Talers EnviroTech Ltd - dandan.li@startalers.cn
Approved by: The International EPD© System

Procedure for follow-up of data during EPD validity involves third part verifier: ☒ Yes ☐ No

Ownership and limitations on use of EPD

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 characterization factors); and be valid at the time of comparison.

Contact information

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Information about EPD owner

Address and contact information of the EPD owner: Saint-Gobain Vietnam Limited - 8th Floor, Sofic Building, 10 Mai Chi Tho, Thu Thiem Ward, Thu Duc City, Ho Chi Minh City.
Description of the organization of the EPD owner: Saint-Gobain Vietnam designs, manufactures, and distributes groups of materials and solutions, which are key elements in building comfortable and friendly living spaces for each person and for the future of all of us. We believe that materials make up life. To fuel that belief, we set ourselves the goal of MAKING THE WORLD A BETTER HOME with the vision of becoming the world's leading provider of lightweight and sustainable building materials solutions. Saint-Gobain has 3 fundamental factors to confidently complete that goal. These are: Continuously investing in expanding solutions. Synchronizing quality according to global standards and a creative spirit.
Management system-related certification: ISO 9001, ISO 14001, ISO 45001, Green Label
LCA practitioner: Zhao Lin (lin.zhao@saint-gobain.com), Giang Bui Thanh (giang.buithanh@saint-gobain.com), Trang Huynh Thi Thuy (trang.huynhthithuy2@saint-gobain.com), Quy Nguyen Thi Bich (quy.nguyenthibich@saint-gobain.com)
Communication: The intended use of this EPD is for B2B communication.

Product information

Product name: Duraflex/Durawood Low Carbon fiber cement board 12mm
Visual representation of the product:

UN CPC CODE: 37570 Articles of asbestos-cement, cellulose fibre-cement or the like
Manufacturing site(s):
- **Hiep Phu Corporation** - Lot G.02B, Street No.1, Long Hau Industrial Park, Long Hau commune, Can Giuoc district, Long An province, Vietnam
- **Hiep Phu – Vico Joint Stock Company** - Tra Tri Hamlet, Hai Hung Commune, Hai Lang District, Quang Tri Province, Viet Nam.

Product description

Reference product description: DURAflex and DURAwood Low Carbon fiber cement board are green material, 100% non-asbestos, made out of cement, lime, sand, pulp and additives. DURAflex and DURAwood Low Carbon fiber cement board are formed with high pressure and accelerated cure to establish unique characteristics such as superior durability, rigidity and moisture resistance.

For more information: https://duraflex.com.vn/vi

Technical data/physical characteristics:

Parameter	Value / Description
EN Classification	TCVN 8258 & ASTM C1186
Reaction to fire	Non-combustible
Water vapour resistance factor, μ	None
Thermal conductivity	0.185 (W/m.K)

Application	Value / Description
Intended use and key functionalities	Ceiling, drywall & floor
Expected influence on the operational aspects and impact of the building or other construction work	None
Restrictions to a type of construction or building	None
Lifespan	50 years

Content declaration

Description of the main components and/or materials:

Quantity for 1 declared unit 19 kg of finished product

Product components	Mass (kg)	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Cement	2.6 – 4.7	0%	0%	0
Sand	5.2 – 10.2	0%	0%	0
Pulp	0.6 – 1.0	1%	6%	0.5
Additive	0.0006 – 0.9	0%	0%	0
Sum	**19.00**	**1%**	**6%**	**0.5**

Packaging materials	Mass (kg)	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Polyethylene film (LDPE)	0.0005 – 0.0015	0.0004%	0
Wooden pallet	0.01 – 0.02	0.07%	0.00615
Cardboard	0.0001 – 0.0002	0.001%	0.0000645

Hazardous substances

At the date of issue of this declaration, there is no “Substance of Very High Concern” (SVHC) in concentration above 0.1% by weight, and neither do their packaging, following the European REACH regulation (Registration, Evaluation, Authorization and Restriction of Chemicals).

