

ENVIRONMENTAL PRODUCT DECLARATION

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

Isover ROBUST Terrace TP 30

Version date: 2025/12/18

Validity: 5 years

Validity date: 2030/12/17



INTERNATIONAL EPD SYSTEM

The International EPD® System

Programme operator: EPD international AB

Registration number: EPD-IES-0026579:001



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.



Isover, Saint-Gobain

General information

Programme information

| | |
|-------------------|--|
| PROGRAMME: | The International EPD® System |
| ADDRESS: | EPD International AB - Box 210 60 - SE-100 31 Stockholm - Sweden |
| WEBSITE: | www.environdec.com |
| E-MAIL: | support@environdec.com |

PCR information

Product Category Rules (PCR)

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

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

Complementary PCR: (c-PCR-005), 2019-12-20. Thermal insulation products (EN 16783:2017)

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: Martin Erlandsson, Carbonzero AB

Approved by: The International EPD® System

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

Ownership and limitation 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.

Information about EPD owner

Address and contact information of the EPD owner: Saint-Gobain Denmark A/S, Isover, EPD Specialist Team (EPDNordic@saint-gobain.com)

Description of the organization of the EPD owner: Saint-Gobain Denmark A/S Isover is producing insulation solutions for roofs, walls and floors. They have one production site in Denmark: Vamdrup.

Management system-related certification: ISO 9001 (Certificate no. DK016070) ISO 14001 (Certificate no. DK016069) ISO 45001 (Certificate no. DK016071) ISO 50001 (Certificate no. DK018748)

LCA Practitioner: Amy Stockwell, Amy.Stockwell@Saint-Gobain.com

Communication: The intended use of this EPD is for B2B communication.



Product information

Product name: Isover Robust Terrace TP

UN CPC CODE: 37990 Non-metallic mineral products n.e.c. (including mineral wool, expanded mineral materials, worked mica, articles of mica, non-electrical articles of graphite or other carbon and articles of peat)

Manufacturing site(s): Østermarksvej 4, 6580 Vamdrup, Denmark



Visual representation of the product:

Product description

Isover Robust Terrace TP are hard and rigid boards made of impregnated glass wool with extra high dimensional stability and compressive strength, which is ideal for foot traffic and loads.

If water penetrates the insulation, the open pore structure helps it dry out quickly and reduces the risk of moisture damage. It is important that the insulation is dry before laying the roofing felt to avoid building moisture.

The production site uses natural raw materials and fusion and fiberizing techniques to produce glass wool. The products are obtained in the form of a "glass wool mat" characterized by a soft and airy structure.

For more information: <https://www.saint-gobain.dk/isover>

Technical data/physical characteristics:

| TECHNICAL ASPECT | VALUE / DESCRIPTION |
|----------------------|--|
| Thermal resistance | 1 K.m ² .W ⁻¹ (UNE EN 12667) |
| Thermal conductivity | 0.037 W/(m.K) (UNE EN 12667) |
| Reaction to fire | A12-s1, d0 (UNE EN 12667) |
| Density | 130 kg/m ³ |

| APPLICATION | VALUE / DESCRIPTION |
|---|---|
| Intended use and key functionalities | Flat Roof Insulation and Roof Terrace |
| Expected influence on the operational aspects and impact of the building or other construction work | Isover Robust Terrace TP can withstand loads from foot traffic during installation. Isover recommends that other traffic be limited |

until the roof covering has been installed, as the insulation is not designed for heavy traffic. In general, attention must be paid to compressive strength and weight during installation.

Restrictions to a type of construction or building

None

Lifespan

50 years. When installed correctly, the product requires no maintenance and has the same lifespan as the rest of the building.

Content declaration

This EPD uses the 37 mm thickness as a reference. The content declaration is representative of this thickness.

Description of the main components and/or materials:

| Quantity for 1 functional unit | | 4.8 kg of finished product | | |
|--------------------------------|-----------|---|---|-----------------------------|
| Product components | Mass (kg) | Post-consumer recycled material (mass - % of product) | Biogenic material (mass - % of product) | Biogenic material (kg C/DU) |
| Mineral materials | 90-97% | 52% | 0% | 0 |
| > Recycled glass | 52 % | 52% | 0% | 0 |
| Additives | <1 % | 0% | 0.8% | 0.02 |
| Binder | 3-10% | 0% | 0 % | 0 |
| Sum | 100% | | | |
| Packaging materials | Mass (kg) | Mass - % (vs the product) | Biogenic material, weight- kg C/DU | |
| PE film | 0.05 | 0.6 % | 0 | |
| Paper label | 0.00002 | <0.0001% | <0.0001 | |
| Wooden pallet | 0.5 | 6.5 % | 0.21 | |

Hazardous substances

During the life cycle of the product, one or more hazardous substances listed in the “Candidate List of Substances of Very High Concern (SVHC) for authorization” have been used in a percentage higher than 0.1% of the weight of the product.

| Hazardous substances from the candidate list of SVHC | Ec No. | CAS No. | Mass-% (per DU) |
|--|-----------------------|------------|-----------------|
| Glass wool | 01-2119472313-44-0041 | 65997-17-3 | 90-97% |

The verifier and the program operator do not make any claim nor have any responsibility of the legality of the product.

LCA Information

| | |
|-------------------------------------|---|
| TYPE OF EPD | Cradle to grave and module D |
| FUNCTIONAL UNIT | Providing a thermal insulation on 1 m ² of product with a thermal resistance of 1 K.m ² .W ⁻¹ and a thickness of 37 mm for 50 years. |
| CONVERSION FACTOR TO MASS | Density = 130 kg/m ² |
| SYSTEM BOUNDARIES | Cradle to grave and module D |
| REFERENCE SERVICE LIFE (RSL) | <p>The Reference Service Life (RSL) of the insulation product is 50 years, provided that the product is installed correctly into the building. This 50-year value is the amount of time that we recommend our products last without refurbishment and corresponds to standard building design life.</p> |
| CUT-OFF RULES | <p>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 5% of the whole mass and energy used, as well as the emissions to the environment occurred.</p> <p>Flows related to human activities, such as employee transport, are excluded.</p> <p>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.</p> |
| ALLOCATIONS | <p>Allocation has been avoided when possible, and when not possible, a mass allocation has been applied.</p> <p>The polluter pays and the modularity principles as well have been followed.</p> <p>Allocation of materials for recycling:</p> <ul style="list-style-type: none"> - 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. Post-consumer cullet end-of-waste state is considered to be reached after sorting at jobsite. All further transformation activities are included in the EPD. - 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. Pre-consumer cullet is considered a product with 0 impact following an economic allocation (the value of cullet is <1% of that of the glass). |

| | |
|--|---|
| 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: Denmark Data is collected from 1 production site, Vamdrup located in Denmark. Data collected for the year 2024 Guarantees of Origin are for 2025 |
| BACKGROUND DATA SOURCE | Databases Sphera CUP2024.2 and ecoinvent v.3.10 |
| SOFTWARE | GWP100, EN 15804+A2. Version: EF 3.1, February, 2023 Sphera LCA for experts (GaBi) 10 |

