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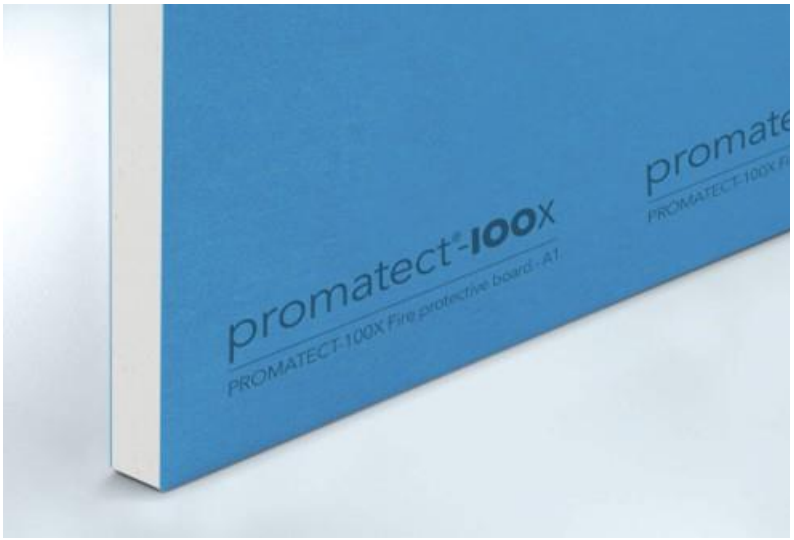
# ENVIRONMENTAL PRODUCT DECLARATION

## IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

**PROMATECT®-100X (20 mm)**

Etex Building Performance NV




**EPD HUB, HUB-4393**
Published on 23.01.2026, last updated on 23.01.2031

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

Promat by etex

# GENERAL INFORMATION

## MANUFACTURER

| | |
|---|---|
| Manufacturer | Etex Building Performance NV |
| Address | Bormstraat 24, B-2830 Tisselt, Belgium |
| Contact details | david.saenz@pladur.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<br>EN 17328 Complementary Product Category Rules for Gypsum-based Construction Products |
| Sector | Construction product |
| Category of EPD | Third party verified EPD |
| Parent EPD number | |
| Scope of the EPD | Cradle to gate with options, A4-B7, and modules C1-C4, D |
| EPD author | Julien Soulhat, Sustainability & Technical Manager, Etex Building Performance International sas. |
| EPD verification | Independent verification of this EPD and data, according to ISO 14025:<br>☐ 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 | PROMATECT®-100X (20 mm) |
| Additional labels | - |
| Product reference | - |
| Place(s) of raw material origin | Spain and the EU |
| Place of production | Gelsa, Espagne |
| Place(s) of installation and use | Europe |
| Period for data | January 1st 2023 to December 31st 2 |
| Averaging in EPD | No grouping |
| Variation in GWP-fossil for A1-A3 (%) | n/a |
| GTIN (Global Trade Item Number) | - |
| NOBB (Norwegian Building Product Database) | - |
| A1-A3 Specific data (%) | 100 |

## ENVIRONMENTAL DATA SUMMARY

| | |
|---|---|
| **Declared unit** | 1 m² of board (installed), with 20 mm thickness and 19 kg/m² |
| **Declared unit mass** | 19 kg |
| **GWP-fossil, A1-A3 ($kgCO_2e$)** | 3,80 |
| **GWP-total, A1-A3 ($kgCO_2e$)** | 3,54 |
| **Secondary material, inputs (%)** | 3,63 |
| **Secondary material, outputs (%)** | 19,8 |
| **Total energy use, A1-A3 (kWh)** | 16,8 |
| **Net freshwater use, A1-A3 ($m^3$)** | 0,03 |

# PRODUCT AND MANUFACTURER

## ABOUT THE MANUFACTURER

Etex Building Performance NV is part of the global Etex Group of Companies, which operates across Europe, Africa, Near & Middle East and South America. Etex Building Performance NV provides, under the Promat brand, expert solutions for passive fire protection for the construction sector in structural protection, fire compartmentation, fire stopping, ventilation and smoke extraction ducts. Promat offer sustainable solutions that protect lives and assets, enhance comfort, optimise process efficiency, minimise the loss of space and energy and help reduce CO2 emissions.