LCA information

TYPE OF EPD	Cradle to gate with options, modules C1–C4, module D and with optional modules (A1–A3 + C + D and A4-A5, B1-B7)
DECLARED UNIT	1 m² of installed board
CONVERSION FACTOR TO MASS	Density = 19 kg/m² Thickness = 12 mm
SYSTEM BOUNDARIES	Cradle to gate with options, modules C1–C4, module D and with optional modules (A1–A3 + C + D and A4-A5, B1-B7)
REFERENCE SERVICE LIFE (RSL)	The Reference Service Life (RSL) of the fiber cement board product is 50 years. This 50-year value is the amount of time that we recommend our products last for without refurbishment and corresponds to standard building design life.
CUT-OFF RULES	In the case that there is not enough information, the process energy and materials representing less than 1% of the whole energy and mass used can be excluded (if they do not cause significant impacts). The addition of all the inputs and outputs excluded cannot be bigger than the 5% of the whole mass and energy used, as well of the emissions to environment occurred. Flows related to human activities such as employee transport are excluded. 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 has been avoided when possible and when not possible a mass allocation has been applied. The polluter pays and the modularity principles as well have been followed. **Allocation of materials for recycling:** - Post-consumer: When a flow enters the manufacturing process (A1-A3), it is treated with waste allocation (as defined in EN15804+A2). All the steps after its “End of Waste” status are quantified. The incoming flow contributes to module D and Secondary Materials indicator. - Pre-consumer: When a flow enters the manufacturing process (A1-A3), it is considered as an incoming coproduct that bears a fraction of the impact of the original manufacturing process where it was generated (which might be 0, e.g. in case of an economic allocation with a negligible (<1%) economic value). The incoming flow does not contribute to module D nor Secondary Materials indicator.
DATA QUALITY ASSESSMENT	Data quality of primary and secondary data had been judged by its precision (measured, calculated, or estimated), completeness (e.g., unreported emissions), consistency (degree of uniformity of the methodology applied), and representativeness (geographical, technological, and temporal).
GEOGRAPHICAL COVERAGE AND TIME PERIOD	Scope: Global Data is collected from 2 production sites Hiep Phu Corporation & Hiep Phu – Vico Joint Stock Company located in Vietnam Data collected for the year 2024-6-30 to 2025-6-30
BACKGROUND DATA SOURCE	Databases from Sphera CUP2024.2 and ecoinvent v.3.10 EF Package 3.1
SOFTWARE	Sphera LCA for experts 10

Data quality declaration

Data Quality Assessment: All process-specific data was collected for the 2024-6-30 to 2025-6-30 and is therefore up to date. Manufacturing-related data is based on factory averages, and mass allocation factors have been applied. Dataset selection considered geographic relevance, prioritizing regional and country-specific data where available to best reflect actual operational locations. From a technical perspective, when specific data was not available, the most representative proxy datasets were used, selected based on technological equivalence and process similarity. The overall data quality is good.

Data quality information according to EN 15941	
Data collection	30/6/2024-30/6/2025
Sites used	2 sites in Long An province and Quang Tri province in Vietnam owned by the Saint-Gobain Vietnam Ltd **- Hiep Phu Corporation** - Lot G.02B, Street No.1, Long Hau Industrial Park, Long Hau commune, Can Giuoc district, Long An province, Vietnam **- Hiep Phu – Vico Joint Stock Company** - Tra Tri Hamlet, Hai Hung Commune, Hai Lang District, Quang Tri Province, Viet Nam
Geography	The product is manufactured at 2 sites in Vietnam, representing 100% of the Saint-Gobain Vietnam Ltd's production volume for this product in Vietnam. These sites are representative of the company's production and distribution practices. The product is sold globally and the EPD is modelled for global use and disposal.
Technology	Fiber cement boards are manufactured using an automated winding process followed by autoclaved curing based on fiber cement technology
Averaging	Production weighted average covering 100% of production by the Saint-Gobain Vietnam Ltd
LCI/LCA database	Sphera CUP2024.2 and ecoinvent v.3.10
EPD used	None
Data Quality Scheme	EN 15804 :2012+A2:2019, Annex E, Table E.2
Use of fair data with more than 30% of a core impact	None
Use of Poor relevant data	Data for fly ash is geographically poor as it covers a different region. However, no other specific data was available. It has 2.0% of the GWP impact and 0.1% to 2.4% of the other core impact.
Use of very poor relevant data	No very poor data used

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.

