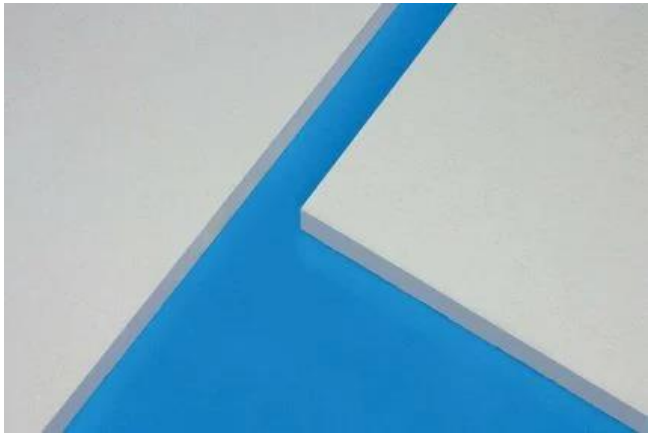


ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Medium density calcium silicate fire protective boards PROMATECT®-L, PROMATECT®-L500, PROMATECT®-AD, VERMICULUX®-S

Etex building performance N.V.



EPD HUB, HUB-7890

Published on 23.10.2026, last updated on 23.10.2026, valid until 22.10.2031

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Etex Building Performance N.V.
Address	Bormstraat 24, 2830 Tisselt, Belgium
Contact details	info@etexgroup.com
Website	https://www.promat.com

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-B7, and modules C1-C4, D
EPD author	Els De Mulder, PRTC N.V., Etex Group
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Magaly Gonzalez Vazquez as an authorized verifier for EPD Hub

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	Medium density calcium silicates fire protective boards
Additional labels	PROMATECT®-L500, PROMATECT®-L, PROMATECT®-AD, VERMICULUX®-S
Place(s) of raw material origin	Belgium (> 80 %), Europe, World.
Place of production	Tisselt, Belgium
Place(s) of installation and use	Europe, World
Period for data	Calendar year 2024
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	-1% to +0 %
A1-A3 Specific data (%)	61,4

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m² PROMATECT-L500 with a thickness of 30 mm
Declared unit mass	15 kg
Mass of packaging	0,57 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	17,4
GWP-total, A1-A3 ($kgCO_2e$)	16,1
Secondary material, inputs (%)	3,68
Total energy use, A1-A3 (kWh)	63,7
Net freshwater use, A1-A3 (m^3)	0,28

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

The manufacturer is a producer of various fire protective calcium silicate boards being non-combustible matrix engineered mineral boards reinforced with selected fibres and fillers.
The manufacturer has an environment, health and safety management system which is ISO 14001 and ISO 45001 certified. The quality management system of the company and the production facility are certified according to ISO 9001.
The manufacturer is part of the global Etex Group of Companies, which operates across Europe, Africa, Near & Middle East, and South America. The Etex group operates more than 160 sites in 45 countries and employs over 13 500 people worldwide.

PRODUCT DESCRIPTION

The medium calcium silicates fire protectives boards PROMATECT®-L, PROMATECT®-L500, PROMATECT®-AD, VERMICULUX®-S are composed of a calcium silicate matrix, cement and mineral fillers. The boards is off-white in colour and non combustible. They are produced with quality assurance according to the standard ISO 9001.

They are primarily used in interior building applications where normal to high levels of fire resistance are required. The boards are intended to protect elements or to be used in technical services assemblies. Main application areas are the fire protection of ducts such as cable, ventilation and smoke extraction ducts, fire protection to structural steel and fire protection of mechanical and electrical service enclosures. The product has an estimated reference service life of 60 years, providing the product is installed as per Etex recommendations.

Further information can be found at https://www.promat.com.