## PRODUCT DESCRIPTION

PROMATECT®-100X is a non-combustible (A1) fire protective board, based on the PromaX® technology, specifically designed for fire compartmentation in buildings, such as partitions and ceilings, when high fire protection performance is required. It is made of aerated calcium sulphate di-hydrate, reinforcing glass fibres, functional additives and water. The core is reinforced by coloured blue glass-mat facers on the front and back. The product exhibits square or tapered edges on its longitudinal sides, square edges on its transversal sides and it is available in a variety of lengths.

PROMATECT®-100X is CE marked according to ETA 20/0932 as a fire-rated panel according to EAD 350142-00-1106.

This EPD covers the 20 mm PROMATECT®-100X made in Gelsa, Spain.

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

## PRODUCT RAW MATERIAL MAIN COMPOSITION

| Raw material category | Amount, mass % | Material origin |
|---|---|---|
| Metals | 0 | n/a |
| Minerals | 98,8% | Spain and EU |
| Fossil materials | 0,5% | EU |
| Bio-based materials | 0,7% | EU |

## BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

| | |
|---|---|
| Biogenic carbon content in product, kg C | 0,062 |
| Biogenic carbon content in packaging, kg C | 0,024 |

## FUNCTIONAL UNIT AND SERVICE LIFE

| | |
|---|---|
| Declared unit | 1 m² of board (installed), with 20 mm thickness and 19 kg/m² |
| Mass per declared unit | 19 kg |
| Functional unit | 1m² of board installed on a frame, fixed on a support (by mean of mechanical fixings) with joint treatment. over a period of 50 years. |
| Reference service life | 50 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 |

*Modules not declared = MND. Modules not relevant = MNR*

## 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. 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.

A market-based approach is used in modelling the electricity mix utilized in the factory, including the electricity produced from biogas and from photovoltaic sources.

Transport for raw materials considers
the distance from the extraction or manufacturing location of the raw material to the production plant and the modelling of the relevant transportation type (e.g. road lorry, train, sea fret, ...) for each raw material.

Transport assumption has also been made to consider the impact of the transport of diesel and/or propane which are delivered by road lorries to the plant. Regarding the energy used: 1) propane is sourced locally from domestic production, 2) diesel is also sourced locally from domestic production using a mix of local oil fields and imported crude oil, 3) natural gas comes within a mix of local production and imports, 4) 100% of the electricity used in the manufacturing plants is sourced from renewable sources (solar, co generation using biogas from biomass).

Plant specific manufacturing waste data is reported by each manufacturing location into the Etex's internal information system. Manufacturing wastes are of the following types: 1) Plasterboard wastes generated on the production lines, reprocessed internally and used back in the process after treatment (no transport), 2) Liner wastes coming from liner's rolls feeding the production line with front and back liner, reprocessed by specialized partners for treatment and recycling.

No process liquid water is released to the environment whereas water vapour is released in the atmosphere during calcination and drying. The transport assumptions for manufacturing wastes are based on the following principle: 1) transportation distances are calculated taking into account the address of the plant where the waste is issued and the address of the third party location where the waste is treated (Google map has been used to calculate the distance), 2) the transport method reflects the actual type of transport used to convey the wastes to third party location (i.e. road transport).

The product is delivered on bio-based flex spacers, using bio-based corner reinforcement and plastic straps.

The use of green energy in manufacturing is demonstrated through contractual instruments (GOs, RECs, etc.), and its use is ensured throughout the validity period of this EPD.

## 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.

Plasterboard products are delivered by road lorry from the manufacturing location to stockists and construction sites across Spain and Portugal. The average delivery distance considered in this study is 1000 km, deducted from supply chain data analysis.