Data quality declaration

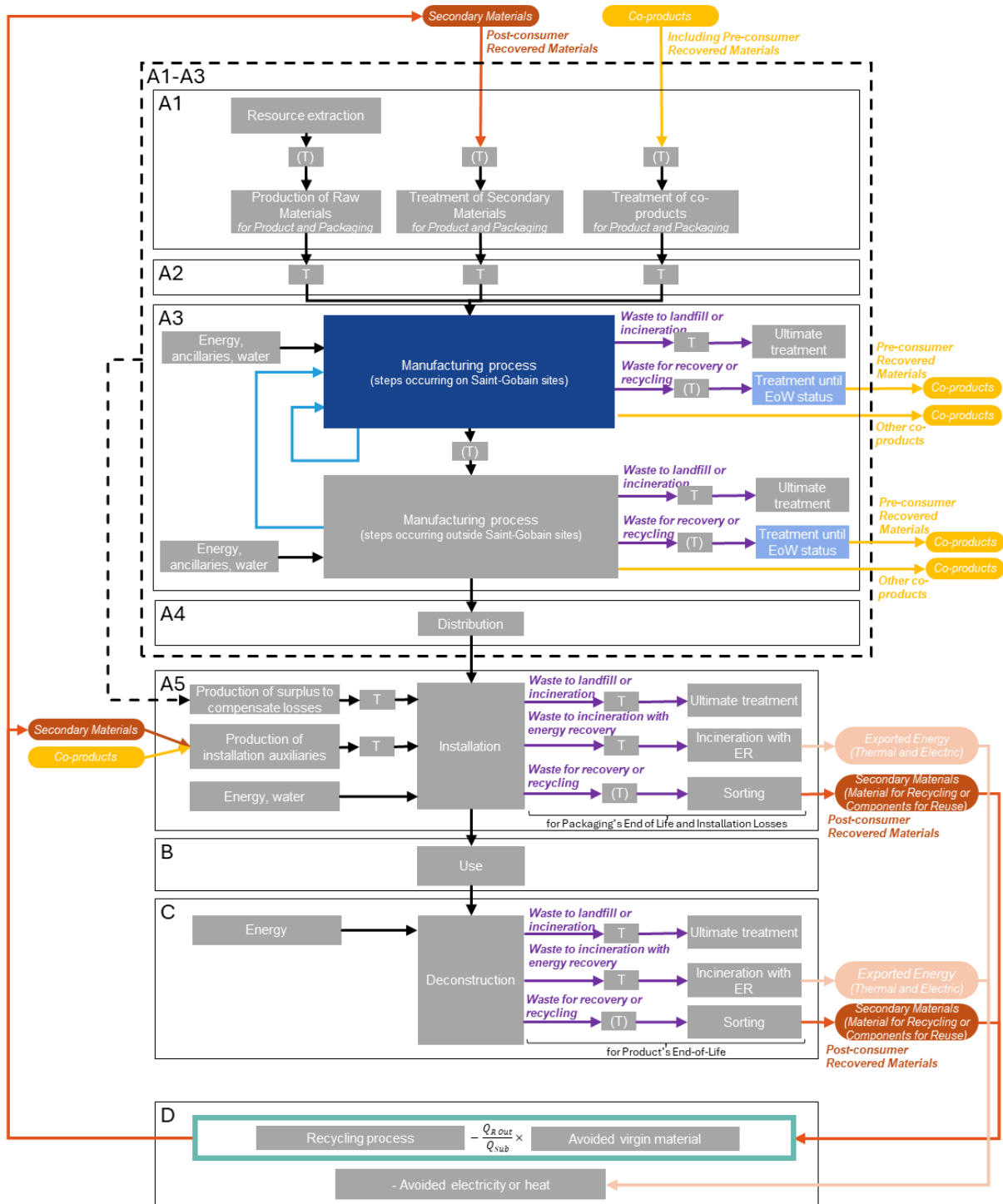
| | |
|--|--|
| Data Collection | 01/01/2024 – 31/12/2024 |
| Sites used | Vamdrup, Denmark |
| Geography | Produced in Denmark Sold in Denmark Use and disposal in Denmark |
| Technology | Mineral wool is made from high-temperature molten material that is blown away using centrifugal force to form fine cotton-like fibers. Then, a binder is sprayed on the material to form it, and the product is heated in an oven. Hereafter, the product is cut to size and packed. |
| Averaging | None |
| LCI/LCA database | Sphera CUP2024.2 and ecoinvent v.3.10 |
| Data Quality Scheme | EN 15804:2012+A2:2019, Annex E, Table E1 |
| Use of Fair data with more than 30 % of a core impact | None |
| Use of Poor relevant data | None |
| Use of Very Poor relevant data | None |
| Comment on data quality | All datasets are considered good or very good for all factors apart from geographical representativeness. Here some datasets (~1% GHG-GWP) may be considered only fair as they are global and not Europe specific. |

| PROCESS | SOURCE TYPE | SOURCE | REFERENCE YEAR | DATA CATEGORY | SHARE OF PRIMARY DATA OF GWP-GHG RESULTS FOR A1-A3 |
|------------------------------------|----------------|------------------------------|----------------|----------------|--|
| Raw Material from EPD | | | | | |
| Raw materials | Database | Sphera 2024.2/ecoinvent 3.10 | <5 years old | Secondary data | - |
| Packaging | Database | Sphera 2024.2/ecoinvent 3.10 | <5 years old | Secondary data | - |
| Plant data | | | | | |
| Electricity | Database | Sphera 2024.2/ecoinvent 3.10 | <5 years old | Primary data | 1 % |
| Emissions Specific | Collected data | EPD Owner | <5 years old | Primary data | 6 % |
| Thermal Energy | Database | Sphera 2024.2/ecoinvent 3.10 | <5 years old | Primary data | 22 % |
| Transport of RM | | | | | |
| Transport of RM Packaging | Database | Sphera 2024.2 | <5 years old | Secondary data | - |
| Transport of RM Product | Database | Sphera 2024.2 | <5 years old | Secondary data | - |
| Total share of primary data | | | | | 29% |