The products have a declaration of performance taking into consideration

- ETA 07/0296_2018-03-25 for PROMATECT® L
- ETA 06/0218_2018-06-25 for PROMATECT® L500
- ETA 08/0130_2018-06-25 for PROMATECT® AD
- ETA 19/0434_2020-03-01 for VERMICULUX-S

Within Etex, there is the commitment to reduce the use of virgin and non-renewable materials by optimizing our current processes related to waste management and developing responsible sourcing, through innovation and partnerships. Based on the traced and proofed flows of raw materials, the PROMATECT®-L500 contains 19.6 % circular content:

- 2.5 % pre-consumer recycled content
- 15.6 % other waste-derived material content*
- 1,5 % renewable material content

*Other waste material: By-products from virgin material productions and/or Internal production waste.
Further information can be found in the Recycled Content & Circular Content Declaration for PROMATECT®-L500 available upon request.

This EPD is representative for all PROMATECT®-L 500, PROMATECT®-L PROMATECT®-AD and VERMICULUX®-S produced by Etex in Belgium and presents the environmental impacts for the production of 1m^2 of PROMATECT®-L 500 with a thickness of 30 mm, a reference service life of 60 years and its related impacts over the cradle to grave life-cycle modules.

The environmental impacts of the product with another thickness can be considered as proportional to the thickness of the product. Accordingly, for any actual board thickness, the environmental impacts for the actual board thickness can be easily obtained by multiplying the results in this EPD by the ratio (actual thickness (mm) / 30 mm).

LCA calculations were performed for each of the covered products and the results were compared to the results of the representative product. The variation analysis confirmed that the maximal variation was very low and below the allowable limit for the GWP-fossil in modules A1-A3 (-1% to +0%).

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	/	/
Minerals	98,4	Europe, World
Fossil materials	0,2	Europe
Bio-based materials	1,4	Europe, World

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0,09
Biogenic carbon content in packaging, kg C	0,25

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 m² PROMATECT-L500 with a thickness of 30 mm
Mass per declared unit	15 kg
Functional unit	1 m² of PROMATECT®-L500 installed with a thickness of 30 mm, a reference service life of 60 years and its related impacts over the cradle to grave life-cycle modules
Reference service life	60 years

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Not declared = ND.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials such as the various types of process water; other consumables used during production were neglectable). Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage.

The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The extra raw materials and energy required to cover production losses and waste were included in the input data and derived directly from factory ERP data, which records both raw material consumption and finished product volumes; therefore, no assumptions were required regarding production loss volumes.

Packaging materials for the final products, including wooden pallets, straps, and carton covers, were extracted from the ERP system and linked to the corresponding finished product volumes. Raw material packaging was excluded due to its negligible contribution, as more than 90% of raw materials are delivered in bulk and without packaging.

The main ancillary material is process water. Process water consumption and wastewater generation were first allocated to departments based on the volume of calcium silicate slurry consumed and, in the filter press department, further allocated according to the volume of semi-finished products produced.

Raw material transport was modelled based on the distance between each production site and the manufacturing plant, considering the relevant transport modes, including bulk sea freight, road transport, and rail. Ecoinvent default transport scenarios were applied. More than 90% of raw materials are sourced within 200 km. No assumptions were required regarding transport distances or waste transport scenarios in module A3, as site-specific data were available.

Production waste may be recycled either internally or externally. Where a product consumes more internally recycled waste in module A1 than it generates in module A3, the additional amount is accounted for as secondary material input, in addition to internally recovered dust. Conversely, where a product generates more waste in A3 than it consumes in A1, the surplus is assumed to be externally recycled. This represents a conservative assumption, as part of this surplus waste may in practice be internally recycled into other products.

The electricity used in the manufacturing plant is 100% sourced from the renewable sources. The use of renewable energy in manufacturing is demonstrated through contractual instruments (GOs, RECs), and its use is ensured throughout the validity period of this EPD.
Losses occurring during electricity transmission were considered in the data.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

For the transportation from the production plant to the building site, a scenario was assumed with a transportation distance of 100 km and using a lorry as transportation method. For other transportation distances with lorry the impacts can be easily calculated by multiplying the impacts in module A4 with the lorry transport distance to the specific location and dividing by 100.
Installation (A5) of the product can be done in various ways, depending on the application. In this study boards are used in a duct application. The building installation phase (A5) includes the screws and energy for sawing and fixing the PROMATECT®-L500 boards, the PROMACOL-S (0.5 kg/m² installed), the waste produced during installation, the additional production needed to compensate for these losses and the treatment of construction waste.