The two most common drywall installations for the boards are metal framing partitions and ceilings. A variety of building systems and components are used to deliver the required performances but are outside the scope of this declaration. However, the use of screw fixings, jointing material and joint tape is common to all applications and the consumption of these are declared within this section as installation resources. A small quantity of water is also consumed in the mixing of jointing materials. We have considered that no significant amount of energy is consumed during installation. Whereas a negligeable amount of dust due to manual cutting can be released in situ (see the product technical safety datasheet for more information), we have considered that Installation does not produce any significant emissions.

5% Installation waste is considered. Installation wastes (plasterboard, packaging and installation resources) are transported by truck either to a recycling facility (20%) over a distance of 250 km or to landfill (80%) over a distance of 50 km.

## PRODUCT USE AND MAINTENANCE (B1-B7)

The product has a reference service life as stated above, providing the product is installed as per Promat recommendations. In such case, the product will last during its life of use without any requirements for maintenance, repair, replacement, or refurbishment throughout this period, 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.
Air, soil, and water impacts during the use phase have not been studied.
Air, soil, and water impacts during the use phase have not been studied.

## PRODUCT END OF LIFE (C1-C4, D)

At End of Life, the product is removed manually and transported by truck either to a recycling facility (20%) or to landfill (80%). No energy has been considered for C1 as it has been assumed that demolition is carried out without power tools or is using negligible amounts of energy. Module C2 is calculated using a distance of 250 km for recycling (20% of total quantity collected) or 50 km for landfilling (remaining 80%). We confirm the representativeness of this EOL scenario and that it is likely to occur. Plasterboards, once recycled, provide gypsum in the form of powder which can be directly used in the process.

For the evaluation of the Loads and Benefits, we have considered the load of recycling of the installation wastes in A5 and the product at EOL (20% in mass) and the benefits of not using 20% of natural gypsum in A1. We have also considered the transfer of energy and biogenic CO2 content to next product life.

# MANUFACTURING PROCESS

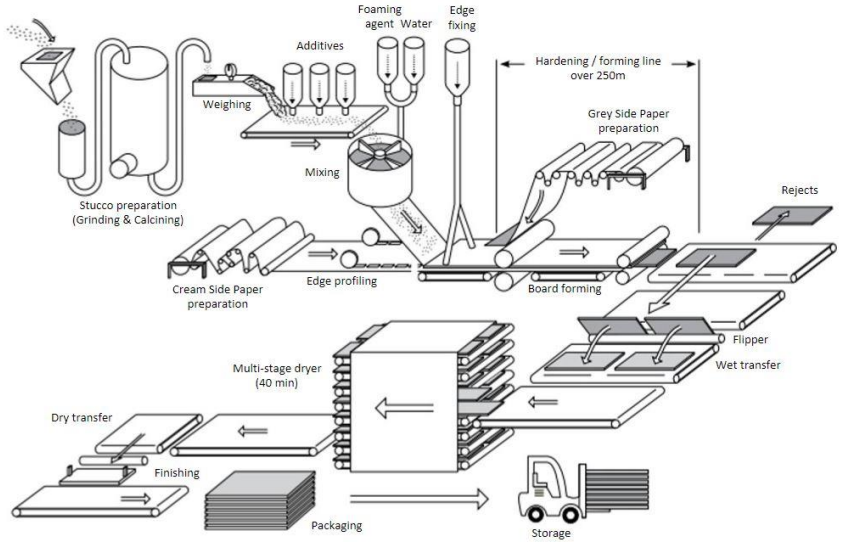
The gypsum mix is milled and calcined to plaster by heating to around 160 Celsius, then stored in silos. The plaster is then mixed with additives, wood fibres and water to form a slurry in which the rehydration back to gypsum begins. The slurry is injected between the face and back glass mat liners in a forming process which defines board thickness and width. During plaster setting over several minutes a high strength mechanical bond forms at the gypsum/ liner interface.