Process	Source type	Source	Reference year	Data category	A1-A3 GWP-GHG [kg CO_2 eq.]
Manufacturing process					
Thermal energy	Database	Sphera 2024.2	<5 years old	Primary data	5.9%
Electricity	Database	Sphera 2024.2 /ecoinvent 3.10	<5 years old	Primary data	13.4%
Transportation (only if specific data collected)					
Transport of RM Product	Database	Sphera 2024.2 /ecoinvent 3.10	<5 years old	Primary data	2%
Transport of RM Packaging	Database	Sphera 2024.2 /ecoinvent 3.10	<5 years old	Primary data	0%
Background datasets in A1-A3					
Other processes	Database	Sphera 2024.2 /ecoinvent 3.10	<5 years old	Secondary data	0%
				Total share of primary data	**21%**

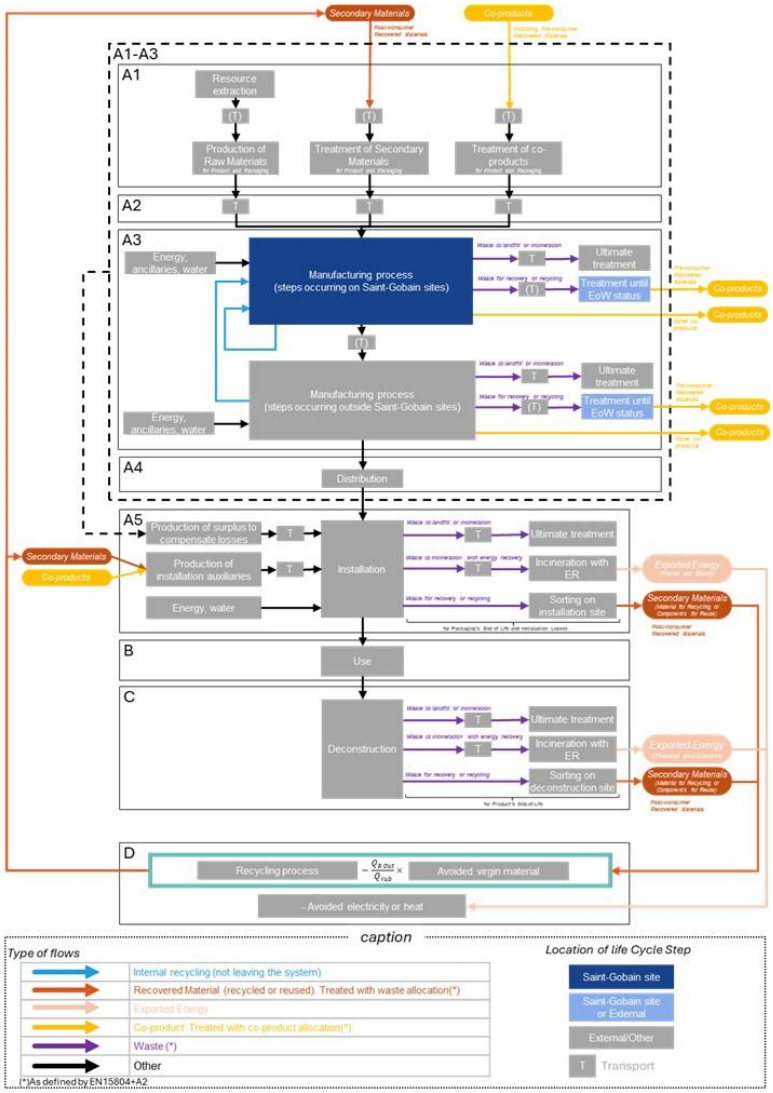
A1-A3 GWP-GHG	7.81E+00

Description of system boundaries

System boundaries (X=included. MND=module not declared)