During the installation, some losses may occur. For this study, an average loss rate of 5% is used (scenario considered for the calcium silicate losses: landfill, truck transport 50 km). All packaging material for the board is transported to EoL according to the following scenarios: landfill 50 km; recycling 100 km. Also waste treatment of the packaging materials is included, assuming 90% re-use/10% recycling for the wooden pallet, 100% recycling for the cardboard and 50% landfill/50% recycling for the plastic strap.

PRODUCT USE AND MAINTENANCE (B1-B7)

The product has an estimated reference service life of 60 years, providing the product is installed as per Etex recommendations. In such case, the product will last during its life of use generally without any requirements for maintenance, repair, replacement, or refurbishment, providing normal and no accidental conditions of usage are encountered. The product will also not need any operational energy nor operational water to fulfil its duty, once installed in the building.
The only impact during the use phase is that of carbonation, where some CO_2 is adsorbed from the atmosphere over the lifetime of the board. Depending on the application, the degree of carbonation will vary. The carbonation is calculated for the indoor use scenario without or with 'open' cover such as a paint and reported in the B1 module.
Air, soil, and water impacts during the use phase are not studied.

PRODUCT END OF LIFE (C1-C4, D)

Two possible end-of-life scenarios are considered for the boards in Europe and these scenarios are considered representative for the most probable alternatives among all possible scenarios:

Scenario 1: 100% landfilling scenario in Europe: 100% of boards, PROMACOL-S and screws from demolition wastes are going to inert landfill at end of life.
Scenario 2: 100% recycling scenario in Europe: 100% of boards, PROMACOL-S and screws from demolition wastes are going to recycling at end of life.

For the dismantling of the boards in C1, the same amount of energy was assumed as for the installation, but without the sawing. The transport of the waste to the end-of-life (C2) is considered to be 50 km by diesel powered truck from the plant in the landfilling scenarios and 100 km from the plant in the recycling scenario.

Outside the system boundaries, module D shows benefits and loads from the recycling processes:

In scenario 1 these are related to the recycling of the packaging materials, being the cardboard, wooden pallet and plastic straps, leaving the system in the installation process (A5).

In scenario 2 these are in addition to the recycling of the packaging materials from A5, related to the recycling of boards, the PROMACOL-S and the screws leaving the system in the waste processing step at the end-of-life (C3).

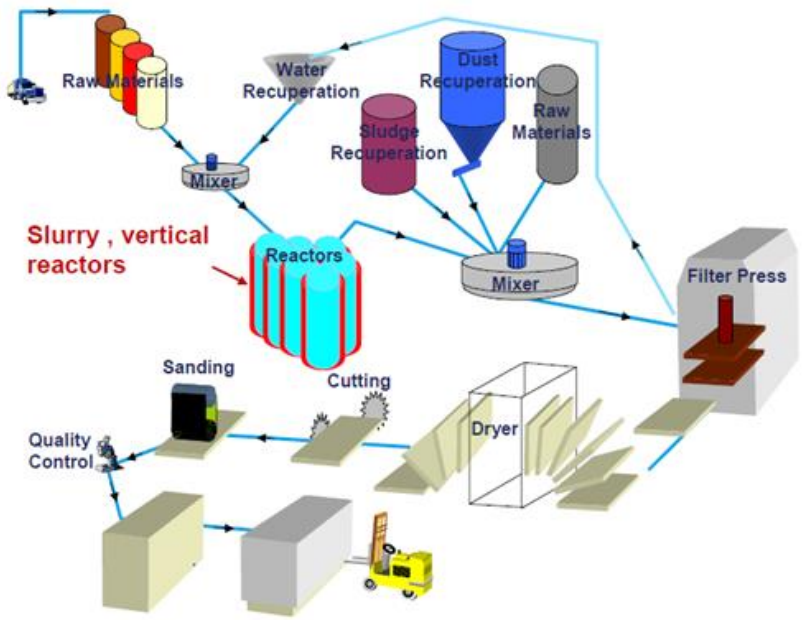
Loads considered are these for the recycling process (generation of wood chips from pallet, paper production from cardboard, steel production from recycled screws, PET production from the straps), whereas the benefits considered are the replacement of virgin material (wood chips from wooden pallet, kraft paper from the carton cover, metal from screws, PET from straps, and limestone from recycled board and PROMACOL-S).

