# ENVIRONMENTAL PRODUCT DECLARATION (EPD)

*In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019 for:*

**URSA WBW: PUREONE PURE FLOC, PURE FLOC, PUREONE PURE FLOC KD, PURE FLOC KD, WBWPF**

60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300, 320, 340, 360, 380, 400 mm

R= 1.75, 2.35, 2.90, 3.50, 4.10, 4.70, 5.25, 5.85, 6.45, 7.05, 7.65, 8.20, 8.80, 9.40, 10, 10.55, 11.15, 11.75 $m^2 \cdot K/W$

Owner: URSA INSULATION S.A

Programme: The International EPD® System, www.environdec.com

Programme operator: EPD International AB

EPD registration number: S-P-08576

Publication date: 03-03-2023

Valid until: 02-03-2028

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

# 1. General information

## 1.1. Programme information

**EPD Owner**: URSA Insulation. Paseo de Recoletos 3, 28004 Madrid (Spain)
**Programme used:** The International EPD® System. www.environdec.com
info@environdec.com
**EPD prepared by:** Silvia Herranz (URSA Insulation)
**Contact:** silvia.herranz@etexgroup.com
**Date of issue:** 03-03-2023 **Valid:** 02-03-2028

| | |
|---|---|
| **Programme:** | The International EPD® System |
| **Address:** | EPD International AB<br>Box 210 60<br>SE-100 31 Stockholm<br>Sweden |
| **Website:** | www.environdec.com |
| **E-mail:** | info@environdec.com |

| |
|---|
| CEN standard EN 15804+A2 serves as the Core Product Category Rules (PCR) |
| Product Category Rules (PCR): *PCR 2019:14. Construction products (EN 15804+A2) Version 1.11. C-PCR-005 Thermal insulation products (EN 16783:2017) Version: 2019-12-20* |
| PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members.<br>Review chair: Claudia A. Peña. The review panel may be contacted via the Secretariat info@environdec.com |
| Independent third-party verification of the declaration and data, according to ISO 14025:2006:<br><br>☐ EPD process certification ☒ EPD verification |
| Third-party verifier:<br>Marcel Gómez Ferrer, Marcel Gómez Consultoría Ambiental S.L<br>Email: info@marcelgomez.com<br><br>Approved by: The International EPD® System |
| Procedure for follow-up of data during EPD validity involves third party verifier:<br><br>☒ Yes ☐ No |

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

## 2. Company information

**Owner of the EPD**: URSA Insulation S.A.

**Contact:** Silvia Herranz (Sustainability & Technical Manager) (silvia.herranz@etexgroup.com)

**Description of the organization:**

URSA is a company dedicated to the manufacture and commercialization of thermal and acoustic insulation materials oriented towards sustainability and energy efficiency in building. URSA is one of the leading mineral wool and extruded polystyrene (XPS) manufacturers in Europe.

**Product-related or management system-related certifications:**

Desselgem plant is covered by EPD process certification system, are certified ISO 9001, ISO 14001.

**Name and location of production site(s):** Desselgem - Pitantiestraat 127, B-8792 Desselgem (Belgium)

## 3. Product information

This Environmental Product Declaration (EPD) describes the environmental impacts of 1m² glass wool insulation, thickness 60, 80, 100, 120, 140, 160, 180, 200, and 220, 240, 260, 280, 300, 320, 340, 360, 380, 400 mm and R-value 1.75, 2.35, 2.90, 3.50, 4.10, 4.70, 5.25, 5.85, and 6.45, 7.05, 7.65, 8.20 8.80, 9.40, 10, 10.55, 11.15, 11.75 $m^2 \cdot K/W$ respectively.

URSA manufactures glass wool using natural and plentiful raw materials (sand) or recycled materials (Cullet) in a fusion and fiber formation process. The products obtained are presented in the form of a "mineral wool mattress" composed of a flexible airy structure.

Thanks to their intertwined structure, mineral wools (glass wool or stone wool) are porous materials which trap air, thus providing an insulation solution. The porous and elastic structure of the mineral wool also absorbs aerial noise, impact sounds and enables acoustic correction inside buildings and premises. Finally, as they are based on naturally incombustible minerals, mineral wools are incombustible and do not propagate fire.

Insulation with mineral wool (glass wool) is used in buildings and in industrial installations. It ensures a high level of comfort, reduces energy costs, reduces carbon dioxide emissions ($CO_2$), prevents heat loss through sloping roofs, walls, ceilings, pipes, and boilers, reduces sound pollution and protects houses and industrial installations from risk of fire.

The service life of a glass wool product is like that of a building, as it is a component of that installation (often established at 50 years).