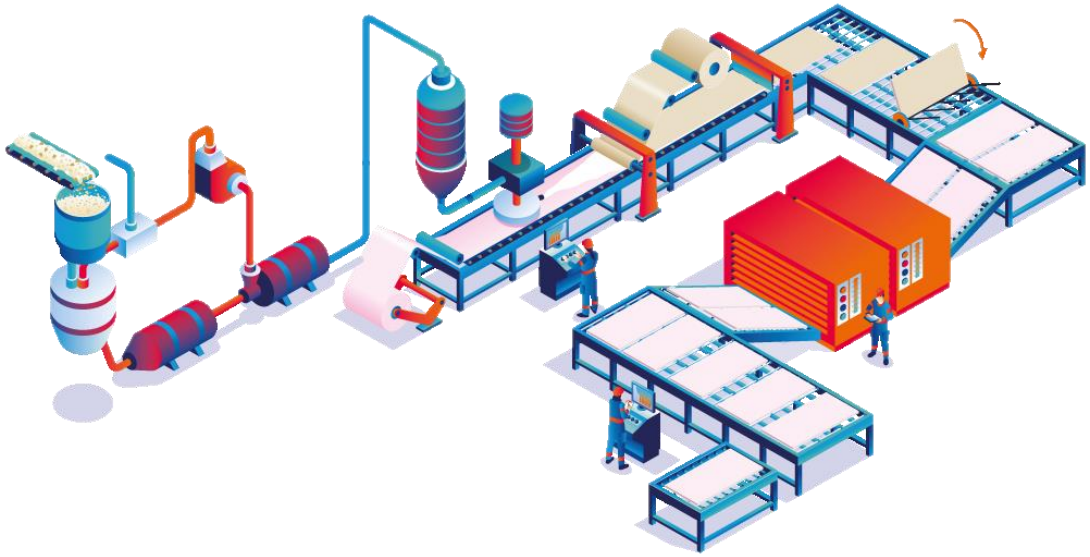
	PRODUCT STAGE			CONSTRUCTION STAGE		USE STAGE						END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
	Raw material supply	Transport	Manufacturing	Transport	Construction-Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-recovery
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	GLO	GLO	VN	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO

System boundaries when the end-of-waste state is reached:



Life cycle stages

A1-A3. Product stage



The product stage of fiber cement board products is subdivided into 3 modules A1, A2 and A3 respectively “raw material supply”, “transport to manufacturer” and “manufacturing”.

A1. Raw materials supply
This module includes the extraction and transformation of raw materials.

A2. Transport to the manufacturer
This module includes the transportation of raw materials and packaging to the manufacturing site. The modelling includes road, boat and/or train transportations.

A3. Manufacturing
This module includes the manufacture of products and the manufacture of packaging. The production of packaging material is considered at this stage. The processing of any waste arising from this stage is also included.
A portion of the gypsum scraps generated during production is classified as pre-consumer recycled material. Some of these scraps are internally recycled and collected on-site, crushed and ground to the required particle size, then mixed with cement and other additives to form a homogeneous slurry used in fiber cement board production. The remaining scraps are sent for external recycling.

Manufacturing process description

This module includes:

- the extraction and processing of all raw materials (Silica sand, Cement…) and packaging which occur upstream to the studied manufacturing process,
- the transportation of raw materials and packaging to the manufacturing site,
- the manufacturing of products (energy consumption, water consumption, waste management…).