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 | EU | EU | DK | DK | DK | - | - | - | - | - | - | - | DK | DK | DK | DK | DK |
| Specific data used | 29% GWP-GHG | | | | | | | | | | | | | | | | |
| Variation products | 0% | | | | | | | | | | | | | | | | |
| Variation sites | 0% | | | | | | | | | | | | | | | | |



caption

| Type of flows | Location of life Cycle Step |
|---------------|-------------------------------|
| | Saint-Gobain site |
| | Saint-Gobain site or External |
| | External/Other |
| | External/Other |
| | External/Other |
| | External/Other |
| | Transport |

Life cycle stages

A1-A3. Product stage

The product stage of the mineral wool products is subdivided into 3 modules A1, A2 and A3 respectively “raw material supply”, “transport” and “manufacturing”.

A1. Raw materials supply

This module includes the extraction and transformation of raw materials.

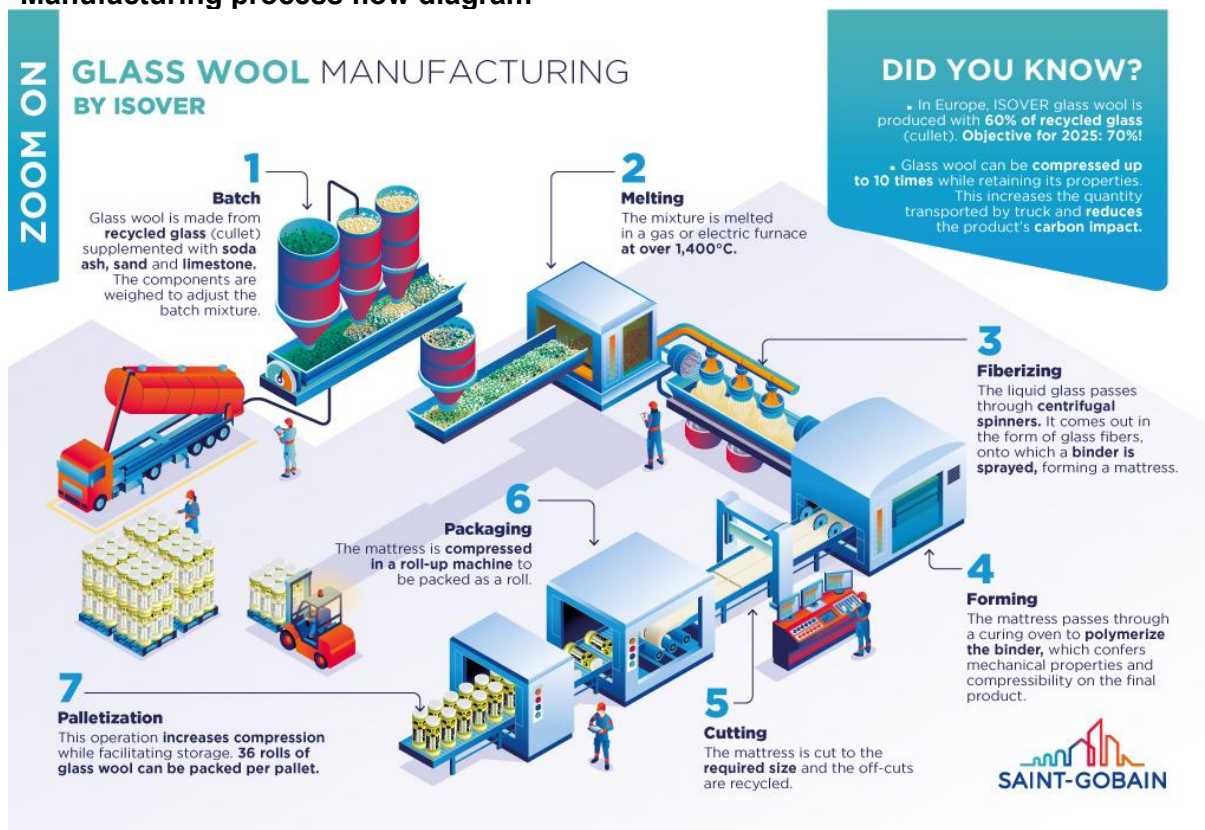
A2. Transport to the manufacturer

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

A3. Manufacturing

This module includes the manufacture of products (such as fusion, fiberizing, etc.) 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.

Manufacturing process flow diagram



Mineral wool is made from high-temperature molten glass that is blown away using centrifugal force to form fine cotton-like fibers. Then, a binder is sprayed on the material to form it, and the product is heated in an oven. Hereafter, the product is cut to size and packed.

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 27 t, real load 8 t, and consumption of 0.38 liters per km |
| Distance | 116 km by truck |
| Capacity utilization (including empty returns) | 100% of the capacity in volume 23% of the capacity in weight 30% of empty returns |
| Bulk density of transported products | 130 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.