**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 pear)

**Geographical scope:** The product is manufactured in Belgium. The product is marketed mainly in Europe.

**Product name:** URSA WBW: PUREONE PURE FLOC, PURE FLOC, PUREONE PURE FLOC KD, PURE FLOC KD, WBWPF

**Product identification:** URSA PUREONE mineral wool panel in accordance with the EN 14064-1 standard, non-hydrophilic. Supplied in bulk.

**Functional unit:** *Thermal insulation over 1 m² of enclosure for the application of interior wall insulation that guarantees the following thermal resistance:*

| Thickness (mm) | R -Value (m²·K/W) |
|---|---|
| 60 | 1.75 |
| 80 | 2.35 |
| 100 | 2.90 |
| 120 | 3.50 |
| 140 | 4.10 |
| 160 | 4.70 |
| 180 | 5.25 |
| 200 | 5.85 |
| 220 | 6.45 |
| 240 | 7.05 |
| 260 | 7.65 |
| 280 | 8.20 |
| 300 | 8.80 |
| 320 | 9.40 |
| 340 | 10.00 |
| 360 | 10.55 |
| 380 | 11.15 |
| 400 | 11.75 |

## Technical data and physical characteristics*:*

| Parameters | Unit | Test method | Value | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Thickness** | mm | | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 240 | 260 | 280 | 300 | 320 | 340 | 360 | 380 | 400 |
| **R-value** | m²·K/W | | 1.75 | 2.35 | 2.90 | 3.50 | 4.10 | 4.70 | 5.25 | 5.85 | 6.45 | 7.05 | 7.65 | 8.20 | 8.80 | 9.40 | 10 | 10.55 | 11.15 | 11.75 |
| **Thermal Conductivity** | W/(m.K) | EN 12667 EN 12939 | 0.034 | | | | | | | | | | | | | | | | | |
| **Fire reaction** | Euroclase | EN 13501-1 | A1 | | | | | | | | | | | | | | | | | |
| **Air Flow resistivity** | | EN 29053 | AFr20 | | | | | | | | | | | | | | | | | |
| **Settlement** | | EN 15101-1 | S1 | | | | | | | | | | | | | | | | | |
| **Water vapour transmission (μ)** | | EN 12086 | MU1 | | | | | | | | | | | | | | | | | |
| **Short term water absorption** | kg/m² | EN 1609 | ≤ 1 | | | | | | | | | | | | | | | | | |
| **Long term water absorption** | kg/m² | EN 12087 | ≤ 3 | | | | | | | | | | | | | | | | | |
| **Reference standard to declare the efficacy of the product** | | | EN 14064-1 | | | | | | | | | | | | | | | | | |
| **Designation code CE** | | | MW EN 14064-1-A1-S1-WS-MU1 | | | | | | | | | | | | | | | | | |
| **Certificate** | | | CE EN 14064-1:2010; ETA 18/0889 | | | | | | | | | | | | | | | | | |
| **Application** | | | Thermal insulation in Building / thermal Insulation of interior walls. Timber/Cavity | | | | | | | | | | | | | | | | | |

## Description of the main components of the glass wool product:

| Product components | Weight, kg/m² | | | | | | | | | | | | | | | | | | Post-consumer material, weight - % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Thickness mm | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 240 | 260 | 280 | 300 | 320 | 340 | 360 | 380 | 400 | |
| Glass wool | 2.100 | 2.800 | 3.500 | 4.200 | 4.900 | 5.600 | 6.300 | 7.000 | 7.700 | 8.400 | 9.100 | 9.800 | 10.500 | 11.200 | 11.900 | 12.600 | 13.300 | 14.000 | 50% |

| Packaging components | weight, kg/m² | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Thickness mm | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 240 | 260 | 280 | 300 | 320 | 340 | 360 | 380 | 400 |
| Plastic Packaging | 0.007 | 0.009 | 0.012 | 0.014 | 0.016 | 0.019 | 0.021 | 0.024 | 0.026 | 0.029 | 0.031 | 0.034 | 0.036 | 0.039 | 0.041 | 0.044 | 0.047 | 0.049 |
| Wood Pallet | 0.065 | 0.086 | 0.108 | 0.130 | 0.151 | 0.173 | 0.195 | 0.216 | 0.238 | 0.259 | 0.281 | 0.303 | 0.324 | 0.346 | 0.368 | 0.389 | 0.411 | 0.432 |
| TOTAL | 0.072 | 0.096 | 0.120 | 0.144 | 0.168 | 0.192 | 0.216 | 0.240 | 0.264 | 0.288 | 0.312 | 0.336 | 0.361 | 0.385 | 0.409 | 0.433 | 0.457 | 0.482 |
| Weight-% (versus the product) | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% |

# 4. LCA Information

**Functional unit / declared unit:** It performs the function of thermal isolation on 1 m2 de wall ensuring thermal resistance of 1.75, 2.35, 2.90, 3.50, 4.10, 4.70, 5.25, 5.85, 6.45, 7.05, 7.65, 8.20, 8.80, 9.40, 10, 10.55, 11.15 and 11.75 $m^2 \cdot K/W$ for application Insulation (Glass wool 2.100-14.000 $kg/m^2$) of interior walls.

