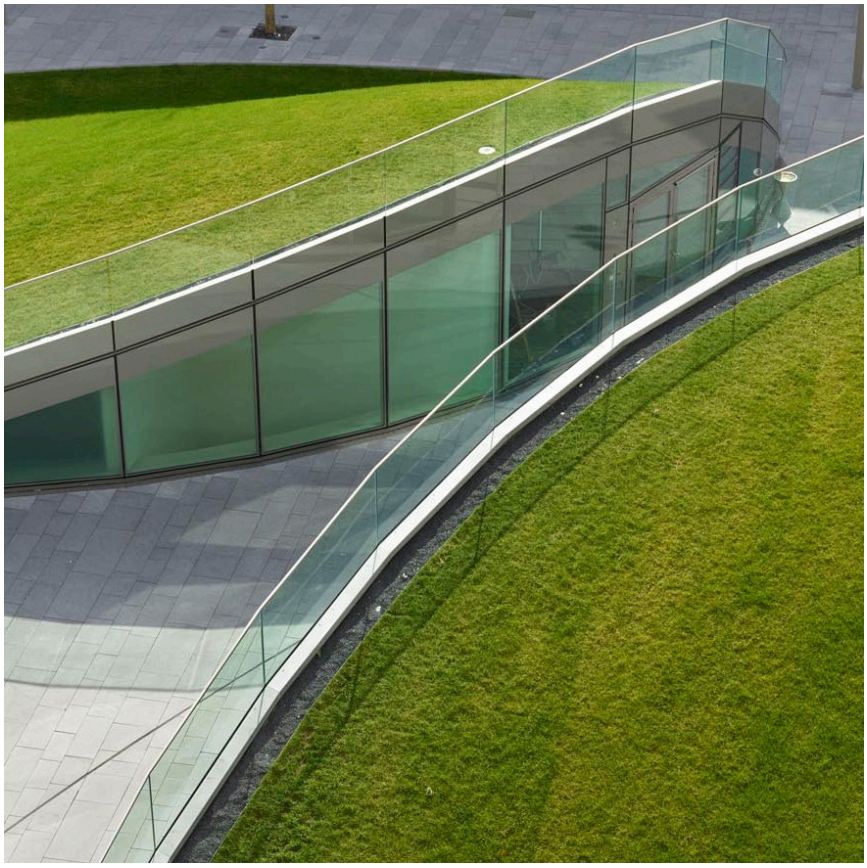
epd-global
Powered by EPD-Norway

# ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804+A2

## Optigrün international AG
## Pitched roof



OPTIGRÜN® DIE DACHBEGRÜNER

**Owner of the declaration**
Optigrün international AG
Am Birkenstock 15
72505 Krauchenwies
Germany

**Product**
Pitched roof

**Declared product / Functional unit**
1 m²

**This declaration is based on Product Category Rules**
EN 15804:2012 + A2:2019,
NPCR Part A:2021 ,
IBU PCR Part B: Requirements on the EPD for Green Roof Systems

**Program operator:**
EPD Global
Majorstuen P.O. Box 5250
N-0303 Oslo
Norway

**Declaration number**
NEPD-12386-12386-2

**Registration number**
NEPD-12386-12386-2

**Issue date**
07.10.2026

**Valid to**
06.10.2031

**EPD Software**
Emidat Platform v1.0.0

## General Information

**Product**
Pitched roof

**Program Operator**
EPD Global
Majorstuen P.O. Box 5250
N-0303 Oslo
Norway
Phone: +47 23 08 80 00
Email: post@epd-norge.no

**Declaration Number**
NEPD-12386-12386-2

**This declaration is based on Product Category Rules**
EN 15804:2012 + A2:2019,
NPCR Part A:2021 ,
IBU PCR Part B: Requirements on the EPD for Green Roof Systems

**Statements**
The owner of the declaration shall be liable for the underlying information and evidence. The Norwegian EPD Foundation shall not be liable with respect to manufacturer, life cycle assessment data and evidences.