Assumption additional to those stated in PCR 2.0.1 table 4:

- A loss of 2% of the product is considered during the installation
- The wooden pallet is reused 8 times before end-of-life
- No additional accessory, water, or energy was considered for the installation of the insulation product.
- Plastic waste disposal data from Eurostat for Denmark 2002.

| PARAMETER | VALUE / DESCRIPTION |
|---|---|
| Waste of materials on the building site before waste processing, generated by the product's installation (specified by type) | Product: 0.096 kg/DU Pallet: 0.50 kg/DU PE film: 0.049 kg/DU |
| Transport of packaging waste | Landfill: 80 km Recycling: 80 km |
| Output materials (specified by type) as results of waste processing at the building site, e.g., of collection for recycling, for energy recovery, disposal (specified by route) | Product losses: 0.096 kg/DU to landfill (100%) Pallet: 0.50 kg/DU to recycling (50%) and landfill (50%) PE film: 0.049kg/DU to recycling (82%), incineration with energy recovery (15%) and landfill (3%) |
| 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 following modules and processes according to PCR 2.0.1 Table 4:

- **C1: Deconstruction, demolition.** The deconstruction and/or dismantling of the product takes part of the demolition of the entire building. In our case, the energy considered for demolition is 1.1 kWh/tonne diesel.
- **C2: Transport to landfilling:** 80km by truck
- **C3: Waste processing for reuse, recovery, and/or recycling:** 0 kg
- **C4: Waste disposal:** 4.81 kg for landfilling including physical pre-treatment, compaction and site management.

Note that the landfill dataset includes compaction of waste, but the quantity of fuel used is not specified in the documentation.

D. Reuse/recovery/recycling potential

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

- Inputs of secondary raw 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 [m³ 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 functional unit of 1 m² of mineral wool with thermal resistance of 1 m².K.W⁻¹ for a thickness of 37 mm. To obtain results with different commercial thicknesses see additional information section.

Environmental Impacts

| | | PRODUCT STAGE | CONSTRUCTION STAGE | | USE STAGE | | | | | | | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE |
|---|---|------------------|-----------------------|-----------------|-----------|----------------|-----------|----------------|------------------|------------------------------|-----------------------------|--------------------------------------|--------------|------------------------|-------------|--|
| Environmental 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 |
|  | Climate Change total [kg CO2 eq.] | 2.79E+00 | 1.05E-01 | 8.68E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.91E-03 | 7.47E-02 | 0 | 1.31E-01 | 1.57E+00 |
| | Climate Change (fossil) [kg CO2 eq.] | 3.40E+00 | 1.03E-01 | 1.13E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.91E-03 | 7.47E-02 | 0 | 7.20E-02 | 1.58E+00 |
| | Climate Change (biogenic) [kg CO2 eq.] | -6.17E-01 | 2.84E-04 | 7.55E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.54E-07 | 1.21E-05 | 0 | 5.83E-02 | -1.27E-02 |
| | Climate Change (land use change) [kg CO2 eq.] | 1.30E-02 | 1.71E-03 | 2.67E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.66E-07 | 2.44E-05 | 0 | 4.32E-04 | 8.20E-03 |
|  | Ozone depletion [kg CFC-11 eq.] | 4.48E-06 | 1.02E-14 | 9.01E-08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.92E-11 | 1.48E-09 | 0 | 1.94E-13 | 2.15E-08 |
|  | Acidification terrestrial and freshwater [Mole of H+ eq.] | 1.75E-02 | 1.29E-04 | 4.45E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.72E-05 | 2.33E-04 | 0 | 5.11E-04 | 8.55E-03 |
|  | Eutrophication freshwater [kg P eq.] | 1.48E-04 | 4.33E-07 | 3.35E-06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6.72E-09 | 5.73E-07 | 0 | 1.64E-07 | 6.38E-05 |
| | Eutrophication marine [kg N eq.] | 5.24E-03 | 4.52E-05 | 1.33E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7.99E-06 | 7.81E-05 | 0 | 1.32E-04 | 2.19E-03 |
| | Eutrophication terrestrial [Mole of N eq.] | 4.53E-02 | 5.46E-04 | 1.22E-03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8.75E-05 | 8.54E-04 | 0 | 1.45E-03 | 2.12E-02 |
|  | Photochemical ozone formation - human health [kg NMVOC eq.] | 1.34E-02 | 1.21E-04 | 3.86E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.61E-05 | 3.65E-04 | 0 | 4.03E-04 | 5.62E-03 |
|  | Resource use, mineral and metals [kg Sb eq.] ¹ | 2.46E-04 | 8.64E-09 | 5.01E-06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6.81E-10 | 2.38E-07 | 0 | 4.66E-09 | 4.10E-04 |
| | Resource use, energy carriers [MJ] ¹ | 5.48E+01 | 1.33E+00 | 1.42E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.47E-02 | 1.05E+00 | 0 | 9.49E-01 | 1.92E+01 |
|  | Water deprivation potential [m³ world equiv.] ¹ | 1.82E+00 | 1.51E-03 | 4.60E-02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7.67E-05 | 6.16E-03 | 0 | 8.24E-03 | 3.05E-01 |









¹ The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Resources Use


| Resources Use 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 |
|  Use of renewable primary energy (PERE) [MJ] ² | 7.50E+01 | 1.12E-01 | 1.52E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.53E-04 | 1.78E-02 | 0 | 1.66E-01 | 1.78E+00 |
|  Primary energy resources used as raw materials (PERM) [MJ] ² | 8.33E+00 | 0.00E+00 | -7.33E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00E+00 | 0.00E+00 | 0 | 0.00E+00 | 0.00E+00 |
|  Total use of renewable primary energy resources (PERT) [MJ] ² | 8.33E+01 | 1.12E-01 | -5.82E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.53E-04 | 1.78E-02 | 0 | 1.66E-01 | 1.78E+00 |
|  Use of non-renewable primary energy (PENRE) [MJ] ² | 4.74E+01 | 1.33E+00 | 1.27E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.47E-02 | 1.05E+00 | 0 | 9.49E-01 | 2.11E+01 |
|  Non-renewable primary energy resources used as raw materials (PENRM) [MJ] ² | 8.44E+00 | 0.00E+00 | -1.73E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00E+00 | 0.00E+00 | 0 | 0.00E+00 | 0.00E+00 |
|  Total use of non-renewable primary energy resources (PENRT) [MJ] ² | 5.58E+01 | 1.33E+00 | -4.56E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.47E-02 | 1.05E+00 | 0 | 9.49E-01 | 2.11E+01 |
|  Use of secondary material (SM) [kg] | 3.25E+00 | 0.00E+00 | 6.51E-02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00E+00 | 0.00E+00 | 0 | 0.00E+00 | 0.00E+00 |
|  Use of renewable secondary fuels (RSF) [MJ] | 1.29E-28 | 0.00E+00 | 2.58E-30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00E+00 | 0.00E+00 | 0 | 0.00E+00 | 2.29E-28 |
|  Use of non-renewable secondary fuels (NRSF) [MJ] | 1.52E-27 | 0.00E+00 | 3.03E-29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00E+00 | 0.00E+00 | 0 | 0.00E+00 | 2.70E-27 |
|  Use of net fresh water (FW) [m3] | 5.29E-02 | 1.26E-04 | 1.28E-03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.79E-06 | 1.43E-04 | 0 | 2.52E-04 | 9.59E-03 |

² From EPD International Construction Product PCR 2.0.1 (Annex 3). Option B was retained to calculate the primary energy use indicators.