The resources needed to reach the end of waste stage for the recycled boards and PROMACOL-S (crushed boards and PROMACOL-S) are included in the C module. No further loads are considered to prepare the crushed boards and PROMACOL-S for further use.

MANUFACTURING PROCESS

DESCRIPTION

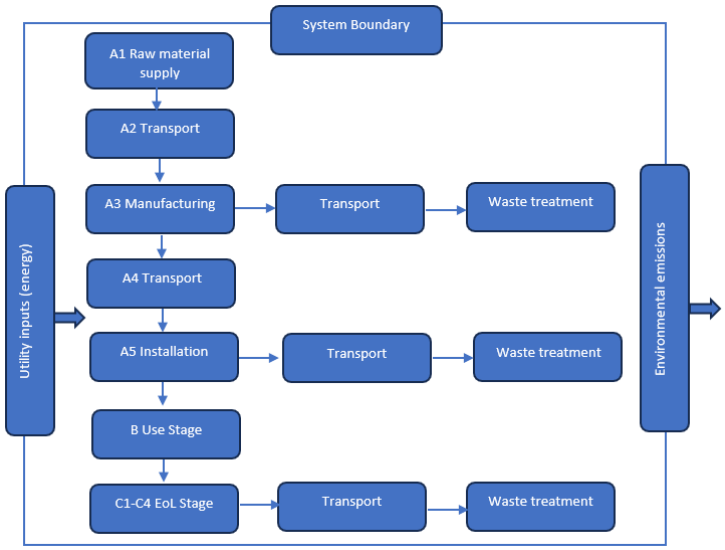
A mixture of sand, lime, and water is poured into the reactors to trigger a chemical reaction between the sand and the lime. This reaction occurs at high pressure and temperature and results in the formation of a specific calcium silicate compound called xonotlite. The xonotlite particles produced in this way have a very specific shape. Despite being almost completely hollow, these particles are very robust. Xonotlite is the basic raw material for PROMATECT®-L500. It is perfectly suited for the production of boards for passive fire protection in buildings. Then other raw materials are added. From this liquid mixture, the board is pressed to the desired density. The boards are formed using the filter-press process.



The boards coming out of the filter press are dried using a thermal drying process. At the exit of the oven, the boards are stacked to be temporarily stored in automatic intermediate storage. The boards are transported to the finishing line. Dust from sawing and sanding is extracted during finishing. This dust is collected and reused in a new production. The finished boards are packaged before being transported to the warehouse awaiting pickup.

The quality management system of the company and the production facility are certified according to ISO 9001. Promat commits to a clean, healthy and safe working environment for every person working in and for the company. The company and the manufacturing site have an environment, health and safety management system which is ISO 14001 and ISO 45001 certified.

See below the included life cycle stages within the system boundary of this study:



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

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

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

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are made according to the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging material	No allocation
Ancillary materials	Physical Properties
Manufacturing energy and waste	No allocation

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple products
Grouping method	Based on a representative product
Variation in GWP-fossil for A1-A3, %	-1 % to + 0%

The medium density calcium silicate fire protective boards PROMATECT®-L, PROMATECT®-L500, PROMATECT®-AD and VERMICULUX®-S covered by this EPD are produced at the same manufacturing site (Etex Building

Performance NV, Tisselt, Belgium) using the same filter-press production technology, similar raw materials and a comparable density range. The products are intended for similar fire protection applications and therefore fulfil the criteria for product grouping according to EN 15804 and ECO Platform guidance.