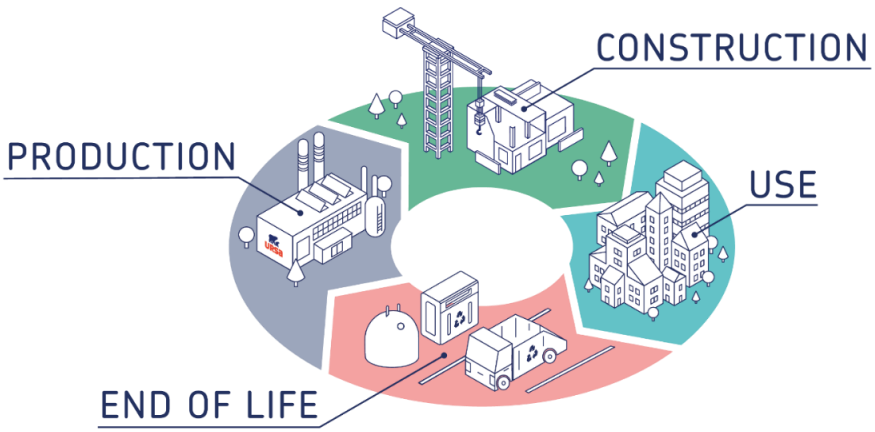
**Reference service life:** 50 years

**Time representativeness:** Plant production data for the complete year 2020.

**Database(s) and LCA software used**: ECOINVENT 3.6, EuGeos' 15804+A2_IA v4.1, OPENLCA 1.10.3 (2020)

**Description of system boundaries:**

Cradle to grave and module D (A + B + C + D)




**Main hypotheses and considerations:**

The polluter pays principle, the principle of modularity, and study exclusions (long-term emissions, infrastructure processes, and staff travel) have been considered.

**Cutt-off rules:**

In the case that there is not enough information, the process energy and materials representing less than 1% of the whole energy and mass used can be excluded (if they do not cause significant impacts). The addition of all the inputs and outputs excluded cannot be bigger than the 5% of the whole mass and energy used, as well of the emissions to environment occurred

**Description of the data quality used:**

All the raw materials for the manufacture of the declared product, the necessary energy, the water, the consumption, and the resulting emissions are considered in the life cycle analysis of this material. The production data of the Desselgem factory, for the full year 2020, have been used. The allocations of consumption, emissions and raw materials have been made based on physical criteria of the mass of glass.

The Ecoinvent 3.6 and EuGeos' 15804+A2_IA v4.1 databases have been used to choose the most representative processes, considering that the data is representative of technological development, regionalized data and as current as possible. These data have been treated in the OpenLCA 1.10.3 software for LCA modeling and the calculation of environmental impact categories, complying with the quality requirements established in the RCP.

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation:

**Phases and modules of life cycle taken into account**

| | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Module | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Module declared | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Geography | Belgium | Belgium | Global | Global | Global | Global | Global | Global | Global | Global | Global | Global | Global | Global | Global |
| Specific data used | >90% GWP | >90% GWP | >90% GWP | | | | | | | | | | | | |
| Variation - Products | No variability | No variability | No variability | | | | | | | | | | | | |
| Variation - Sites | Only plant | Only plant | Only plant | | | | | | | | | | | | |

## A1-A3 Production phase

**Description of the phase:**

The production phase of mineral wool products is divided into three modules: A1, supply of raw materials; A2, transport and A3, manufacture.

The addition of modules A1, A2 et A3 is an option provided by standard EN 15804+A2 and has been applied to this EPD.

### A1 Supply of raw materials

This module considers the supply and processing of all raw materials and the energies they produce prior to the manufacturing process. In particular, it covers supply of raw materials for manufacturing the binding and glass fibers, such as sand. In addition to these raw materials, recycled materials (cullet) are used in the process.