Waste Category & Output flows

| Waste Category & Output Flows | 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 |
|  Hazardous waste disposed (HWD) [kg] | 7.88E-02 | 4.29E-11 | 2.50E-03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.16E-05 | 1.02E-03 | 0.00E+00 | 2.36E-10 | 1.73E-02 |
|  Non-hazardous waste disposed (NHWD) [kg] | 2.22E+00 | 2.06E-04 | 1.72E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.67E-04 | 6.23E-02 | 0.00E+00 | 4.81E+00 | 1.27E+00 |
|  Radioactive waste disposed (RWD) [kg] | 3.50E-04 | 1.71E-06 | 7.86E-06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.74E-09 | 3.33E-07 | 0.00E+00 | 9.95E-06 | 4.00E-05 |
|  Components for re-use (CRU) [kg] | 0.00E+00 | 0.00E+00 | 4.45E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
|  Materials for Recycling (MFR) [kg] | 0.00E+00 | 0.00E+00 | 8.65E-02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
|  Material for Energy Recovery (MER) [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
|  Exported electrical energy (EEE) [MJ] | 0.00E+00 | 0.00E+00 | 9.00E-02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
|  Exported thermal energy (EET) [MJ] | 0.00E+00 | 0.00E+00 | 1.61E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

Additional environmental impact indicators

| | | PRODUCT STAGE | CONSTRUCTION STAGE | | USE STAGE | | | | | | | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE |
|---|-----------------------------------|---------------|--------------------|-----------------|-----------|----------------|-----------|----------------|------------------|-----------------------|--------------------------|--------------------------------|--------------|---------------------|-------------|--|
| Environmental indicators | | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Operational energy | B7 Operational water use | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | D Reuse, recovery, recycling |
|  | GWP-GHG [kg CO2 eq.] ³ | 3.57E+00 | 1.05E-01 | 1.17E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.89E-03 | 7.39E-02 | 0 | 7.23E-02 | 1.56E+00 |

Information on biogenic carbon content






| | | PRODUCT STAGE |
|---|---|---------------|
| Biogenic Carbon Content | | A1 / A2 / A3 |
|  | Biogenic carbon content in product [kg] | 0.016 |
|  | Biogenic carbon content in packaging [kg] | 0.21 |

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








The product contains biogenic carbon due to the binder used. Regarding packaging, biogenic carbon is quantified due to wooden pallets production.

³ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO2 is set to zero.











Alternative End of life scenarios

| Environmental indicators | | Scenario 100% Landfill | | | | | Scenario 100% Recycling | | | | |
|---|---|--------------------------------------|--------------|------------------------|-------------|---|--------------------------------------|--------------|------------------------|-------------|---|
| | | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE |
| | | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | |
|  | Climate Change total [kg CO2 eq.] | 1.91E-03 | 7.47E-02 | 0 | 1.31E-01 | 1.57E+00 | 1.91E-03 | 7.47E-02 | 2.19E-01 | 0 | 9.12E-01 |
| | Climate Change (fossil) [kg CO2 eq.] | 1.91E-03 | 7.47E-02 | 0 | 7.20E-02 | 1.58E+00 | 1.91E-03 | 7.47E-02 | 1.57E-01 | 0 | 9.31E-01 |
| | Climate Change (biogenic) [kg CO2 eq.] | 1.54E-07 | 1.21E-05 | 0 | 5.83E-02 | -1.27E-02 | 1.54E-07 | 1.21E-05 | 6.19E-02 | 0 | -1.42E-02 |
| | Climate Change (land use change) [kg CO2 eq.] | 1.66E-07 | 2.44E-05 | 0 | 4.32E-04 | 8.20E-03 | 1.66E-07 | 2.44E-05 | 2.36E-04 | 0 | -5.11E-03 |
|  | Ozone depletion [kg CFC-11 eq.] | 2.92E-11 | 1.48E-09 | 0 | 1.94E-13 | 2.15E-08 | 2.92E-11 | 1.48E-09 | 2.84E-09 | 0 | -1.93E-08 |
|  | Acidification terrestrial and freshwater [Mole of H+ eq.] | 1.72E-05 | 2.33E-04 | 0 | 5.11E-04 | 8.55E-03 | 1.72E-05 | 2.33E-04 | 1.06E-03 | 0 | -1.38E-03 |
|  | Eutrophication freshwater [kg P eq.] | 6.72E-09 | 5.73E-07 | 0 | 1.64E-07 | 6.38E-05 | 6.72E-09 | 5.73E-07 | 1.56E-06 | 0 | -3.06E-05 |
| | Eutrophication marine [kg N eq.] | 7.99E-06 | 7.81E-05 | 0 | 1.32E-04 | 2.19E-03 | 7.99E-06 | 7.81E-05 | 4.39E-04 | 0 | -2.51E-04 |
| | Eutrophication terrestrial [Mole of N eq.] | 8.75E-05 | 8.54E-04 | 0 | 1.45E-03 | 2.12E-02 | 8.75E-05 | 8.54E-04 | 4.79E-03 | 0 | -4.27E-04 |
|  | Photochemical ozone formation - human health [kg NMVOC eq.] | 2.61E-05 | 3.65E-04 | 0 | 4.03E-04 | 5.62E-03 | 2.61E-05 | 3.65E-04 | 1.53E-03 | 0 | -1.07E-03 |
|  | Resource use, mineral and metals [kg Sb eq.] ⁴ | 6.81E-10 | 2.38E-07 | 0 | 4.66E-09 | 4.10E-04 | 6.81E-10 | 2.38E-07 | 2.99E-07 | 0 | -2.64E-04 |
| | Resource use, energy carriers [MJ] ¹ | 2.47E-02 | 1.05E+00 | 0 | 9.49E-01 | 1.92E+01 | 2.47E-02 | 1.05E+00 | 2.49E+00 | 0 | 3.16E+00 |
|  | Water deprivation potential [m³ world equiv.] ¹ | 7.67E-05 | 6.16E-03 | 0 | 8.24E-03 | 3.05E-01 | 7.67E-05 | 6.16E-03 | 4.33E-02 | 0 | 2.35E-01 |