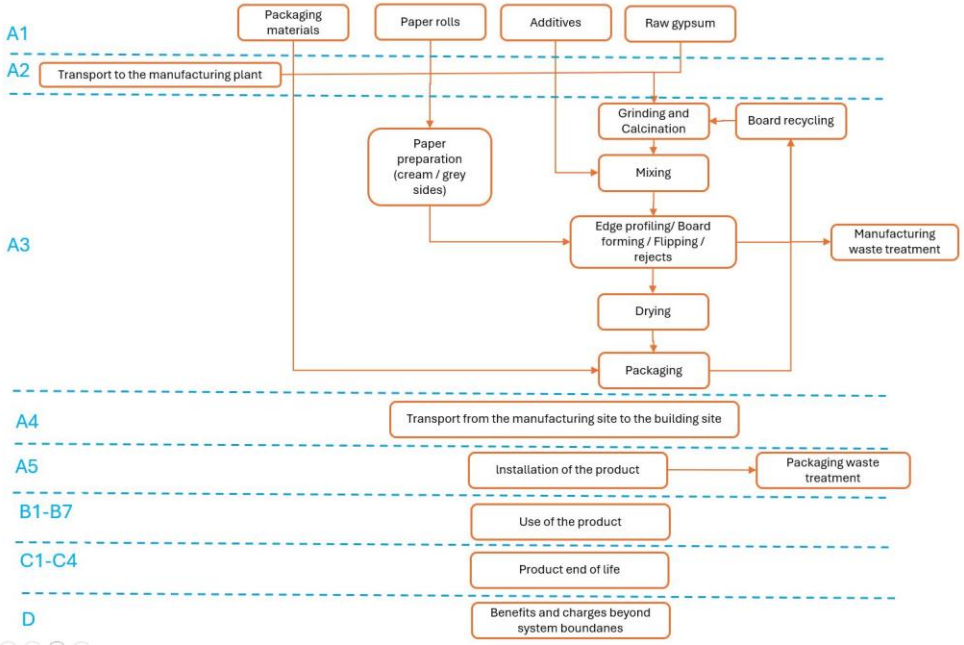
Excess water is removed from boards by passing them through a fan-assisted oven. During drying starch migrates to the surface of the gypsum core, adding further strength by means of a chemical bond. Dried boards are cut to size and then packed for storage and distribution.

See the manufacturing diagram and Life Cycle Flow diagram on the right.

Plasterboards are manufactured using state-of-the-art production equipment and following rigorous quality assurance standards, complying with EN ISO 9001:2015 and EN ISO 14001:2015, certified by third parties.

The product is manufactured on the production line in Gelsa.



# 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.

The following processes are considered below cut-off:
- Packaging of raw materials, as the main raw materials (i.e. largest amounts), such as gypsum come in bulk.
- Ancillary materials for production other than lubricating oil
- Infrastructure and land use of the factory
- Environmental impacts caused by the personnel of the production plants are not included in the LCA, e.g. waste from the cafeteria and sanitary installations, accidental pollution caused by human mistakes, or environmental effects caused by commuter traffic. Heating or cooling of the plants in order to ensure a comfortable indoor climate for the personnel for example is also neglected.

## 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 done as per 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 | Allocated by mass or volume |
| Ancillary materials | Allocated by mass or volume |
| Manufacturing energy and waste | Allocated by mass or volume |

## PRODUCT & MANUFACTURING SITES GROUPING

| | |
|---|---|
| Type of grouping | No grouping |
| Grouping method | Not applicable |
| Variation in GWP-fossil for A1-A3, % | n/a |

This EPD is product and factory specific.

## LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1 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‘.

# 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.*

## 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 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GWP – total[1)] | kg $CO_2$e | 3,54E+00 | 1,97E+00 | 5,12E-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 | 3,31E-01 | 1,61E-01 | 2,88E-01 | -3,21E-02 |
| GWP – fossil | kg $CO_2$e | 3,80E+00 | 1,97E+00 | 4,35E-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 | 3,31E-01 | 1,13E-01 | 9,68E-02 | -2,69E-02 |
| GWP – biogenic | kg $CO_2$e | -2,90E-01 | 4,30E-04 | 7,57E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,96E-05 | 4,77E-02 | 1,91E-01 | -5,17E-03 |
| GWP – LULUC | kg $CO_2$e | 2,93E-02 | 7,67E-04 | 1,63E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,19E-04 | 3,42E-05 | 5,53E-05 | 2,94E-05 |
| Ozone depletion pot. | kg $CFC_{-11}$e | 1,35E-07 | 4,11E-08 | 1,02E-08 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,59E-09 | 2,44E-09 | 2,80E-09 | 2,22E-09 |
| Acidification potential | mol $H^+$e | 1,12E-02 | 4,65E-03 | 6,61E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,89E-04 | 1,07E-01 | 6,86E-04 | 1,07E-01 |
| EP-freshwater[2)] | kg Pe | 3,55E-04 | 1,38E-04 | 6,17E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,23E-05 | 1,34E-05 | 7,96E-06 | 1,13E-05 |
| EP-marine | kg Ne | 3,01E-03 | 1,22E-03 | 3,68E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,66E-04 | 2,94E-04 | 2,62E-04 | 2,20E-04 |
| EP-terrestrial | mol Ne | 3,05E-02 | 1,32E-02 | 3,81E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,79E-03 | 2,64E-03 | 2,86E-03 | 1,60E-03 |
| POCP ("smog")[3)] | kg NMVOCe | 1,23E-02 | 8,08E-03 | 1,90E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,15E-03 | 7,42E-03 | 1,02E-03 | 7,18E-03 |
| ADP-minerals & metals[4)] | kg Sbe | 7,24E-04 | 5,64E-06 | 4,87E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,10E-06 | 4,93E-07 | 1,54E-07 | -1,39E-04 |
| ADP-fossil resources | MJ | 6,07E+01 | 2,96E+01 | 6,34E+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 | 4,66E+00 | 1,82E+00 | 2,38E+00 | 1,63E+00 |
| Water use[5)] | $m^3$e depr. | 1,15E+00 | 1,52E-01 | 9,11E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,32E-02 | 6,13E-02 | 6,86E-03 | 5,75E-02 |

*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 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Particulate matter | Incidence | 1,01E-07 | 1,92E-07 | 2,74E-08 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,44E-08 | 1,26E-07 | 1,56E-08 | 1,21E-07 |
| Ionizing radiation[6] | kBq U235e | 1,27E-01 | 3,57E-02 | 1,31E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,01E-03 | 9,73E-03 | 1,49E-03 | 9,06E-03 |
| Ecotoxicity (freshwater) | CTUe | 8,44E+00 | 3,49E+00 | 9,65E-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 | 6,20E-01 | 1,23E+00 | 1,99E-01 | 1,11E+00 |
| Human toxicity, cancer | CTUh | 8,80E-10 | 3,28E-10 | 8,66E-11 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,56E-11 | 1,02E-10 | 1,78E-11 | 7,98E-11 |
| Human tox. non-cancer | CTUh | 3,11E-08 | 1,91E-08 | 3,51E-09 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,95E-09 | 5,79E-09 | 4,10E-10 | 5,72E-09 |
| SQP[7] | - | 8,03E+00 | 2,98E+01 | 4,95E+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 | 2,82E+00 | 2,14E+00 | 4,68E+00 | 2,05E+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 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Renew. PER as energy[8] | MJ | 2,11E+00 | 4,82E-01 | 5,00E-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 | 8,16E-02 | 1,77E-01 | 2,29E-02 | -1,39E-01 |
| Renew. PER as material | MJ | 6,49E-01 | 0,00E+00 | -1,41E-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 | -1,02E-01 | -4,06E-01 | 5,66E-01 |
| Total use of renew. PER | MJ | 2,76E+00 | 4,82E-01 | 3,59E-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 | 8,16E-02 | 7,54E-02 | -3,83E-01 | 4,27E-01 |
| Non-re. PER as energy | MJ | 5,82E+01 | 2,96E+01 | 6,20E+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 | 4,66E+00 | 1,82E+00 | 2,38E+00 | 1,64E+00 |
| Non-re. PER as material | MJ | 2,63E+00 | 0,00E+00 | -9,60E-02 | 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 | -5,07E-01 | -2,03E+00 | 6,22E-01 |
| Total use of non-re. PER | MJ | 6,09E+01 | 2,96E+01 | 6,11E+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 | 4,66E+00 | 1,31E+00 | 3,47E-01 | 2,26E+00 |
| Secondary materials | kg | 6,97E-01 | 1,28E-02 | 3,91E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,16E-03 | 9,86E-04 | 5,97E-04 | 2,49E-04 |
| Renew. secondary fuels | MJ | 6,56E-03 | 1,61E-04 | 6,36E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,74E-05 | 8,24E-06 | 1,24E-05 | -6,71E-03 |
| Non-ren. 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 | 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 | $m^3$ | 2,67E-02 | 4,37E-03 | -7,35E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,35E-04 | -1,41E-02 | 2,47E-03 | -1,42E-02 |