### A2 Transport to manufacturer

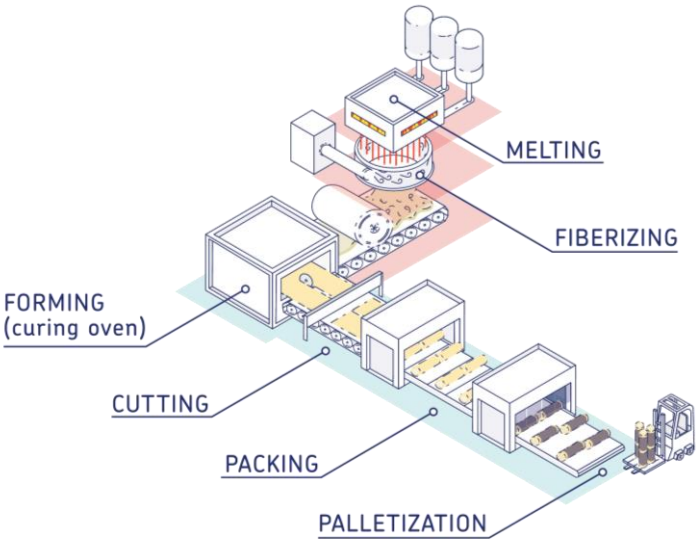
Raw materials are transported to the manufacturing site. The modelling includes road, river or rail transport (average values) for each of the raw materials.

### A3 Manufacturing

Glass wool manufacture includes stages of fusion and fibre formation (see diagram of manufacturing process). Furthermore, production of packaging is considered during this phase.

A certified 100% renewable mix has been used.

System Diagram:




## A4-A5 Construction phase

**Description:**

The construction phase is divided into two modules: A4, transport to the construction site and A5, installation in the building.

Description of the scenarios and supplementary technical information.

### A4 Transporte hasta la obra:

This module includes transport from factory to site. Average value.

The transport is calculated based on a scenario that includes the following parameters:

| Parameter | Value |
|---|---|
| Type of fuel and consumption of the vehicle or type of vehicle used for the transport for example, long distance lorry, boat, etc. | The vehicle runs on diesel, its emission standard is classified as EURO5 and it falls under the truck size class of 7.5 to 16 metric tons |
| Average distance to site | Lorry: 460 km |
| Use of capacity (including returning empty) | 100 % volume capacity |
| Terra<br>ç | 308.29-46.24 m² per pallet and 22 pallets per lorry<br>Density of product = 30 kg/m³ |
| Coefficient of use of volume capacity | >1 (products compressed in the packaging) |

### A5 Installation in the building:

This module includes the waste products created during mechanical installation of the mineral wool in the building, supplementary production required to compensate losses and treatment of site waste. The scenarios used for the quantity of waste generated during the installation and the treatment of the site waste are as follows:

| Parameter | Value |
|---|---|
| Ancillary inputs for installation (specified by material) | No ancillary inputs |
| Use of water | No water used |
| Use of other resources | No other resources |
| Quantitative description of the type of energy (regional mix) and consumption during the installation process | Electricity |
| Waste produced on the construction site prior to waste treatment generated by installation of the product (specified by type) | 2 % of glass wool |
| Materials (specified by type) produced by waste treatment on the construction site, for example collection with a view to recycling, recovery of energy, disposal (specified by channel) | All glass wool waste, its packaging and waste deriving from excess production for installation are considered as disposed of in landfill 114-762 gr/UF |
| Transport to landfill | 15 km |
| Direct emissions to atmosphere, soil and water | No emissions to be considered |

## B1-B7 Phase of use or exploitation (Excluding potential savings)

Phase of use is divided into seven modules:

- B1: Use or application of product installed
- B2: Maintenance
- B3: Repair
- B4: Replacement
- B5: Refurbishment
- B6: Energy needs during exploitation phase

- B7: Water needs during exploitation phase

Description of the scenarios and supplementary technical information.

No technical operation is required during the useful phase until the end of service life. Thus mineral wools do not have any impact during this phase but they permit potential energy savings.

### C1-C4 End of life phase

**Description:**

This phase includes the different modules of the end of service life as follows: C1, deconstruction, demolition; C2, transport to waste treatment; C3, waste treatment with a view to their reuse, recovery and/or recycling; C4, disposal.

Description of the scenarios and supplementary technical information.

**C1 Deconstruction, demolition:**

Deconstruction and /or dismantling of the insulation products is part of the demolition work of an entire building. In our case the environmental impact is considered to be very slight and can be ignored.

**C2 Transport to waste treatment site:**

The use of the model for transport is considered (see A4, transport to the construction site) at a distance of 15 km.

**C3 Waste treatment with a view to reuse, recovery, and/or recycling:**

The product is considered for landfill without reuse, recovery and/or recycling.

**C4 Disposal:**

Glass wool should be installed in a storage facility for non-inert and non-hazardous waste

| Parameter | Value |
|---|---|
| Collection procedure specified by type | 2.100-14.000 kg of glass wool (collected with mixed construction waste) |
| Recovery system specified by type | No reuse, no recycling, no energy recovery |
| Disposal specified by type | 2.100-14.000 kg of glass wool kept in storage facility for non -inert and non-hazardous waste |
| Hypotheses for creating scenarios (for example transport) | 100% Landfill |

## D Benefit and charge (refer to standard)

There are no recycling benefits since 100% of the weight of the product and its packaging is considered landfilled.