⁴ 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

| Environmental indicators | | Scenario 100% incineration with ER | | | | | Scenario 100% incineration w/o ER | | | | |
|---|--|--------------------------------------|-----------------|---------------------------|----------------|---|--------------------------------------|-----------------|---------------------------|----------------|---|
| | | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE |
| | | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | |
|  | Climate Change total [kg CO2 eq.] | 1.91E-03 | 1.21E-01 | 0 | 9.13E-01 | 1.57E+00 | 1.91E-03 | 1.21E-01 | 0.00E+00 | 9.13E-01 | 1.57E+00 |
| | Climate Change (fossil) [kg CO2 eq.] | 1.91E-03 | 1.21E-01 | 0 | 8.55E-01 | 1.58E+00 | 1.91E-03 | 1.21E-01 | 0.00E+00 | 8.55E-01 | 1.58E+00 |
| | Climate Change (biogenic) [kg CO2 eq.] | 1.54E-07 | 1.97E-05 | 0 | 5.81E-02 | -1.27E-02 | 1.54E-07 | 1.97E-05 | 0.00E+00 | 5.81E-02 | -1.27E-02 |
| | Climate Change (land use change) [kg CO2 eq.] | 1.66E-07 | 3.96E-05 | 0 | 2.38E-04 | 8.20E-03 | 1.66E-07 | 3.96E-05 | 0.00E+00 | 2.38E-04 | 8.20E-03 |
|  | Ozone depletion [kg CFC-11 eq.] | 2.92E-11 | 2.41E-09 | 0 | 2.32E-09 | 2.15E-08 | 2.92E-11 | 2.41E-09 | 0.00E+00 | 2.32E-09 | 2.15E-08 |
|  | Acidification terrestrial and freshwater [Mole of H+ eq.] | 1.72E-05 | 3.79E-04 | 0 | 1.92E-03 | 8.55E-03 | 1.72E-05 | 3.79E-04 | 0.00E+00 | 1.92E-03 | 8.55E-03 |
|  | Eutrophication freshwater [kg P eq.] | 6.72E-09 | 9.32E-07 | 0 | 1.65E-06 | 6.38E-05 | 6.72E-09 | 9.32E-07 | 0.00E+00 | 1.65E-06 | 6.38E-05 |
| | Eutrophication marine [kg N eq.] | 7.99E-06 | 1.27E-04 | 0 | 8.90E-04 | 2.19E-03 | 7.99E-06 | 1.27E-04 | 0.00E+00 | 8.90E-04 | 2.19E-03 |
| | Eutrophication terrestrial [Mole of N eq.] | 8.75E-05 | 1.39E-03 | 0 | 9.82E-03 | 2.12E-02 | 8.75E-05 | 1.39E-03 | 0.00E+00 | 9.82E-03 | 2.12E-02 |
|  | Photochemical ozone formation - human health [kg NMVOC eq.] | 2.61E-05 | 5.93E-04 | 0 | 2.58E-03 | 5.62E-03 | 2.61E-05 | 5.93E-04 | 0.00E+00 | 2.58E-03 | 5.62E-03 |
|  | Resource use, mineral and metals [kg Sb eq.] ⁵ | 6.81E-10 | 3.87E-07 | 0 | 3.49E-07 | 4.10E-04 | 6.81E-10 | 3.87E-07 | 0.00E+00 | 3.49E-07 | 4.10E-04 |
| | Resource use, energy carriers [MJ] ¹ | 2.47E-02 | 1.71E+00 | 0 | 2.48E+00 | 1.92E+01 | 2.47E-02 | 1.71E+00 | 0.00E+00 | 2.48E+00 | 1.92E+01 |
|  | Water deprivation potential [m³ world equiv.] ¹ | 7.67E-05 | 1.00E-02 | 0 | 1.42E-01 | 3.05E-01 | 7.67E-05 | 1.00E-02 | 0.00E+00 | 1.42E-01 | 3.05E-01 |









⁵ 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









| Resources Use indicators | | Scenario 100% Landfill | | | | | Scenario 100% recycling | | | | |
|---|--|-----------------------------------|--------------|---------------------|-------------|---|-----------------------------------|--------------|---------------------|-------------|---|
| | | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE |
| | | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | |
|  | Use of renewable primary energy (PERE) [MJ] ⁶ | 1.53E-04 | 1.78E-02 | 0 | 1.66E-01 | 1.78E+00 | 1.53E-04 | 1.78E-02 | 4.03E-02 | 0.00E+00 | 3.75E+00 |
|  | Primary energy resources used as raw materials (PERM) [MJ] ² | 0.00E+00 | 0.00E+00 | 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
|  | Total use of renewable primary energy resources (PERT) [MJ] ² | 1.53E-04 | 1.78E-02 | 0 | 1.66E-01 | 1.78E+00 | 1.53E-04 | 1.78E-02 | 4.03E-02 | 0.00E+00 | 3.75E+00 |
|  | Use of non-renewable primary energy (PENRE) [MJ] ² | 2.47E-02 | 1.05E+00 | 0 | 9.49E-01 | 2.11E+01 | 2.47E-02 | 1.05E+00 | 2.49E+00 | 0.00E+00 | 1.92E+00 |
|  | Non-renewable primary energy resources used as raw materials (PENRM) [MJ] ² | 0.00E+00 | 0.00E+00 | 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
|  | Total use of non-renewable primary energy resources (PENRT) [MJ] ² | 2.47E-02 | 1.05E+00 | 0 | 9.49E-01 | 2.11E+01 | 2.47E-02 | 1.05E+00 | 2.49E+00 | 0.00E+00 | 1.92E+00 |
|  | Use of secondary material (SM) [kg] | 0.00E+00 | 0.00E+00 | 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
|  | Use of renewable secondary fuels (RSF) [MJ] | 0.00E+00 | 0.00E+00 | 0 | 0.00E+00 | 2.29E-28 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -1.52E-28 |
|  | Use of non-renewable secondary fuels (NRSF) [MJ] | 0.00E+00 | 0.00E+00 | 0 | 0.00E+00 | 2.70E-27 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -1.78E-27 |
|  | Use of net fresh water (FW) [m3] | 1.79E-06 | 1.43E-04 | 0 | 2.52E-04 | 9.59E-03 | 1.79E-06 | 1.43E-04 | 1.01E-03 | 0.00E+00 | 4.62E-03 |