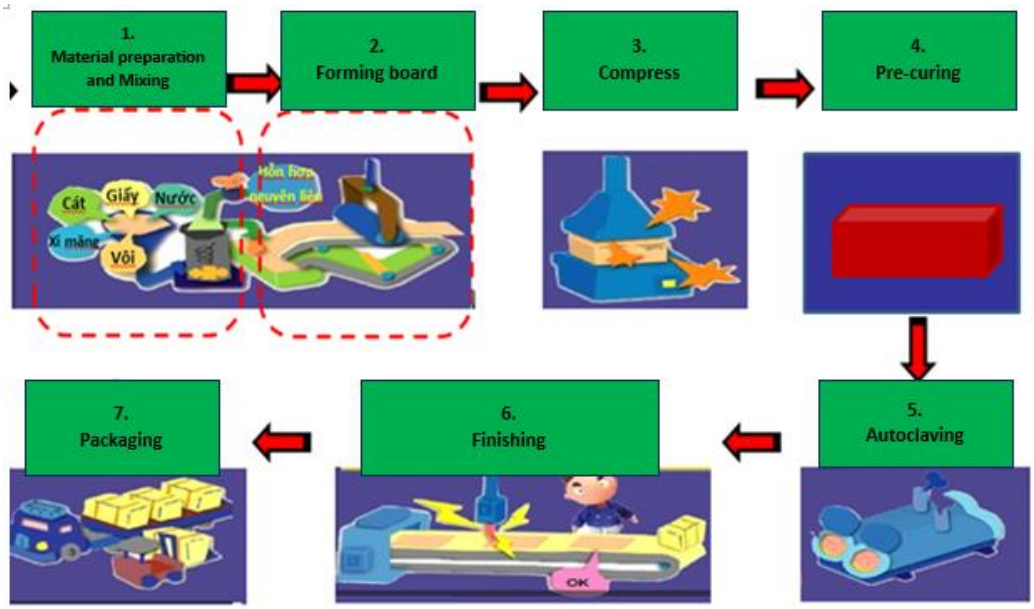


Figure 1. Manufacturing process of fiber cement board.

1. **Material preparation and Mixing**:

   Material preparation:

   Cement: Cement is stored in Silo and will be weighed on the scale when prepare mixing

   Pulp: Pulp is diluted in water and refining; the pulp mortar is pumped into the storage tank and will be weighed on the scale when prepare mixing.

   Silica sand: Input Silica sand is grinded to sand mortar. The sand mortar is pumped into the storage tank and will be weighed on the scale when prepare mixing.

   Additives: Additives are stored and will be weighed on the scale when prepare mixing.

   Mixing: The material after quantity according to the norm of the mixing recipe are pumped into mixing tank in order is Water, Silica sand mortar, Pulp mortar, Cement, Additives. After mixing, the mixture is collected into the storage tank to prepare for forming board.

2. ***Forming board:*** The mixture overflows onto the forming felt – the flow on technology - to help the Cellulose fibers distribute properly, forming an interwoven matrix to bond with other fine materials such as sand, cement, additives and then will be wrapped layer by layer on rolling roller to forming the board follow thickness required by pressed from a rubber roller with forming roller.

   The semi-finished boards are cut by high pressure water jets cutting system to reach the standard size and will stack 1 Semi- finish board with 1 steel plate and put onto the car to the Compress machine.

3. **Compress**: The semi-finished boards on the stack are compressed to help the surface of board flat and smoother in both side

4. **Pre-Curing:** The semi-finished boards before going to the Autoclaving will be taken to the Pre-curing chamber by warm air.

5. **Autoclaving:** After Pre-Curing, semi-finished boards go to De-stacker system to de-stack the semi-finished boards and steel plate. After that, the semi-finished boards are stacked on Autoclave car. The boards on Autoclave car entering the Autoclave that are autoclaved with temperatures to create stable, hard minerals (Tobermorite, Xonotlite, Wollastonite…)

6. **Finishing and packaging**: The Finished good boards are de-stacked from Autoclave car.

Packaging: The board are stacked on pallet for the storage in the warehouse and ready for delivery to customer.

A4-A5. Construction process stage

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 / Description
Fuel type and consumption of vehicle or vehicle type used for transport e.g., long-distance truck, boat, etc.	Freight truck, maximum load weight of 30 t, real load is 27 t and consumption of 0.38 liters per km
Distance	161 km by truck 241 km by ship
Capacity utilization (including empty returns)	69% (30% empty returns)
Bulk density of transported products*	1450 kg/m^3
Volume capacity utilization factor	1 (by default)

A5. Installation in the building

This module includes: the installation of the product, the surplus of raw materials and packaging (cradle to gate) to compensate for the loss of product during the installation, the transport and management of packaging and product waste.