# 5. Content information

For the functional unit "1m² of glass wool insulation with a thickness of 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300, 320, 340, 360, 380 and 400 mm and thermal resistance of 1.75, 2.35, 2.90, 3.50, 4.10, 4.70, 5.25, 5.85, 6.45, 7.05, 7.65, 8.20, 8.80, 9.40, 10, 10.55, 11.15 and 11.75 $m^2 \cdot K/W$ respectively".

Estimated impact results are only relative statements that do not indicate impact category endpoints, exceeding threshold values, safety margins, or risks.

Results for 1m² of glass wool insulation with a thickness of 60 mm and thermal resistance of 1.75 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

**Results per functional or declared unit**

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-fossil | kg $CO_2$ eq. | 1.27E+00 | 2.07E-01 | 1.97E-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 | 5.19E-03 | 0.00E+00 | 1.11E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -1.06E-01 | 4.24E-04 | -1.57E-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 | 9.18E-06 | 0.00E+00 | 3.16E-05 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 1.32E-03 | 9.72E-05 | 2.09E-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 | 2.06E-06 | 0.00E+00 | 1.02E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 1.17E+00 | 2.08E-01 | 1.82E-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 | 5.20E-03 | 0.00E+00 | 1.11E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 2.11E-07 | 4.65E-08 | 3.27E-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 | 1.21E-09 | 0.00E+00 | 4.47E-09 | 0.00E+00 |
| AP | mol $H^+$ eq. | 6.55E-03 | 8.22E-04 | 1.03E-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 | 2.63E-05 | 0.00E+00 | 1.04E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 1.42E-03 | 4.80E-05 | 2.26E-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 | 1.04E-06 | 0.00E+00 | 3.13E-06 | 0.00E+00 |
| EP-freshwater | kg P eq. | 4.62E-04 | 1.56E-05 | 7.37E-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 | 3.39E-07 | 0.00E+00 | 1.02E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 1.37E-03 | 2.40E-04 | 2.16E-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 | 9.06E-06 | 0.00E+00 | 3.62E-05 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 1.60E-02 | 2.62E-03 | 2.50E-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 | 9.90E-05 | 0.00E+00 | 3.96E-04 | 0.00E+00 |
| POCP | kg NMVOC eq. | 4.48E-03 | 7.86E-04 | 7.03E-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 | 2.78E-05 | 0.00E+00 | 1.12E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 2.52E-04 | 9.06E-07 | 3.79E-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 | 1.75E-08 | 0.00E+00 | 2.38E-08 | 0.00E+00 |
| ADP-fossil* | MJ | 9.39E+00 | 2.66E-01 | 1.46E+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 | 5.95E-03 | 0.00E+00 | 2.31E-02 | 0.00E+00 |
| WDP* | $m^3$ | 1.41E+00 | 1.68E-02 | 2.17E-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 | 3.79E-04 | 0.00E+00 | 1.42E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[1] | kg $CO_2$ eq. | 1.24E+00 | 2.05E-01 | 1.92E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.14E-03 | 0.00E+00 | 1.09E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 8.59E-01 | 3.89E-02 | 1.45E-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 | 8.39E-04 | 0.00E+00 | 1.79E-03 | 0.00E+00 |
| PERM | MJ | 2.09E+00 | 1.32E-02 | 3.15E-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 | 2.75E-04 | 0.00E+00 | 8.45E-04 | 0.00E+00 |
| PERT | MJ | 2.94E+00 | 5.21E-02 | 4.60E-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 | 1.11E-03 | 0.00E+00 | 2.63E-03 | 0.00E+00 |
| PENRE | MJ | 1.18E+01 | 3.44E-01 | 1.86E+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 | 7.60E-03 | 0.00E+00 | 2.62E-02 | 0.00E+00 |
| PENRM | MJ. | 1.74E+01 | 2.78E+00 | 2.68E+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 | 7.20E-02 | 0.00E+00 | 2.84E-01 | 0.00E+00 |
| PENRT | MJ | 2.92E+01 | 3.12E+00 | 4.54E+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 | 7.96E-02 | 0.00E+00 | 3.11E-01 | 0.00E+00 |
| SM | kg | 1.37E+00 | 3.80E-03 | 2.06E-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 | 7.99E-05 | 0.00E+00 | 1.67E-04 | 0.00E+00 |
| RSF | MJ | 1.92E-02 | 1.16E-03 | 3.50E-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 | 2.38E-05 | 0.00E+00 | 2.93E-05 | 0.00E+00 |
| NRSF | MJ | 2.50E-02 | 5.03E-03 | 4.20E-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 | 9.65E-05 | 0.00E+00 | 4.23E-05 | 0.00E+00 |
| FW | $m^3$ | 3.30E-02 | 3.99E-04 | 5.08E-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 | 9.02E-06 | 0.00E+00 | 3.33E-04 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 8.05E-01 | 8.14E-02 | 1.43E-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 | 1.75E-03 | 0.00E+00 | 5.10E-03 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 8.46E-01 | 1.29E-01 | 4.43E-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 | 4.04E-03 | 0.00E+00 | 2.10E+00 | 0.00E+00 |
| Radioactive waste disposed | kg | 8.32E-04 | 6.91E-05 | 1.51E-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 | 1.57E-06 | 0.00E+00 | 3.91E-06 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 3.52E-02 | 3.21E-03 | 6.34E-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 | 6.64E-05 | 0.00E+00 | 1.06E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 2.78E-03 | 8.40E-04 | 4.34E-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 | 1.83E-05 | 0.00E+00 | 5.87E-05 | 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, thermal | 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 |