**Functional unit**
1 $m^2$

**General information on verification of EPD from EPD tools**
Independent verification of data, other environmental information and the declaration according to ISO 14025:2011-10, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD Global's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD Global, and iii) the process is reviewed annually by an independent third-party verifier. See Appendix G of EPD Global's General Programme Instructions for further information on EPD tools.

**Verification**
Independent third-party verification based on the verification of the EPD tool, background data and test-EPD in accordance with EPD Global's procedures and guidelines for verification and approval of EPD tools.
Third-party verifier: Charlotte Merlin, FORCE Technology

**Owner of the declaration**
Optigrün international AG

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info@optigruen.de

**Manufacturer**
Optigrün international AG
Am Birkenstock 15
72505 Krauchenwies, Germany

**Place of production**
Krauchenwies, Germany

**Management system**
-

**Issue date**
07.10.2026

**Valid to**
06.10.2031

**Year of study**
2025

**Comparability**
EPDs of construction products may not be comparable if they do not comply with EN 15804 and are not seen in a building context. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database (including primary and secondary data).

**Development and verification of EPD**
The declaration was created using the Emidat EPD tool v1.0, developed by Emidat GmbH which is third-party verified and approved as a Reference Flow Tool with internal review under administration and surveillance by EPD Global under provisions stated in general information on verification of EPD from EPD tools.

Developer of EPD: Alexander Klefenz
Reviewer of company-specific input data and EPD: Pascal Keppler

**Approved**

Håkon Hauan, The Norwegian EPD Foundation

# Product

## Product description

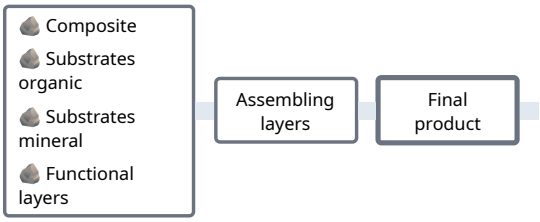
An extensive green roof system for pitched roofs with coordinated shear and erosion protection.

No packaging was included for the modeled product.

## Application description

The OPTIGRÜN Pitched Roof is an extensive green roof system for inclined roof surfaces. The build-up safely drains excess water and stabilises the substrate and vegetation through shear and erosion protection adapted to the roof pitch and rafter length. Depending on the design, the system supports moss-sedum or sedum-herb-grass vegetation and enables durable, continuous greening of pitched roofs.

## Production process




## Product specification

| Name of ingredient | Share of total weight |
|---|---|
| Composite | 0 - 2 % |
| Functional layers | 0 - 2 % |
| Substrates mineral | 70 - 90 % |
| Substrates organic | 2 - 10 % |

## Technical data

| | Unit | Value |
|---|---|---|
| Water storage capacity | Vol.-% | 50 |
| System sound absorption | dB | 0 |
| System height | mm | 100 |
| System weight saturated | kg / m² | 115 |
| System weight unsaturated (dry) | kg / m² | 70 |
| Water retention capacity | l / m² | 25 |
| pH value of the growing media (CaCl2) | - | 7.5 |
| Fire resistance class for growing media | - | A2 - s1, d0 |
| Salt content of the growing media | g / l | 0.7 |
| Runoff coefficient C | - | 0.65 |