Parameter	Value / Description
Ancillary materials for installation (specified by materials)	Manual installation. Jointing compound: 0 kg/m^2 Jointing tape: 0 m/ m^2 board (0 kg/ m^2) Screws: 0 units/ m^2 board (0 kg/ m^2)
Water for on-site mixing of jointing compound	0 liters/m^2
Other resource use	None
Electricity for on-site mixing of jointing compound	0 MJ/m^2
Scrap rate at installation	3% for plasterboard and for ancillary materials 100% for packaging
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	Fiber cement board: 0.57 kg/m^2 Jointing Compound: 0 kg/m^2 Jointing Tape: 0 kg/m^2 Packaging: 0 kg/m^2
Transport of packaging waste	Landfill: 10 km Recycling: 10 km
Output materials (specified by type) as results of waste processing at the building site e.g., of collection for recycling, for energy recovering, disposal (specified by route)	Product losses: 100% landfill Wooden pallet: 100% recycling LDPE film: 60% to landfill, 40% to recycling Cardboard: 60% to landfill, 40% to recycling
Direct emissions to ambient air, soil, and water	None

B1-B7. Use stage (excluding potential savings)

The use stage is divided into the following modules:

- **B1:** Use
- **B2:** Maintenance
- **B3:** Repair
- **B4:** Replacement
- **B5:** Refurbishment
- **B6:** Operational energy use
- **B7:** Operational water use

The product has a reference service life of 50 years. This assumes that the product will last in situ with no requirements for maintenance, repair, replacement, or refurbishment throughout this period. Therefore, it has no impact at this stage.

C1-C4. End of Life Stage

This stage includes the next modules:

- **C1: Deconstruction, demolition.** The de-construction and/or dismantling of the product take part of the demolition of entire building. The energy considered for demolition is 0.018 MJ/kg of product.
- **C2: Transport to waste processing**
- **C3: Waste processing for reuse, recovery and/or recycling**
- **C4: Waste disposal**, including physical pre-treatment and site management.

Description of the scenarios and additional technical information for the end of life:

Parameter	Value / Description
Collection process specified by type	19 kg of fiber cement board including paper liner is collected with mixed deconstruction and demolition waste.
Recovery system specified by type	0 kg recycled
Disposal specified by type	19 kg to landfill
Assumptions for scenario development (e.g. transportation)	The waste will be transported by truck with 24 t payload, using diesel as a fuel consuming 38 liters per 100 km Transport distance to landfill: 10 km Transport distance to recycling: 10 km

D. Reuse/recovery/recycling potential

In the module D is declared the environmental benefits and loads from reusable products, recyclable materials, or energy recovery. Module D considers:

- Inputs of secondary materials: recycled raw materials for product and packaging (pre- and post-consumer),
- Outputs of secondary materials: product and/or packaging sent to recycling,
- Exported energy (electric or thermal): product and/or packaging sent to incineration with energy recovery.

Environmental performance

As specified in EN 15804:2012+A2:2019/AC:2021 and the Product-Category Rules, the environmental impacts are declared and reported using the baseline characterization factors based on EF 3.1. Raw materials and energy consumption, as well as transport distances have been taken directly from the manufacturing plant.

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins 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).

Disclaimer 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 experienced with the following indicators:

- Resource use, mineral and metals [kg Sb eq.]
- Resource use, energy carriers [MJ]
- Water deprivation potential [m^3 world equiv.]
- Land use [Pt]
- Human toxicity (cancer) [CTUh]
- Human toxicity(noncancer) [CTUh]
- Ecotoxicity (freshwater [CTUe]

Disclaimer 2: The impact category Ionizing radiation, human health [kBq U235 eq.] 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 material is also not measured by this indicator.

Disclaimer 3: The assumptions for the modules are in accordance with the project report (LCA study).

The following non-mandatory additional environmental indicators are not declared:

- Ecotoxicity freshwater [CTUe]
- Particulate Matter emissions [Disease incidence]
- Cancer human health effects [CTUh]
- Ionizing radiation - human health [kBq U235 eq.]
- Non-cancer human health effects [CTUh]
- Land Use [Pt].

Results refer to a declared unit of 1m^2 of installed fiber cement board 12 mm with a weight of 19 kg/m^2. The following results refer to a single product manufactured in two plants.