# Information on biogenic carbon content

### Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.119 |

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

Results for 1m² of glass wool insulation with a thickness of 80 mm and thermal resistance of 2.35 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | D Benefits and loads beyond the limits of the system |
| GWP-fossil | kg $CO_2$ eq. | 1.58E+00 | 2.76E-01 | 2.46E-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 | 6.92E-03 | 0.00E+00 | 1.47E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -1.42E-01 | 5.66E-04 | -2.11E-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 | 1.22E-05 | 0.00E+00 | 4.22E-05 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 1.70E-03 | 1.30E-04 | 2.70E-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-06 | 0.00E+00 | 1.36E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 1.44E+00 | 2.77E-01 | 2.25E-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 | 6.93E-03 | 0.00E+00 | 1.48E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 2.55E-07 | 6.21E-08 | 3.96E-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 | 1.61E-09 | 0.00E+00 | 5.96E-09 | 0.00E+00 |
| AP | mol $H^+$ eq. | 8.26E-03 | 1.10E-03 | 1.30E-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 | 3.50E-05 | 0.00E+00 | 1.39E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 1.86E-03 | 6.40E-05 | 2.97E-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 | 1.39E-06 | 0.00E+00 | 4.18E-06 | 0.00E+00 |
| EP-freshwater | kg P eq. | 6.07E-04 | 2.09E-05 | 9.69E-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 | 4.53E-07 | 0.00E+00 | 1.36E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 1.68E-03 | 3.20E-04 | 2.66E-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 | 1.21E-05 | 0.00E+00 | 4.82E-05 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 1.97E-02 | 3.49E-03 | 3.11E-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 | 1.32E-04 | 0.00E+00 | 5.28E-04 | 0.00E+00 |
| POCP | kg NMVOC eq. | 5.51E-03 | 1.05E-03 | 8.67E-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 | 3.70E-05 | 0.00E+00 | 1.50E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 3.36E-04 | 1.21E-06 | 5.04E-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 | 2.33E-08 | 0.00E+00 | 3.17E-08 | 0.00E+00 |
| ADP-fossil* | MJ | 1.24E+01 | 3.55E-01 | 1.92E+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 | 7.93E-03 | 0.00E+00 | 3.08E-02 | 0.00E+00 |
| WDP* | $m^3$ | 1.87E+00 | 2.24E-02 | 2.88E-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 | 5.05E-04 | 0.00E+00 | 1.90E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[2] | kg $CO_2$ eq. | 1.54E+00 | 2.74E-01 | 2.39E-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 | 6.86E-03 | 0.00E+00 | 1.45E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 1.12E+00 | 5.19E-02 | 1.89E-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 | 1.12E-03 | 0.00E+00 | 2.38E-03 | 0.00E+00 |
| PERM | MJ | 2.77E+00 | 1.76E-02 | 4.19E-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 | 3.67E-04 | 0.00E+00 | 1.13E-03 | 0.00E+00 |
| PERT | MJ | 3.89E+00 | 6.95E-02 | 6.08E-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 | 1.49E-03 | 0.00E+00 | 3.51E-03 | 0.00E+00 |
| PENRE | MJ | 1.55E+01 | 4.58E-01 | 2.45E+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 | 1.01E-02 | 0.00E+00 | 3.50E-02 | 0.00E+00 |
| PENRM | MJ. | 2.16E+01 | 3.71E+00 | 3.34E+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 | 9.59E-02 | 0.00E+00 | 3.79E-01 | 0.00E+00 |
| PENRT | MJ | 3.71E+01 | 4.16E+00 | 5.79E+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 | 1.06E-01 | 0.00E+00 | 4.14E-01 | 0.00E+00 |
| SM | kg | 1.82E+00 | 5.06E-03 | 2.74E-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 | 1.07E-04 | 0.00E+00 | 2.22E-04 | 0.00E+00 |
| RSF | MJ | 2.49E-02 | 1.54E-03 | 4.58E-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 | 3.17E-05 | 0.00E+00 | 3.91E-05 | 0.00E+00 |
| NRSF | MJ | 3.00E-02 | 6.71E-03 | 5.10E-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 | 1.29E-04 | 0.00E+00 | 5.64E-05 | 0.00E+00 |
| FW | $m^3$ | 4.38E-02 | 5.32E-04 | 6.74E-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 | 1.20E-05 | 0.00E+00 | 4.44E-04 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 1.03E+00 | 1.08E-01 | 1.83E-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 | 2.33E-03 | 0.00E+00 | 6.80E-03 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 8.57E-01 | 1.73E-01 | 5.50E-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 | 5.38E-03 | 0.00E+00 | 2.80E+00 | 0.00E+00 |
| Radioactive waste disposed | kg | 1.07E-03 | 9.22E-05 | 1.96E-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 | 2.10E-06 | 0.00E+00 | 5.21E-06 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 4.51E-02 | 4.29E-03 | 8.18E-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 | 8.85E-05 | 0.00E+00 | 1.41E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 3.20E-03 | 1.12E-03 | 5.03E-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 | 2.44E-05 | 0.00E+00 | 7.83E-05 | 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, thermal | 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 |