This EPD is representative exclusively for the above-mentioned products manufactured at the Tisselt site in Belgium. The declared environmental results are not intended to represent products manufactured at other production sites or products with substantially different formulations, production technologies or performance characteristics.

The results declared in this EPD are based on PROMATECT®-L500 with a thickness of 30 mm, which was selected as the representative product and exhibits the highest GWP-fossil impacts among the products covered. Life cycle assessment calculations were performed for each covered product and compared with the representative product to verify compliance with the applicable averaging requirements.
The variation analysis demonstrated that the environmental performance of the covered products remains within the allowable limits for grouping. For modules A1-A3, the variation in GWP-fossil ranges from -1% to +0% relative to the representative product. For modules A4, A5 and C1-C4, the variation ranges from -10% to +0%, while for module D the variation ranges from 0% to +10%.
As a consequence, the declared results are representative for all PROMATECT®-L, PROMATECT®-L500, PROMATECT®-AD and VERMICULUX®-S products manufactured in Tisselt, Belgium and covered by this EPD. The EPD shall not be used to represent products outside this product group or products manufactured outside the geographical scope defined above.

Biogenic content in product and packaging varies between -20/+2% compared to the value declared of the representative product. Contents declared as percentage varies in the range of +/- 0,5 %.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.3. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044.

The EPD Generator uses Ecoinvent 3.10.1 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1 environmental data sources follow the methodology ‘allocation, Cut-off, EN 15804+A2‘.
- Electricity transmission and distribution losses :
https://data.worldbank.org/indicator/EG.ELC.LOSS.ZS
- CO2 uptake by carbonatation:
EN16757 Sustainability of construction works - Environmental product declarations - Product Category rules for concrete and concrete elements; annex BB
https://www.greenbooklive.com/filelibrary/EN_15804/BRE-PN514-EN15804-A2-PCR-V3.1.pdf

ENVIRONMENTAL IMPACT DATA

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.

Two end- of- life scenarios have been calculated: “100% landfill” (referred in the tables as modules C2/1, C3/1, C4/1 and D/1) and “100% recycling” (referred in the tables as modules C2/2; C3/2; C4/2 and D/2).