## Market

Germany

## Recipients

B2B

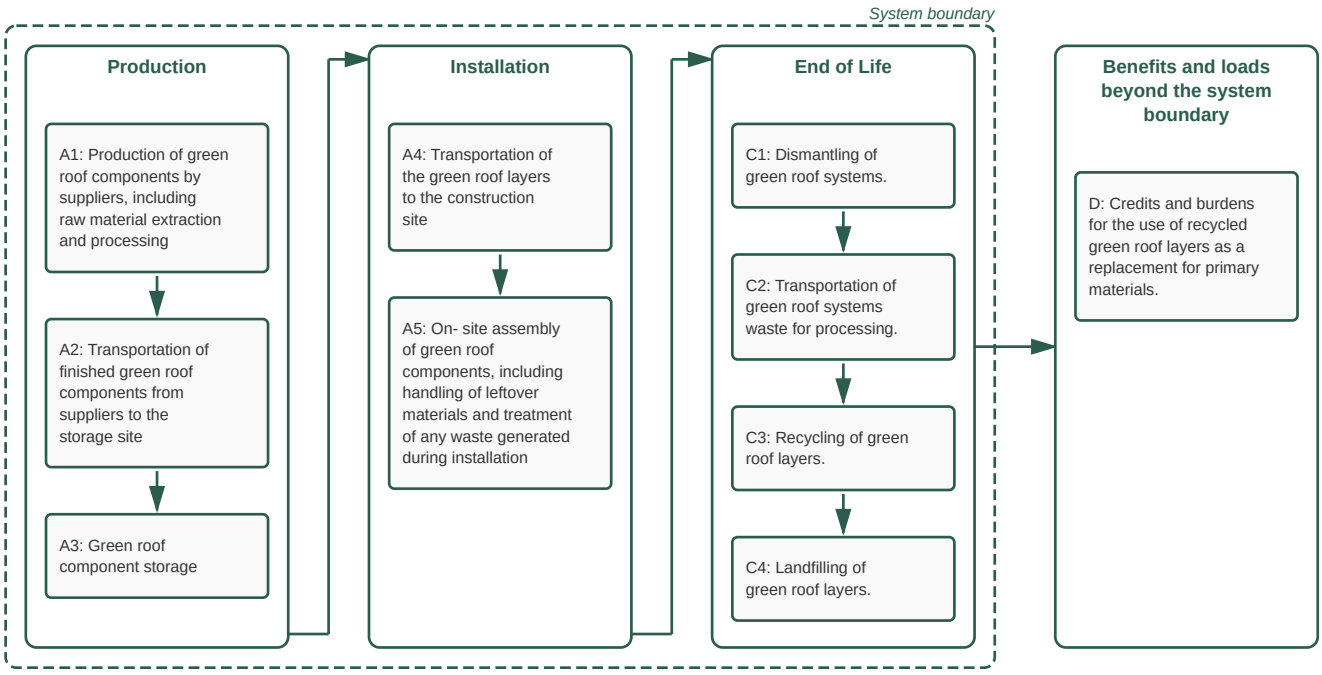
## LCA: Calculation rules

### Functional unit
1 m²

### Product lifetime
Not declared

### Reference service life
Not declared

### System boundary




### Data quality
The foreground data are based on extensive and detailed data collection at the production site of the manufacturer, covering key processes such as raw material sourcing, formulation, and manufacturing. These foreground data are fully linked with corresponding datasets from the background database (ecoinvent 3.10) or with EN15804+A2-compliant EPDs, ensuring consistency, reliability, and maintaining alignment with the latest industry standards.

The overall data representativeness is rated as fair with an overall score of 3.00/5, in accordance with EN 15804+A2 Annex E guidance on data quality assessment, considering geographical, technical, and temporal representativeness.

The following table discloses all processes or activities assessed with very poor or poor data representativeness according to EN 15804+A2, as well as those assessed as fair that contribute more than 30 % to any core impact indicator in A1–A3:

| Element | Minimal Representativeness | Source | Year |
|---|---|---|---|
| Composite | Poor | ecoinvent 3.10 | 2023 |
| Packaging | Poor | ecoinvent 3.10 | 2023 |
| Substrates mineral | Poor | ecoinvent 3.10 | 2023 |
| Substrates organic | Poor | ecoinvent 3.10 | 2023 |
| Packaging | Fair | ecoinvent 3.10 | 2023 |

### System boundaries (X=included, MND=module not declared)

| | Production | | | Installation | | Use stage | | | | | | | End-of-Life | | | | Next product system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Raw material supply | Transport | Manufacturing | Transport | Installation Process | Use | Maintenance | Repair | Replacement | Refurbishment | Operational Energy Use | Operational Water Use | Demolition | Transport | Waste Processing | Disposal | Benefits and loads beyond the system boundary |
| 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 | MND | MND | MND | MND | MND | MND | MND | x | x | x | x | x |
| Geography | | | DE | DE | DE | MND | MND | MND | MND | MND | MND | MND | DE | DE | DE | DE | DE |

For the geographies modeled in A1 and A2, refer to *Product specification*.