*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 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hazardous waste | kg | 2,21E-01 | 4,28E-02 | 1,82E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,77E-03 | 2,78E-02 | 2,62E-03 | 2,72E-02 |
| Non-hazardous waste | kg | 2,62E+00 | 8,57E-01 | 4,20E+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 | 1,43E-01 | 2,06E+01 | 6,00E-02 | 2,06E+01 |
| Radioactive waste | kg | 3,21E-05 | 8,82E-06 | 1,97E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,49E-06 | 2,28E-06 | 3,64E-07 | 2,11E-06 |

## END OF LIFE – OUTPUT FLOWS

| Impact category | Unit | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Components for re-use | kg | 0,00E+00 | 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 | 7,53E-04 | 0,00E+00 | 2,01E-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 | 3,88E+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 |
| 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 |
| 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 |
| 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 |

## ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

| Impact category | Unit | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Global Warming Pot. | kg $CO_2$e | 3,83E+00 | 1,96E+00 | 4,39E-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 | 3,29E-01 | 1,12E-01 | 9,59E-02 | -2,77E-02 |
| Ozone depletion Pot. | kg $CFC_{-11}$e | 1,11E-07 | 3,27E-08 | 8,28E-09 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,25E-09 | 1,99E-09 | 2,23E-09 | 1,82E-09 |
| Acidification | kg $SO_2$e | 8,81E-03 | 3,69E-03 | 5,90E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,54E-04 | 9,81E-02 | 5,08E-04 | 9,80E-02 |
| Eutrophication | kg $PO_4^3$e | 1,61E-02 | 9,21E-04 | 9,75E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,40E-04 | 5,07E-04 | 1,61E-04 | 2,90E-04 |
| POCP (“smog”) | kg $C_2H_4$e | 9,56E-04 | 3,76E-04 | 3,04E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,86E-05 | 3,94E-03 | 4,80E-05 | 3,93E-03 |
| ADP-elements | kg Sbe | 6,71E-05 | 5,50E-06 | 7,92E-06 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,08E-06 | 4,32E-07 | 1,51E-07 | 3,81E-07 |
| ADP-fossil | MJ | 5,85E+01 | 2,90E+01 | 6,10E+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 | 4,56E+00 | 1,66E+00 | 2,35E+00 | 1,49E+00 |