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
GWP – total[1)]	kg CO_2e	1,61E+01	2,96E-01	2,39E+00	-3,33E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,25E-03	1,48E-01	2,96E-01	0,00E+00	4,75E-01	4,75E-01	0,00E+00	-7,71E-02	-1,11E-01
GWP – fossil	kg CO_2e	1,74E+01	2,95E-01	1,48E+00	-3,33E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,24E-03	1,48E-01	2,96E-01	0,00E+00	9,75E-02	9,74E-02	0,00E+00	1,46E-01	1,12E-01
GWP – biogenic	kg CO_2e	-1,29E+00	5,94E-05	9,08E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,72E-06	2,97E-05	5,95E-05	0,00E+00	3,78E-01	3,78E-01	0,00E+00	-2,24E-01	-2,24E-01
GWP – LULUC	kg CO_2e	5,10E-03	1,06E-04	1,02E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,32E-06	5,31E-05	1,06E-04	0,00E+00	5,84E-05	5,57E-05	0,00E+00	1,18E-03	1,22E-03
Ozone depletion pot.	kg CFC-$_{11}$e	4,82E-07	5,88E-09	2,76E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,82E-11	2,95E-09	5,89E-09	0,00E+00	6,31E-10	2,82E-09	0,00E+00	-1,41E-08	-1,43E-08
Acidification potential	mol H^+e	3,01E-02	6,15E-04	6,35E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,28E-06	3,08E-04	6,16E-04	0,00E+00	5,54E-04	6,90E-04	0,00E+00	7,61E-04	-2,75E-05
EP-freshwater[2)]	kg Pe	1,36E-03	1,99E-05	1,23E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,35E-07	9,97E-06	1,99E-05	0,00E+00	4,39E-05	8,00E-06	0,00E+00	3,13E-05	3,34E-05
EP-marine	kg Ne	1,07E-02	1,48E-04	9,91E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,41E-06	7,40E-05	1,48E-04	0,00E+00	1,10E-04	2,63E-04	0,00E+00	1,37E-04	-1,46E-04
EP-terrestrial	mol Ne	9,39E-02	1,59E-03	1,00E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,48E-05	7,98E-04	1,60E-03	0,00E+00	1,20E-03	2,87E-03	0,00E+00	1,38E-03	-2,65E-03
POCP (“smog”)[3)]	kg NMVOCe	3,88E-02	1,02E-03	3,59E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,35E-06	5,12E-04	1,02E-03	0,00E+00	4,40E-04	1,03E-03	0,00E+00	4,25E-04	-4,63E-04
ADP-minerals & metals4)	kg Sbe	1,63E-04	9,84E-07	2,75E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,88E-08	4,93E-07	9,86E-07	0,00E+00	2,03E-06	1,55E-07	0,00E+00	3,83E-07	4,16E-08
ADP-fossil resources	MJ	1,81E+02	4,16E+00	1,66E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,54E-02	2,08E+00	4,16E+00	0,00E+00	1,04E+00	2,39E+00	0,00E+00	1,69E+00	1,49E+00
Water use[5)]	m^3e depr.	1,30E+01	2,07E-02	8,48E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,63E-03	1,04E-02	2,07E-02	0,00E+00	2,42E-02	6,89E-03	0,00E+00	1,27E-01	1,26E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
Particulate matter	Incidence	2,53E-07	2,18E-08	2,74E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,52E-11	1,09E-08	2,18E-08	0,00E+00	8,80E-09	1,57E-08	0,00E+00	8,18E-09	-2,43E-09
Ionizing radiation[6]	kBq U235e	3,42E-01	5,36E-03	2,83E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,03E-04	2,69E-03	5,37E-03	0,00E+00	4,54E-03	1,50E-03	0,00E+00	9,45E-03	2,10E-02
Ecotoxicity (freshwater)	CTUe	2,94E+01	5,53E-01	3,98E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,15E-02	2,77E-01	5,54E-01	0,00E+00	4,73E-01	2,00E-01	0,00E+00	4,73E-01	1,06E-01
Human toxicity, cancer	CTUh	2,64E-09	4,96E-11	2,46E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,46E-13	2,48E-11	4,97E-11	0,00E+00	1,83E-10	1,80E-11	0,00E+00	4,86E-11	2,39E-10
Human tox. non-cancer	CTUh	1,24E-07	2,63E-09	8,70E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,60E-11	1,32E-09	2,63E-09	0,00E+00	2,11E-09	4,12E-10	0,00E+00	1,37E-09	1,55E-09
SQP[7]	-	8,50E+01	2,51E+00	5,98E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,71E-02	1,26E+00	2,52E+00	0,00E+00	4,50E+01	4,71E+00	0,00E+00	2,53E+00	2,36E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
Renew. PER as energy[8]	MJ	3,65E+01	7,28E-02	2,09E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,91E-02	3,65E-02	7,29E-02	0,00E+00	1,31E-01	2,31E-02	0,00E+00	-5,20E-01	-4,56E-01
Renew. PER as material	MJ	1,09E+01	0,00E+00	-7,88E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,07E+00	-3,07E+00	0,00E+00	1,90E+00	1,90E+00
Total use of renew. PER	MJ	4,74E+01	7,28E-02	-5,78E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,91E-02	3,65E-02	7,29E-02	0,00E+00	-2,94E+00	-3,05E+00	0,00E+00	1,38E+00	1,44E+00
Non-re. PER as energy	MJ	1,87E+02	4,16E+00	1,68E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,54E-02	2,08E+00	4,16E+00	0,00E+00	1,05E+00	2,39E+00	0,00E+00	1,66E+00	1,46E+00
Non-re. PER as material	MJ	2,08E+00	0,00E+00	-4,92E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,58E+00	-1,58E+00	0,00E+00	7,00E-02	7,00E-02
Total use of non-re. PER	MJ	1,89E+02	4,16E+00	1,63E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,54E-02	2,08E+00	4,16E+00	0,00E+00	-5,39E-01	8,06E-01	0,00E+00	1,73E+00	1,53E+00
Secondary materials	kg	1,07E+00	1,93E-03	1,31E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,19E-05	9,67E-04	1,93E-03	0,00E+00	7,93E-03	6,01E-04	0,00E+00	7,57E-02	1,84E-01
Renew. secondary fuels	MJ	2,13E+00	2,44E-05	1,06E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,41E-07	1,22E-05	2,45E-05	0,00E+00	8,83E-06	1,24E-05	0,00E+00	1,65E-06	-1,27E-06
Non-ren. secondary fuels	MJ	3,43E+00	0,00E+00	1,71E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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	m^3	2,84E-01	5,66E-04	1,99E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,91E-05	2,84E-04	5,67E-04	0,00E+00	5,73E-04	2,48E-03	0,00E+00	3,03E-03	3,25E-03