Type of EPD: Cradle to gate with options, modules A4, A5, C1-C4 + D

**Stage of Material Production and Construction**

Module A1: Production of green roof components by suppliers, including raw material extraction and processing

Module A2: Transportation of finished green roof components from suppliers to the storage site

Module A3: Green roof component storage

Module A4: Transportation of the green roof layers to the construction site

Module A5: On-site assembly of green roof components, including handling of leftover materials and treatment of any waste generated during installation

**Disposal Stage**

Module C1: Dismantling of green roof systems.

Module C2: Transportation of green roof systems waste for processing.

Module C3: Recycling of green roof layers.

Module C4: Landfilling of green roof layers.

**Credits and burdens outside the system boundaries**

Module D: Credits and burdens for the use of recycled green roof layers as a replacement for primary materials.

### Cut-off criteria

All inputs and outputs related to the declared modules of Green roof, including raw materials, packaging, transportation, energy usage and ancillary materials, were comprehensively considered in line with EN 15804+A2 and if applicable the product-specific PCR. Furthermore, all known hazardous substances (within the REACH list and the Norwegian Priority List), regulated materials, and significant emissions were declared and are not excluded under the cut-off rules.

The following processes are considered below the EN 15804+A2 cut-off threshold and were excluded:

- Impacts related to the manufacturer's infrastructure and assets
- Manufacturing of means of production, buildings or other capital goods
- Transportation of personnel to the plant
- Transportation of personnel within the plant
- Research and development activities
- Long-term emissions

### Allocation

Foreground inventory data (energy and fuels, ancillary materials, emissions and waste) was collected at the production process level. Allocation based on Area was applied to allocate the total output of the production process in 2025 to the reference product.

### Key assumptions and estimates

Production process flows are allocated to the reference product, as described under allocation. The Area-based allocation assumes a uniform distribution of production impacts across co-products. Foreground inventory data is checked for consistency of production process, to ensure the validity of the allocated results.

## LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD. Mass and energy flows are reported per 1 $m^2$ of product.

| Transport to the building site (A4) | Value | Unit |
|---|---|---|
| Location of the production site | Germany | |
| Location of the installation site | Germany | |
| Transported mass | 70.00 | kg |
| Transport modality: Truck | transport, freight, lorry >32 metric ton, EURO6 | - |
| Distance | 100.00 | km |
| Litres of fuel | 36.48 | l / 100km |
| Energy demand | 1.58 | MJ / t*km |
| Energy demand (km) | 0.11 | MJ / km |
| Capacity utilization | 53.30 | % |

Transport of the product and its packaging from the production site to the installation site. Transport distances are based on external sources such as reported market averages, standards or PCRs. Vehicle type, fuel consumption and capacity utilization assumptions stem from the underlying background transport datasets and are stated below.

| Installation into the building (A5) | Value | Unit |
|---|---|---|
| Ancillary materials for installation | 0 | kg |
| Water use during installation | 0 | $m^3$ |
| Use of other resources during installation | 0 | kg |
| Energy consumption during installation | | |
| Diesel consumption | 1.77 | l |
| Material waste on the construction site before waste processing | | |
| Installation loss | 6.00 | % |
| Installation loss | 4.20 | kg |
| Direct emissions to ambient air, soil and water | 0 | kg |
| Treatment of installation loss waste | | |
| Landfill | 100.00 | % |

Installation losses are accounted for by scaling up the quantity of product required at the construction site by the loss percentage. The production, transportation and treatment of the lost material is assigned to A5. Substrate is transported on top of the roof with vacuum. The installation of a green roof system involves preparing the roof surface with protective and waterproofing layers, then adding components that enable drainage, support plant growth, and sustain vegetation. The use of mechanized construction equipment during product installation is included as energy use under module A5.