⁶ From EPD International Construction Product PCR 2.0.1 (Annex 3). Option B was retained to calculate the primary energy use indicators.

| Resources Use indicators | Scenario 100% incineration with ER | | | | | | Scenario 100% incineration w/o ER | | | | | |
|--|------------------------------------|--------------|---------------------|-------------|--|---|-----------------------------------|--------------|---------------------|-------------|--|---|
| | END OF LIFE STAGE | | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE | END OF LIFE STAGE | | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE |
| | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | | | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | | |
|  Use of renewable primary energy (PERE) [MJ] ⁷ | 1.53E-04 | 2.89E-02 | 0 | 9.33E-02 | | 1.78E+00 | 1.53E-04 | 2.89E-02 | 0.00E+00 | 9.33E-02 | | 1.78E+00 |
|  Primary energy resources used as raw materials (PERM) [MJ] ² | 0.00E+00 | 0.00E+00 | 0 | 0.00E+00 | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 0.00E+00 |
|  Total use of renewable primary energy resources (PERT) [MJ] ² | 1.53E-04 | 2.89E-02 | 0 | 9.33E-02 | | 1.78E+00 | 1.53E-04 | 2.89E-02 | 0.00E+00 | 9.33E-02 | | 1.78E+00 |
|  Use of non-renewable primary energy (PENRE) [MJ] ² | 2.47E-02 | 1.71E+00 | 0 | 2.48E+00 | | 2.11E+01 | 2.47E-02 | 1.71E+00 | 0.00E+00 | 2.48E+00 | | 2.11E+01 |
|  Non-renewable primary energy resources used as raw materials (PENRM) [MJ] ² | 0.00E+00 | 0.00E+00 | 0 | 0.00E+00 | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 0.00E+00 |
|  Total use of non-renewable primary energy resources (PENRT) [MJ] ² | 2.47E-02 | 1.71E+00 | 0 | 2.48E+00 | | 2.11E+01 | 2.47E-02 | 1.71E+00 | 0.00E+00 | 2.48E+00 | | 2.11E+01 |
|  Use of secondary material (SM) [kg] | 0.00E+00 | 0.00E+00 | 0 | 0.00E+00 | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 0.00E+00 |
|  Use of renewable secondary fuels (RSF) [MJ] | 0.00E+00 | 0.00E+00 | 0 | 0.00E+00 | | 2.29E-28 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 2.29E-28 |
|  Use of non-renewable secondary fuels (NRSF) [MJ] | 0.00E+00 | 0.00E+00 | 0 | 0.00E+00 | | 2.70E-27 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 2.70E-27 |
|  Use of net fresh water (FW) [m3] | 1.79E-06 | 2.33E-04 | 0 | 3.33E-03 | | 9.59E-03 | 1.79E-06 | 2.33E-04 | 0.00E+00 | 3.33E-03 | | 9.59E-03 |

⁷ From EPD International Construction Product PCR 2.0.1 (Annex 3). Option B was retained to calculate the primary energy use indicators.

| Waste Category & Output Flows | Scenario 100% landfill | | | | | Scenario 100% recycling | | | | |
|---|--------------------------------|--------------|---------------------|-------------|--|--------------------------------|--------------|---------------------|-------------|--|
| | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE |
| | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | D Reuse, recovery, recycling | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | D Reuse, recovery, recycling |
|  Hazardous waste disposed (HWD) [kg] | 2.16E-05 | 1.02E-03 | 0.00E+00 | 2.36E-10 | 1.73E-02 | 2.16E-05 | 1.02E-03 | 3.09E-03 | 0.00E+00 | 2.04E-04 |
|  Non-hazardous waste disposed (NHWD) [kg] | 1.67E-04 | 6.23E-02 | 0.00E+00 | 4.81E+00 | 1.27E+00 | 1.67E-04 | 6.23E-02 | 4.81E+00 | 0.00E+00 | 8.47E-02 |
|  Radioactive waste disposed (RWD) [kg] | 2.74E-09 | 3.33E-07 | 0.00E+00 | 9.95E-06 | 4.00E-05 | 2.74E-09 | 3.33E-07 | 6.19E-07 | 0.00E+00 | 4.76E-04 |
|  Components for re-use (CRU) [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
|  Materials for Recycling (MFR) [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.81E+00 | 0.00E+00 | 0.00E+00 |
|  Material for Energy Recovery (MER) [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
|  Exported electrical energy (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 |
|  Exported thermal energy (EET) [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 |

| Waste Category & Output Flows | Scenario 100% incineration with ER | | | | | Scenario 100% incineration w/o ER | | | | |
|---|------------------------------------|--------------|---------------------|-------------|--|-----------------------------------|--------------|---------------------|-------------|--|
| | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE |
| | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | D Reuse, recovery, recycling | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | D Reuse, recovery, recycling |
|  Hazardous waste disposed (HWD) [kg] | 2.16E-05 | 1.66E-03 | 0.00E+00 | 4.81E-03 | 1.73E-02 | 2.16E-05 | 1.66E-03 | 0.00E+00 | 4.81E-03 | 1.73E-02 |
|  Non-hazardous waste disposed (NHWD) [kg] | 1.67E-04 | 1.01E-01 | 0.00E+00 | 4.81E+00 | 1.27E+00 | 1.67E-04 | 1.01E-01 | 0.00E+00 | 4.81E+00 | 1.27E+00 |
|  Radioactive waste disposed (RWD) [kg] | 2.74E-09 | 5.42E-07 | 0.00E+00 | 9.63E-06 | 4.00E-05 | 2.74E-09 | 5.42E-07 | 0.00E+00 | 9.63E-06 | 4.00E-05 |
|  Components for re-use (CRU) [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
|  Materials for Recycling (MFR) [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 |
|  Material for Energy Recovery (MER) [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
|  Exported electrical energy (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 |
|  Exported thermal energy (EET) [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 |

Electricity information

The electricity used during the manufacturing (A3) is based on the following:

The factory uses electricity with Guarantee of Origin certificate (GO).