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
Hazardous waste	kg	1,95E-01	6,04E-03	3,34E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,63E-04	3,03E-03	6,05E-03	0,00E+00	2,50E-02	2,64E-03	0,00E+00	1,96E-02	3,65E-02
Non-hazardous waste	kg	1,19E+02	1,28E-01	7,05E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,84E-03	6,39E-02	1,28E-01	0,00E+00	2,41E-01	6,03E-02	0,00E+00	2,20E-01	1,98E-01
Radioactive waste	kg	1,23E-04	1,33E-06	1,49E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,57E-08	6,67E-07	1,33E-06	0,00E+00	1,15E-06	3,66E-07	0,00E+00	2,25E-06	5,22E-06

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
Components for re-use	kg	0,00E+00	0,00E+00	4,48E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	3,92E+00	0,00E+00	3,44E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,56E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
Global Warming Pot.	kg CO_2e	1,73E+01	2,94E-01	1,47E+00	-3,33E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,23E-03	1,47E-01	2,94E-01	0,00E+00	9,70E-02	9,65E-02	0,00E+00	1,47E-01	1,13E-01
Ozone depletion Pot.	kg CFC_{-11}e	3,98E-07	4,68E-09	2,28E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,67E-11	2,34E-09	4,69E-09	0,00E+00	5,49E-10	2,24E-09	0,00E+00	-9,15E-09	-9,30E-09
Acidification	kg SO_2e	2,32E-02	4,94E-04	5,25E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,81E-06	2,47E-04	4,95E-04	0,00E+00	4,53E-04	5,11E-04	0,00E+00	6,41E-04	1,31E-04
Eutrophication	kg PO_4^3e	6,93E-03	1,25E-04	6,02E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,22E-06	6,25E-05	1,25E-04	0,00E+00	6,89E-05	1,62E-04	0,00E+00	1,29E-04	2,12E-06
POCP (“smog”)	kg C_2H_4e	2,53E-03	5,22E-05	3,45E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,96E-07	2,62E-05	5,23E-05	0,00E+00	5,49E-05	4,83E-05	0,00E+00	3,77E-05	-2,37E-06
ADP-elements	kg Sbe	1,64E-04	9,61E-07	2,71E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,85E-08	4,82E-07	9,63E-07	0,00E+00	2,02E-06	1,52E-07	0,00E+00	3,50E-07	2,33E-10
ADP-fossil	MJ	1,77E+02	4,07E+00	1,58E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,37E-02	2,04E+00	4,08E+00	0,00E+00	9,68E-01	2,37E+00	0,00E+00	1,55E+00	1,14E+00

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
GWP-GHG[9)]	kg CO_2e	1,74E+01	2,96E-01	1,49E+00	-3,33E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,24E-03	1,48E-01	2,96E-01	0,00E+00	9,76E-02	9,74E-02	0,00E+00	1,47E-01	1,14E-01

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero.