# Information on biogenic carbon content

### Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.159 |

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

Results for 1m² of glass wool insulation with a thickness of 100 mm and thermal resistance of 2.90 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | D Benefits and loads beyond the limits of the system |
| GWP-fossil | kg $CO_2$ eq. | 1.89E+00 | 3.45E-01 | 2.94E-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 | 8.65E-03 | 0.00E+00 | 1.84E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -1.78E-01 | 7.07E-04 | -2.65E-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 | 1.53E-05 | 0.00E+00 | 5.28E-05 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 2.08E-03 | 1.62E-04 | 3.31E-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 | 3.43E-06 | 0.00E+00 | 1.70E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 1.71E+00 | 3.46E-01 | 2.68E-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 | 8.67E-03 | 0.00E+00 | 1.85E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 2.98E-07 | 7.76E-08 | 4.65E-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 | 2.02E-09 | 0.00E+00 | 7.46E-09 | 0.00E+00 |
| AP | mol $H^+$ eq. | 9.96E-03 | 1.37E-03 | 1.57E-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 | 4.38E-05 | 0.00E+00 | 1.73E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 2.31E-03 | 8.00E-05 | 3.69E-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 | 1.74E-06 | 0.00E+00 | 5.22E-06 | 0.00E+00 |
| EP-freshwater | kg P eq. | 7.52E-04 | 2.61E-05 | 1.20E-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 | 5.66E-07 | 0.00E+00 | 1.70E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 2.00E-03 | 4.00E-04 | 3.17E-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 | 1.51E-05 | 0.00E+00 | 6.03E-05 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 2.35E-02 | 4.36E-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 | 1.65E-04 | 0.00E+00 | 6.60E-04 | 0.00E+00 |
| POCP | kg NMVOC eq. | 6.54E-03 | 1.31E-03 | 1.03E-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 | 4.63E-05 | 0.00E+00 | 1.87E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 4.19E-04 | 1.51E-06 | 6.30E-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 | 2.91E-08 | 0.00E+00 | 3.97E-08 | 0.00E+00 |
| ADP-fossil* | MJ | 1.54E+01 | 4.43E-01 | 2.38E+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 | 9.92E-03 | 0.00E+00 | 3.86E-02 | 0.00E+00 |
| WDP* | $m^3$ | 2.34E+00 | 2.80E-02 | 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 | 6.31E-04 | 0.00E+00 | 2.37E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[3] | kg $CO_2$ eq. | 1.84E+00 | 3.42E-01 | 2.86E-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 | 8.57E-03 | 0.00E+00 | 1.81E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 1.39E+00 | 6.48E-02 | 2.34E-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 | 1.40E-03 | 0.00E+00 | 2.98E-03 | 0.00E+00 |
| PERM | MJ | 3.46E+00 | 2.20E-02 | 5.23E-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 | 4.59E-04 | 0.00E+00 | 1.41E-03 | 0.00E+00 |
| PERT | MJ | 4.85E+00 | 8.69E-02 | 7.58E-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 | 1.86E-03 | 0.00E+00 | 4.39E-03 | 0.00E+00 |
| PENRE | MJ | 1.93E+01 | 5.73E-01 | 3.04E+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 | 1.27E-02 | 0.00E+00 | 4.37E-02 | 0.00E+00 |
| PENRM | MJ. | 2.58E+01 | 4.63E+00 | 4.00E+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 | 1.20E-01 | 0.00E+00 | 4.74E-01 | 0.00E+00 |
| PENRT | MJ | 4.51E+01 | 5.20E+00 | 7.03E+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 | 1.33E-01 | 0.00E+00 | 5.18E-01 | 0.00E+00 |
| SM | kg | 2.27E+00 | 6.33E-03 | 3.43E-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 | 1.33E-04 | 0.00E+00 | 2.78E-04 | 0.00E+00 |
| RSF | MJ | 3.06E-02 | 1.93E-03 | 5.65E-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 | 3.97E-05 | 0.00E+00 | 4.89E-05 | 0.00E+00 |
| NRSF | MJ | 3.51E-02 | 8.38E-03 | 6.01E-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 | 1.61E-04 | 0.00E+00 | 7.05E-05 | 0.00E+00 |
| FW | $m^3$ | 5.46E-02 | 6.65E-04 | 8.40E-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 | 1.50E-05 | 0.00E+00 | 5.55E-04 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 1.25E+00 | 1.36E-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 | 2.92E-03 | 0.00E+00 | 8.50E-03 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 8.67E-01 | 2.16E-01 | 6.57E-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 | 6.73E-03 | 0.00E+00 | 3.50E+00 | 0.00E+00 |
| Radioactive waste disposed | kg | 1.31E-03 | 1.15E-04 | 2.41E-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 | 2.62E-06 | 0.00E+00 | 6.52E-06 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 5.51E-02 | 5.36E-03 | 1.00E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.11E-04 | 0.00E+00 | 1.77E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 3.62E-03 | 1.40E-03 | 5.73E-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 | 3.05E-05 | 0.00E+00 | 9.79E-05 | 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, thermal | 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 |