Hence, the electricity mix considered for the manufacturing of the studied product is modelled according to the electricity mix described in the Guarantee of Origin certificate. The amount of electricity purchased with GO covers 100% of the electricity consumption on the manufacturing site.

| TYPE OF INFORMATION | DESCRIPTION |
|---|---|
| Location | Representative of the Guarantee of Origin purchased by Saint-Gobain |
| Share of electricity covered by the Guarantee of Origin | 100% of the energy consumption is covered by the GO |
| Energy sources for electricity | Hydro 100% 2% transmission losses |
| Dataset version | Sphera CUP2024.2 |
| Source | Guarantee of Origin certificate: 2025-04-01 |
| GWP-GHG CO ₂ eq. | 0.006 kg of CO ₂ eq./kWh |

An EPD is valid for 5 years. Therefore, the GO will be prolonged continuously to be valid for the whole validity of the EPD. If not prolonged, the EPD will be updated.

Biogas information

The biogas used during the manufacturing (A3) is based on the following:

The raw materials used for biogas production vary throughout the year. None of the raw materials used for biogas production is a secondary fuel because the generic co-product allocation approach in module A1-3 is used as the allocation approach in the manufacturing process. For this reason, the energy resource use is reported in the LCA as a primary resource (and not secondary fuel). The allocation then needs to consider the very low value of the co-products used for the biogas as just a few percentages compared to the main products (no exact figures are available). Specific data for all those processes are not available (and not required by RED). The most representative LCA data applicable for this biogas production considers the EN 15804 economical allocation approach.

| TYPE OF INFORMATION | DESCRIPTION |
|---|---|
| Location | Representative of the Guarantee of Origin purchased by Saint-Gobain |
| Share of electricity covered by the Guarantee of Origin | 100% of the energy consumption is covered by the GO |
| Energy sources for biogas | Variety |
| Dataset version | Sphera CUP2024.2 |
| Source | Guarantee of Origin certificate: provided monthly |
| GWP-GHG CO ₂ eq. | 0.11 kg of CO ₂ eq./kWh |

An EPD is valid for 5 years. Therefore, the GO will be prolonged continuously to be valid for the whole validity of the EPD. If not prolonged, the EPD will be updated.

Additional environmental information:

Conversion to specific thicknesses

This EPD® is for a product with thickness 30mm. A multiplication factor can be applied to obtain the environmental performance the actual thickness. All the results of this EPD® refer to the reference thickness of 37 mm with a value of $R = 1 \text{ m}^2\text{K/W}$.

To obtain the environmental performance associated with every specific thickness, the results expressed in this EPD® must be multiplied by its corresponding multiplication factor. The calculation of the conversion factor is based on the thickness (and hence weight) of the product.

| | ISOVER ROBUST TERRACE TP |
|---|--------------------------|
| Thickness (mm) | 30 |
| Thermal resistance ($\text{m}^2\text{K/W}$) | 0.8 |
| Multiplication factor to mass (kg/DU) | 0.81 |

Other additional environmental information

No additional information displayed.

Additional social and economic information

No additional information displayed.

Version history

Version 1

Abbreviation

| | |
|------------------------------------|---|
| DU | Declared unit |
| EPD | Environmental Product Declaration |
| eq. | equivalents |
| FU | Functional unit |
| g | gram |
| GJ | Giga Joules (as Net Calorific Value) |
| kg | kilogram |
| kWh | kilowatt-hour |
| L | liter |
| LCA | Life Cycle Assessment |
| LCI | Life Cycle Inventory |
| LCIA | Life Cycle Impact Assessment |
| MJ | Mega Joules (as Net Calorific Value) |
| $\text{m}^2\cdot\text{K/W}$ | kilowatt per square meter |
| PCR | Product Category Rules |
| RSL | Reference Service Life (in years) |
| ton | metric ton |
| $\text{W}/(\text{m}\cdot\text{K})$ | Watts per meter-Kelvin |
| GWP | Global warming potential |
| GWP-GHG | Global warming potential - Greenhouse gas |

| | |
|------|--|
| GHG | Greenhouse gas |
| GO | Guaranty of origin |
| AIB | Association of issuing bodies |
| IOBC | Instantaneous Oxidation of Biogenic Carbon |
| EF | Environmental footprint |

References

- ISO 14040:2006 Environmental Management - Life Cycle Assessment - Principles and framework.
- ISO 14044:2006 Environmental Management - Life Cycle Assessment - Requirements and guidelines.
- ISO 14025:2006 Environmental labels and Declarations - Type III Environmental Declarations - Principles and procedures.
- EN 15804:2012+A2:2019/AC:2021 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
- EN 15941 Sustainability of construction works - Data quality for environmental assessment of products and construction work - Selection and use of data
- EPD International. General Program Instructions (GPI) for the International EPD® System (version 5.0.1) <http://www.environdec.com/>.
- European Chemical Agency, Candidate List of substances of very high concern for Authorization. <https://echa.europa.eu/candidate-list-table>.
- Product Environmental Footprint Category Rules (PEFCRs) for products in buildings (2019).
- The International EPD System PCR 2019:14 Construction products and Construction services. Version 2.0.1
- EN 16783 Thermal insulation products - Environmental Product Declarations (EPD) - Product Category Rules (PCR) complementary to EN 15804 for factory made and in-situ formed products
- Eurostat waste statistics. Denmark, 2022. https://ec.europa.eu/eurostat/databrowser/view/env_wasstr/default/table?lang=en&category=env.env_was.env_wasgt Accessed 2025-09-23
- Amy Stockwell, December 2025, Project report for the verification of the Environmental Product Declaration of Insulation Products made in Vamdrup Denmark