| End-of-life scenario (C1-C4) | Value | Unit |
|---|---|---|
| Diesel consumption | 1.77 | l |
| Collection process specified by type | | |
| Collected individually | 0 | kg |

| End-of-life scenario (C1-C4) | Value | Unit |
|---|---|---|
| Collected with mixed construction and demolition waste | 70.00 | kg |
| Recovery system specified by type | | |
| Destined for reuse | 0 | kg |
| Destined for recycling | 0 | kg |
| Destined for energy recovery | 1.82 | kg |
| Disposal specified by type | | |
| Product or material destined for final disposal | 68.18 | kg |
| Transport | | |
| Distance to incineration | 50.00 | km |
| Distance to landfill | 50.00 | km |
| Transport modality: Truck | transport, freight, lorry >32 metric ton, EURO6 | - |
| Energy demand | 1.58 | MJ / t*km |
| Energy demand (km) | 0.11 | MJ / km |
| Capacity utilization | 53.30 | % |

Substrate layer is assumed to be vacuumed off the roof (Diesel consumption). All other system components are deconstructed manually (no loads). Module C2 includes the impact of transportation of material after deconstruction, during the End-of-Life stage.

| Reuse, recovery and/or recycling potentials (D) | Value | Unit |
|---|---|---|
| Amount of secondary material that the system takes in | 0.87 | kg |
| Installation (packaging): Net flow of secondary material | 0 | kg |
| End-of-life (product): Net flow of secondary material | 0 | kg |
| Installation (packaging): Material eligible for incineration credits | 0 | kg |
| Installation (packaging): Exported energy eligible for credits | 0 | MJ |
| Installation (production loss): Material eligible for incineration credits | 0 | kg |
| Installation (production loss): Exported energy eligible for credits | 0 | MJ |
| End-of-life (product): Material eligible for incineration credits | 1.80 | kg |
| End-of-life (product): Exported energy eligible for credits | 0.27 | MJ |
| Substitution of electricity production, grid mix | 0.08 | MJ |
| Substitution of heat production from natural gas | 0.19 | MJ |

Calculation of loads and benefits per EN 15804+A2. Exported energy is credited only where it originates from the incineration of primary material; landfilled fractions receive no exported-energy credit and therefore no avoided primary energy consumption. Recycling or reuse benefits are credited for the net flow of secondary material.

# LCA: Results

## Core environmental impact indicators

| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| GWP-total | kg $CO_2$-eq. | 6.63e+00 | 7.25e-01 | 7.16e+00 | 6.43e+00 | 3.63e-01 | 4.43e+00 | 4.31e+00 | -2.47e-02 |
| GWP-fossil | kg $CO_2$-eq. | 8.81e+00 | 7.25e-01 | 7.07e+00 | 6.43e+00 | 3.62e-01 | 4.33e+00 | 6.83e-01 | -2.37e-02 |
| GWP-biogenic | kg $CO_2$-eq. | -2.20e+00 | 3.64e-04 | 9.19e-02 | 6.42e-04 | 1.82e-04 | 9.67e-02 | 3.62e+00 | -9.87e-04 |
| GWP-luluc | kg $CO_2$-eq. | 1.52e-02 | 2.57e-04 | 1.50e-03 | 5.59e-04 | 1.29e-04 | 2.81e-05 | 1.66e-04 | -1.94e-05 |
| ODP | kg CFC-11-Eq | 5.70e-06 | 1.51e-08 | 4.43e-07 | 9.84e-08 | 7.55e-09 | 1.60e-09 | 2.14e-08 | -7.33e-10 |
| AP | mol H+-Eq | 4.28e-02 | 1.71e-03 | 6.12e-02 | 5.80e-02 | 8.56e-04 | 9.88e-04 | 7.53e-03 | -2.85e-05 |
| EP-freshwater | kg P-Eq | 2.37e-03 | 5.10e-05 | 4.05e-04 | 1.87e-04 | 2.55e-05 | 1.36e-05 | 1.15e-03 | -1.24e-05 |
| EP-marine | kg N-Eq | 8.76e-03 | 4.49e-04 | 2.76e-02 | 2.69e-02 | 2.25e-04 | 5.62e-04 | 1.88e-03 | -9.89e-06 |
| EP-terrestrial | mol N-Eq | 9.46e-02 | 4.86e-03 | 3.02e-01 | 2.95e-01 | 2.43e-03 | 4.79e-03 | 2.02e-02 | -8.13e-05 |
| POCP | kg NMVOC-Eq | 3.97e-02 | 2.97e-03 | 9.10e-02 | 8.79e-02 | 1.49e-03 | 1.20e-03 | 7.38e-03 | -3.99e-05 |
| ADPE | kg Sb-Eq | 7.23e-05 | 2.07e-06 | 6.91e-06 | 2.31e-06 | 1.04e-06 | 3.11e-07 | 1.34e-06 | -2.22e-08 |
| ADPF | MJ, net calorific value | 1.60e+02 | 1.09e+01 | 9.57e+01 | 8.41e+01 | 5.44e+00 | 8.46e-01 | 1.59e+01 | -3.77e-01 |
| WDP | $m^3$ world Eq deprived | 3.37e+00 | 5.47e-02 | 4.19e-01 | 2.06e-01 | 2.73e-02 | 2.85e-01 | 9.51e-02 | -2.12e-03 |