Environmental Impacts

Environmental indicators	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
Climate Change [kg CO2 eq.]	5.89E+00	2.37E-01	2.65E-01	0	0	0	0	0	0	0	3.04E-02	1.32E-02	0	1.86E+00	2.81E-05
Climate Change (fossil) [kg CO2 eq.]	7.45E+00	2.33E-01	2.38E-01	0	0	0	0	0	0	0	3.04E-02	1.30E-02	0	2.15E-01	2.87E-05
Climate Change (biogenic) [kg CO2 eq.]	-1.56E+00	5.35E-04	2.58E-02	0	0	0	0	0	0	0	2.45E-06	3.58E-05	0	1.64E+00	-2.81E-06
Climate Change (land use change) [kg CO2 eq.]	5.86E-03	2.96E-03	2.17E-04	0	0	0	0	0	0	0	2.64E-06	2.15E-04	0	1.11E-03	-4.49E-07
Ozone depletion [kg CFC-11 eq.]	1.35E-08	2.19E-14	4.31E-10	0	0	0	0	0	0	0	4.65E-10	1.29E-15	0	9.11E-10	-9.98E-13
Acidification terrestrial and freshwater [Mole of H+ eq.]	2.06E-02	2.02E-03	6.63E-04	0	0	0	0	0	0	0	2.74E-04	1.46E-05	0	1.52E-03	2.36E-07
Eutrophication freshwater [kg P eq.]	1.03E-04	7.65E-07	3.14E-06	0	0	0	0	0	0	0	1.07E-07	5.46E-08	0	1.28E-06	-1.63E-09
Eutrophication marine [kg N eq.]	6.13E-03	4.94E-04	1.97E-04	0	0	0	0	0	0	0	1.27E-04	4.85E-06	0	4.19E-04	-3.76E-09
Eutrophication terrestrial [Mole of N eq.]	5.80E-02	5.50E-03	1.88E-03	0	0	0	0	0	0	0	1.39E-03	5.91E-05	0	4.61E-03	6.00E-07
Photochemical ozone formation - human health [kg NMVOC eq.]	1.60E-02	1.41E-03	5.21E-04	0	0	0	0	0	0	0	4.15E-04	1.36E-05	0	1.35E-03	2.49E-07
Resource use, mineral and metals [kg Sb eq.][1]	4.27E-06	1.62E-08	1.30E-07	0	0	0	0	0	0	0	1.08E-08	1.09E-09	0	8.99E-08	-1.24E-11
Resource use, energy carriers [MJ][1]	6.20E+01	2.94E+00	1.96E+00	0	0	0	0	0	0	0	3.94E-01	1.67E-01	0	3.11E+00	6.75E-04
Water deprivation potential [m³ world equiv.][1]	9.89E-01	2.72E-03	3.16E-02	0	0	0	0	0	0	0	1.22E-03	1.90E-04	0	6.42E-02	-2.30E-05

[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 experienced with the indicator

Resource Use

	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
Resources Use indicators	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
Use of renewable primary energy (PERE) [MJ][2]	8.74E+00	1.97E-01	4.78E-01	0	0	0	0	0	0	0	2.44E-03	1.41E-02	0	4.29E-01	5.90E-03
Primary energy resources used as raw materials (PERM) [MJ] [2]	2.23E-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources (PERT) [MJ] [2]	8.97E+00	1.97E-01	2.51E-01	0	0	0	0	0	0	0	2.44E-03	1.41E-02	0	4.29E-01	5.90E-03
Use of non-renewable primary energy (PENRE) [MJ] [2]	6.20E+01	2.94E+00	1.96E+00	0	0	0	0	0	0	0	3.94E-01	1.67E-01	0	3.11E+00	1.35E-03
Non-renewable primary energy resources used as raw materials (PENRM) [MJ] [2]	2.39E-02	0	-1.05E-03	0	0	0	0	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources (PENRT) [MJ] [2]	6.20E+01	2.94E+00	1.95E+00	0	0	0	0	0	0	0	3.94E-01	1.67E-01	0	3.11E+00	1.35E-03
Use of secondary material (SM) [kg]	1.08E+00	0	3.74E-06	0	0	0	0	0	0	0	0	0	0	0	0
Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of net fresh water (FW) [m3]	2.46E-02	2.22E-04	7.88E-04	0	0	0	0	0	0	0	2.84E-05	1.58E-05	0	1.65E-03	-8.04E-07

[2] From EPD International Construction Product PCR 2.0 (Annex 3). The option B was reatined to calculate the primary energy use indicators.