## ENVIRONMENTAL IMPACTS – FRENCH NATIONAL COMPLEMENTS

| Impact category | Unit | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADP-elements | kg Sbe | 6,71E-05 | 5,50E-06 | 3,83E-06 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,08E-06 | 4,32E-07 | 1,51E-07 | 3,81E-07 |
| Hazardous waste disposed | kg | 2,21E-01 | 4,28E-02 | 1,82E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,77E-03 | 2,78E-02 | 2,62E-03 | 2,72E-02 |
| Non-haz. waste disposed | kg | 2,62E+00 | 8,57E-01 | 4,20E+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 | 1,43E-01 | 2,06E+01 | 6,00E-02 | 2,06E+01 |
| Air pollution | $m^3$ | 1,36E+03 | 4,53E+02 | 1,47E+02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,95E+01 | 4,36E+02 | 2,21E+01 | 2,58E+02 |
| Water pollution | $m^3$ | 3,73E+01 | 1,62E+01 | 3,26E+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 | 2,58E+00 | 1,14E+00 | 1,21E+00 | 1,05E+00 |

## ADDITIONAL INDICATOR – GWP-GHG

| Impact category | Unit | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GWP-GHG[9)] | kg $CO_2e$ | 3,83E+00 | 1,97E+00 | 4,37E-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 | 3,31E-01 | 1,13E-01 | 9,69E-02 | -2,69E-02 |

*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.*

## ENVIRONMENTAL IMPACTS – BEPALINGSMETODE, NETHERLANDS

| Impact category | Unit | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shadow price | € | 7,06E-01 | 2,38E-01 | 2,24E-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 | 3,74E-02 | 3,29E+00 | 1,46E-02 | 3,28E+00 |
| Terrestrial ecotoxicity | DCB eq | 5,51E-02 | 7,03E-03 | 3,71E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,12E-03 | 1,61E-03 | 3,43E-04 | 1,55E-03 |
| Seawater ecotoxicity | DCB eq | 6,51E+02 | 2,88E+02 | 1,39E+03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 4,34E+01 | 2,70E+04 | 1,48E+01 | 2,70E+04 |
| Freshwater ecotoxicity | DCB eq | 1,34E-01 | 2,64E-02 | 9,99E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,91E-03 | 7,00E-03 | 1,18E-03 | 6,89E-03 |
| Human ecotoxicity | DCB eq | 2,84E+00 | 9,40E-01 | 3,60E-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 | 1,39E-01 | 1,97E+00 | 5,01E-02 | 1,96E+00 |
| EEE | 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 |
| ETE | 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 |
| ADP Fossil Fuels | kg Sbe | 2,81E-02 | 1,39E-02 | 2,63E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,19E-03 | 8,00E-04 | 1,13E-03 | 7,16E-04 |

## SCENARIO DOCUMENTATION

**Manufacturing energy scenario documentation**

| Scenario parameter | Value |
|---|---|
| Electricity data source and quality | 1) Heat and power co-generation, biogas, gas engine (Reference product: electricity, high voltage); Spain; Ecoinvent 3.10.1; 2) Electricity production, photovoltaic, 3kWp slanted-roof installation, multi-Si, panel, mounted (Reference product: electricity, low voltage); Spain; Ecoinvent 3.10.1. |
| Electricity CO2e / kWh | 0,15 kg CO2 eq. /kWh for 1), 0,065 kg CO2 eq. /kWh for 2) |
| District heating data source and quality | Market for heat, district or industrial, natural gas (Reference product: heat, district or industrial, natural gas), Spain; Ecoinvent 3.10.1. |
| District heating CO2e / kWh | 0,203 |

**Transport scenario documentation A4**

| Scenario parameter | Value |
|---|---|
| Fuel and vehicle type. Eg, electric truck, diesel powered truck | Road lorry >32 metric ton, EURO6 |
| Average transport distance, km | 1000 |
| Capacity utilization (including empty return) % | 56 |
| Bulk density of transported products | 900 |
| Volume capacity utilization factor | <1 |