**GWP-total**: Global Warming Potential - total , **GWP-fossil**: Global warming potential - fossil , **GWP-biogenic**: Global Warming Potential - biogenic , **GWP-luluc**: Global Warming Potential - luluc , **ODP**: Depletion potential of the stratospheric ozone layer , **AP**: Acidification potential, Accumulated Exceedance , **EP-freshwater**: Eutrophication potential - freshwater , **EP-marine**: Eutrophication potential - marine , **EP-terrestrial**: Eutrophication potential - terrestrial , **POCP**: Photochemical Ozone Creation Potential , **ADPE**: Abiotic depletion potential - non-fossil resources , **ADPF**: Abiotic depletion potential - fossil resources , **WDP**: Water (user) deprivation potential

## Additional indicators

| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| PM | disease incidence | 6.47e-07 | 7.06e-08 | 1.70e-06 | 1.65e-06 | 3.53e-08 | 5.09e-09 | 1.15e-07 | -1.54e-10 |
| IRP | kBq U235-Eq | 6.85e-01 | 1.32e-02 | 8.12e-02 | 3.76e-02 | 6.61e-03 | 1.54e-03 | 2.13e-02 | -2.26e-03 |
| ETP-fw | CTUe | 3.81e+01 | 2.58e+00 | 1.52e+01 | 1.19e+01 | 1.29e+00 | 8.70e+00 | 1.17e+01 | -4.29e-02 |
| HTP-c | CTUh | 3.25e-08 | 4.64e-09 | 2.77e-08 | 2.51e-08 | 2.32e-09 | 9.94e-10 | 3.88e-09 | -3.83e-11 |
| HTP-nc | CTUh | 7.29e-08 | 7.18e-09 | 1.76e-08 | 1.14e-08 | 3.59e-09 | 1.30e-08 | 1.91e-08 | -8.19e-11 |
| SQP | dimensionless | 1.95e+02 | 1.09e+01 | 2.10e+01 | 5.89e+00 | 5.47e+00 | 2.38e-01 | 3.90e+01 | -2.65e-02 |

**PM**: Potential incidence of disease due to PM emissions , **IRP**: Potential Human exposure efficiency relative to U235 , **ETP-fw**: Potential Comparative Toxic Unit for ecosystems , **HTP-c**: Potential Comparative Toxic Unit for humans - cancer effects , **HTP-nc**: Potential Comparative Toxic Unit for humans - non-cancer effects , **SQP**: Potential Soil quality index . **IRP**: 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. **ETP-fw, HTP-c, HTP-nc, SQP**: 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 experienced with these indicators.