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

1. Heat and power co-generation, natural gas, 1MW electrical, lean burn, Belgium, Ecoinvent, 0.0297 kgCO2e/MJ
2. Heat production, natural gas, at industrial furnace >100kW, Belgium, Ecoinvent, 0.0773 kgCO2e/MJ
3. Market for propane, burned in building machine, World, Ecoinvent, 0.0945 kgCO2e/MJ
4. Electricity production, wind, 1-3MW turbine, onshore, Germany, Ecoinvent, 0.0207 kgCO2e/kWh
5. Electricity production, hydro, reservoir, alpine region, Norway, Ecoinvent, 0.0065 kgCO2e/kWh
6. Electricity production, photovoltaic, 570kWp open ground installation, multi-Si, Belgium, Ecoinvent, 0.0829 kgCO2e/kWh

Transport scenario documentation - A4 (Transport resources)

1. Transport, freight, lorry, 16-32 metric ton, diesel, EURO 6, 100 km

Transport scenario documentation A4

Scenario parameter	Value
Capacity utilization (including empty return) %	default Ecoinvent Scenario
Bulk density of transported products	519
Volume capacity utilization factor	<1

Installation at the building site (A5) - Scenario documentation

Scenario parameter	Value
Energy: type and consumption (MJ or kWh)	0,0253 kwh for cutting and fixing
Water use (m^3)	0
Ancillary materials: type and mass (kg)	97 g screws 500 g PROMACOL-S
Waste materials: type and mass (kg)	Wooden pallets: 498 g Carton cover: 97 g Straps: 2 g Cutting waste: 750 g
Waste materials: output routes	Re-use: 448 g (90 % of wooden pallets) Recycling: 148 g (10% of wooden pallets, 100 % carton, 50 % plastics) Landfill: 751 g (50 % plastic, 100 % cutting waste)
Direct emissions (kg)	0

Use stages scenario documentation - B2 Maintenance

Scenario information	Value
Maintenance process description	None
Maintenance cycle (per RSL)	0
Energy use (kWh/cycle)	0
Water use (m3 or litres/cycle)	0
Ancillary materials (kg/cycle)	0
Waste materials (kg/cycle)	0

Use stages scenario documentation - B3 Repair

Scenario information	Value
Repair & Inspection process description	None
Repair cycle (per RSL)	0
Energy use (kWh/cycle)	0
Water use (m3 or litres/cycle)	0
Ancillary materials (kg/cycle)	0
Waste materials (kg/cycle)	0

Use stages scenario documentation - B4 Replacement

Scenario information	Value
Replacement cycle (per RSL)	0
Activity type, Energy use (kWh)	0
Exchange of worn parts, mass (kg)	0

Use stages scenario documentation - B5 Refurbishment

Scenario information	Value
Refurbishment process, cycle (per RSL)	0
Energy use (kWh/cycle)	0
Ancillary materials (kg/cycle)	0
Waste materials (kg/cycle)	0

Use stages scenario documentation - B6-B7 Use of energy and use of water

Scenario information	Value
Type of energy, consumption (kWh)	0
Freshwater consumption (m3)	0
Performance characteristics, E.g, Power rating, efficiency, capacity	Not applicable

End-of-life scenario documentation - C1-C4_landfilling scenario (Data source)

1. Market group for electricity, low voltage, Ecoinvent, 0.012 kWh
2. Treatment of inert waste, inert material landfill, Ecoinvent, 15.597 kg

End-of-life scenario documentation - C1-C4_recycling scenario (Data source)

1. Market group for electricity, low voltage, Ecoinvent, 0.012 kWh
2. Sorting and pressing of iron scrap, Ecoinvent, Materials for recycling, 0.097 kg
3. Rock crushing, Ecoinvent, Materials for recycling, 15.5 kg

Scenario information	Value
Scenario assumptions on transportation	Diesel powered truck, 50 km in landfill scenario and 100km in recycling scenario

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

Magaly Gonzalez Vazquez as an authorized verifier for EPD Hub Limited
23.10.2026



VERIFIED ISO 14025