Waste Category & Output flows

	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
Waste Category & Output Flows	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
Hazardous waste disposed (HWD) [kg]	7.07E-02	9.43E-11	1.43E-01	0	0	0	0	0	0	0	3.44E-04	5.40E-12	0	4.69E+00	-2.81E-07
Non-hazardous waste disposed (NHWD) [kg]	2.64E+00	4.19E-04	6.25E-01	0	0	0	0	0	0	0	2.65E-03	2.60E-05	0	1.82E+01	9.94E-06
Radioactive waste disposed (RWD) [kg]	6.72E-04	3.71E-06	2.09E-05	0	0	0	0	0	0	0	4.37E-08	2.16E-07	0	2.54E-05	2.27E-07
Components for re-use (CRU) [kg]	0	0	1.35E-02	0	0	0	0	0	0	0	0	0	0	0	0
Materials for Recycling (MFR) [kg]	1.03E-02	0	2.03E-03	0	0	0	0	0	0	0	0	0	0	0	0
Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported thermal energy (EET) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Additional voluntary indicators from EN 15804

Environmental indicators	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				REUSE, RECOVERY RECYCLING
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
GWP-GHG [kg CO2 eq.][3]	7.81E+00	2.37E-01	2.41E-01	0	0	0	0	0	0	0	3.04E-02	1.32E-02	0	2.17E-01	5.08E-05

Information on biogenic carbon content

Biogenic Carbon Content	PRODUCT STAGE
	A1 / A2 / A3
Biogenic carbon content in product [kg]	4.51E-01
Biogenic carbon content in packaging [kg]	6.07E-03

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

The product contains biogenic carbon due to the pulp used. Regarding packaging, biogenic carbon is quantified due to wooden pallets and cardboard.

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

Declaration of variation

Variation between sites

This EPD covers one single product manufactured at different sites. The variation in the GWP-GHG indicator between sites is 1.21%.

Additional environmental information:

Electricity information

The factory based in Vietnam uses the following electricity description.

Parameter	Information
Location	Representative of residual in Vietnam
Geographical & technical representativeness	Share of energy sources: Coal 78.97% Oil 0.127% Natural gas 21.9% 2% transmission losses
Dataset version	Sphera CUP2024.2 ecoinvent 3.10 (medium voltage)
Source of electricity mix	Based on IEA data
GWP-GHG CO_2 eq.	0.958 kg of CO_2 eq/kWh

Abbreviations

AIB	Association of issuing bodies
DU	Declared unit
EPD	Environmental Product Declaration
eq.	equivalents
FU	Functional unit
g	gram
GJ	Giga Joules (as Net Calorific Value)
GWP-GHG	Global Warming Potential - Greenhouse gas
IOBC	Instantaneous Oxidation of Biogenic Carbon
EF	Environmental Footprint
GO's	Guaranty of origin
kg	kilogram
kWh	kilowatt-hour
L	liter
LCA	Life Cycle Assessment
LCI	Life Cycle Inventory Analysis
LCIA	Life Cycle Impact Assessment
MJ	Mega Joules (as Net Calorific Value)
PCR	Product Category Rules
RSL	Reference Service Life (in years)
ton	metric ton

References

1. ISO 14040:2006 Environmental Management-Life Cycle Assessment-Principles and framework.
2. ISO 14044:2006 Environmental Management-Life Cycle Assessment-Requirements and guidelines.
3. EN 15804:2012+A1:2013 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
4. EN 15804:2012+A2:2019/AC:2021 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
5. EPD International. General Program Instructions (GPI) for the International EPD® System (version 5.0.1) www.environdec.com.
6. The International EPD System PCR 2019:14 Construction products and Construction services. Version 2.0.1
7. EN 15941 Sustainability of construction works - Data quality for environmental assessment of products and construction work - Selection and use of data
8. European Chemical Agency, Candidate List of substances of very high concern for Authorization. https://echa.europa.eu/candidate-list-table
9. LCA report: 2025 LCA report_FC_6-12mm

Version history

Original version of the EPD, 2025-10-31