## Use of resources

| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| PERE | MJ | 2.10e+01 | 1.73e-01 | 1.81e+00 | 5.15e-01 | 8.63e-02 | 3.37e-02 | 3.30e-01 | -3.53e-02 |
| PERM | MJ | 1.01e+01 | 0.00e+00 | 6.06e-01 | 0.00e+00 | 0.00e+00 | -2.63e-01 | 0.00e+00 | 0.00e+00 |

## Use of resources

| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| PERT | MJ | 3.11e+01 | 1.73e-01 | 2.41e+00 | 5.15e-01 | 8.63e-02 | -2.29e-01 | 3.30e-01 | -3.53e-02 |
| PENRE | MJ | 1.08e+02 | 1.09e+01 | 9.26e+01 | 8.41e+01 | 5.44e+00 | 8.46e-01 | 1.59e+01 | -3.77e-01 |
| PENRM | MJ | 5.21e+01 | 0.00e+00 | 3.12e+00 | 0.00e+00 | 0.00e+00 | -1.35e+00 | 0.00e+00 | 0.00e+00 |
| PENRT | MJ | 1.61e+02 | 1.09e+01 | 9.57e+01 | 8.41e+01 | 5.44e+00 | -5.08e-01 | 1.59e+01 | -3.77e-01 |
| SM | kg | 8.70e-01 | 0.00e+00 | 5.22e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| RSF | 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 |
| NRSF | 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 |
| FW | $m^3$ | 9.55e-02 | 1.58e-03 | -4.85e-04 | 5.46e-03 | 7.91e-04 | 4.88e-03 | -1.92e-01 | -7.03e-05 |

**PERE**: Primary energy resources - renewable: use as energy carrier , **PERM**: Primary energy resources - renewable: used as raw materials , **PERT**: Primary energy resources - renewable: total , **PENRE**: Primary energy resources - non-renewable: use as energy carrier , **PENRM**: Primary energy resources - non-renewable: used as raw materials , **PENRT**: Primary energy resources - non-renewable: total , **SM**: Use of secondary material , **RSF**: Renewable secondary fuels , **NRSF**: Non-renewable secondary fuels , **FW**: Net use of fresh water

## Waste flows

| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| HWD | 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 |
| NHWD | kg | 0.00e+00 | 0.00e+00 | 4.20e+00 | 0.00e+00 | 0.00e+00 | 1.82e+00 | 6.82e+01 | 0.00e+00 |
| RWD | 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 |

**HWD**: Hazardous waste disposed , **NHWD**: Non hazardous waste disposed , **RWD**: Radioactive waste disposed

## Output flows

| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| 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 |
| 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 |
| 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 |
| EEE | MJ | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.87e-01 | 0.00e+00 | 0.00e+00 |
| EET | MJ | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.74e-01 | 0.00e+00 | 0.00e+00 |

**CRU**: Components for re-use , **MFR**: Materials for recycling , **MER**: Materials for energy recovery , **EEE**: Exported electrical energy , **EET**: Exported thermal energy

| Name | Value | Unit |
|---|---|---|
| Biogenic carbon content in product | 1.01e+00 | kg C |
| Biogenic carbon content in accompanying packaging | 0.00e+00 | kg C |

## Additional requirements

### Greenhouse gas emissions from the use of electricity in the manufacturing phase

None.

### Dangerous substances

The product contains no hazardous substances given by the REACH Candidate List or the Norwegian Priority List.

## Additional environmental information

### Secondary content

The product contains 1.23 % secondary material. Secondary material includes recycled, recovered and by-product content.

### Additional environmental impact indicators required in NPCR Part A for construction products

| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| GWP-IOBC | kg $CO_2$-eq. | 8.86e+00 | 7.25e-01 | 7.07e+00 | 6.43e+00 | 3.63e-01 | 4.33e+00 | 6.85e-01 | -2.38e-02 |

**GWP-IOBC**: Global Warming Potential - Instantaneous oxidation of biogenic carbon

## Bibliography


| | |
|---|---|
| CEN/TR 15941:2010 | Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data |
| EN 15804:2012+A2:2019 | Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products |
| EN 15942:2022-04 | Sustainability of construction works - Environmental product declarations - Communication format business-to-business |
| ISO 14025:2011-10 | Environmental labels and declarations - Type III environmental declarations - Principles and procedures |
| ISO 14040:2021-02 | Environmental management - Life cycle assessment - Principles and framework |
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