**Installation scenario documentation A5**

| Scenario information | Value |
|---|---|
| Ancillary materials for installation (specified by material) / kg or other units as appropriate | 0,34 kg of gypsum compound<br>0,01875 of screws<br>0,009 kg of joint tape.<br>Total: 0,368 kg |
| Water use / $m^3$ | 0,00017 |
| Other resource use / kg | 0 |
| Quantitative description of energy type (regional mix) and consumption during the installation process / kWh or MJ | 0,00250 |
| Waste materials on the building site before waste processing, generated by the product's installation (specified by type) / kg | 1,02 |
| Output materials (specified by type) as result of waste processing at the building site e.g. collection for recycling, for energy recovery, disposal (specified by route) / kg | 0,2 |
| Direct emissions to ambient air, soil and water / kg | 0,17 |

**Use stages scenario documentation - B2 Maintenance**

| Scenario information | Value |
|---|---|
| Maintenance process / Description or source where description can be found | none |
| Maintenance cycle / Number per RSL or year *(Not applicable if only B2 is declared)* | 0 |
| Ancillary materials for maintenance, e.g. cleaning agent, specify materials / kg / cycle | 0 |
| Waste material resulting from maintenance (specify materials) / kg | 0 |
| Net fresh water consumption during maintenance / m³ | 0 |
| Energy input during maintenance, e.g. vacuum cleaning, energy carrier type, e.g. electricity, and amount, if applicable and relevant / kWh | 0 |

**Use stages scenario documentation - B3 Repair**

| Scenario information | Value |
|---|---|
| Repair process / Description or source where description can be found | none |
| Inspection Process / Description or source where description can be found | none |
| Repair cycle / Number per RSL or year | 0 |
| Ancillary materials, e.g., lubricant (specify materials) / kg or kg/cycle | 0 |
| Waste material resulting from repair (specify materials) / kg | 0 |
| Net fresh water consumption during repair / m³ | 0 |
| Energy input during repair, e.g., crane activity, energy carrier type, e.g., electricity, and amount / kWh/RSL, kWh/cycle | 0 |

**Use stages scenario documentation - B4 Replacement**

| Scenario information | Value |
|---|---|
| Replacement cycle / Number per RSL or year | 0 |
| Energy input during replacement, e.g., crane activity, energy carrier type, e.g., electricity and amount (if applicable and relevant) / kWh | 0 |
| Exchange of worn parts during the product's life cycle, e.g., zinc galvanized steel sheet (specify materials) / kg | 0 |

**Use stages scenario documentation - B5 Refurbishment**

| Scenario information | Value |
|---|---|
| Refurbishment process / Description or source where description can be found | none |
| Refurbishment cycle / Number per RSL or year | 0 |
| Energy input during refurbishment, e.g., crane activity, energy carrier type, e.g., electricity, and amount (if applicable and relevant) / kWh | 0 |
| Material input for refurbishment, e.g., bricks, including ancillary materials for the refurbishment process, e.g., lubricant (specify materials) / kg or kg/cycle | 0 |
| Waste material resulting from refurbishment (specify materials) / kg | 0 |
| Further assumptions for scenario development, e.g., frequency and time period of use, number of occupants / Units as appropriate | 0 |

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

| Scenario information | Value |
|---|---|
| Ancillary materials specified by material / kg or units as appropriate | 0 |
| Net fresh water consumption / $m^3$ | 0 |
| Type of energy carrier, e.g., electricity, natural gas, district heating / kWh | 0 |
| Power output of equipment / kW | 0 |
| Characteristic performance, e.g., energy efficiency, emissions, variation of performance with capacity utilization, etc. | 0 |
| Further assumptions for scenario development, e.g., frequency and period of use, number of occupants | 0 |

**End of life scenario documentation**

| Scenario information | Value |
|---|---|
| Collection process – kg collected separately | 19,39 |
| Collection process – kg collected with mixed waste | 0 |
| Recovery process – kg for re-use | 0 |
| Recovery process – kg for recycling | 3,88 |
| Recovery process – kg for energy recovery | 0 |
| Disposal (total) – kg for final deposition | 15,51 |
| Scenario assumptions e.g. transportation | 0 |

# 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 15802+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
23.01.2026

VERIFIED ISO 14025