# Information on biogenic carbon content

## Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.198 |

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

Results for 1m² of glass wool insulation with a thickness of 120 mm and thermal resistance of 3.50 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | D Benefits and loads beyond the limits of the system |
| GWP-fossil | kg $CO_2$ eq. | 2.19E+00 | 4.14E-01 | 3.42E-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 | 1.04E-02 | 0.00E+00 | 2.21E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -2.14E-01 | 8.49E-04 | -3.18E-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 | 1.84E-05 | 0.00E+00 | 6.33E-05 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 2.46E-03 | 1.94E-04 | 3.92E-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 | 4.11E-06 | 0.00E+00 | 2.04E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 1.98E+00 | 4.15E-01 | 3.11E-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 | 1.04E-02 | 0.00E+00 | 2.22E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 3.42E-07 | 9.31E-08 | 5.35E-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 | 2.42E-09 | 0.00E+00 | 8.95E-09 | 0.00E+00 |
| AP | mol $H^+$ eq. | 1.17E-02 | 1.64E-03 | 1.84E-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 | 5.25E-05 | 0.00E+00 | 2.08E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 2.75E-03 | 9.60E-05 | 4.40E-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 | 2.08E-06 | 0.00E+00 | 6.27E-06 | 0.00E+00 |
| EP-freshwater | kg P eq. | 8.97E-04 | 3.13E-05 | 1.43E-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 | 6.79E-07 | 0.00E+00 | 2.04E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 2.31E-03 | 4.80E-04 | 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 | 1.81E-05 | 0.00E+00 | 7.24E-05 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 2.73E-02 | 5.23E-03 | 4.31E-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 | 1.98E-04 | 0.00E+00 | 7.92E-04 | 0.00E+00 |
| POCP | kg NMVOC eq. | 7.57E-03 | 1.57E-03 | 1.20E-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 | 5.55E-05 | 0.00E+00 | 2.25E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 5.03E-04 | 1.81E-06 | 7.55E-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 | 3.49E-08 | 0.00E+00 | 4.76E-08 | 0.00E+00 |
| ADP-fossil* | MJ | 1.83E+01 | 5.32E-01 | 2.84E+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 | 1.19E-02 | 0.00E+00 | 4.63E-02 | 0.00E+00 |
| WDP* | $m^3$ | 2.80E+00 | 3.35E-02 | 4.31E-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 | 7.57E-04 | 0.00E+00 | 2.84E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[4] | kg $CO_2$ eq. | 2.13E+00 | 4.10E-01 | 3.33E-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 | 1.03E-02 | 0.00E+00 | 2.17E-02 | 0.00E+00 |

**Disclaimers shall be added, if required by EN 15804.*

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 1.65E+00 | 7.78E-02 | 2.79E-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 | 1.68E-03 | 0.00E+00 | 3.57E-03 | 0.00E+00 |
| PERM | MJ | 4.15E+00 | 2.65E-02 | 6.27E-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 | 5.50E-04 | 0.00E+00 | 1.69E-03 | 0.00E+00 |
| PERT | MJ | 5.80E+00 | 1.04E-01 | 9.07E-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 | 2.23E-03 | 0.00E+00 | 5.26E-03 | 0.00E+00 |
| PENRE | MJ | 2.30E+01 | 6.87E-01 | 3.63E+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 | 1.52E-02 | 0.00E+00 | 5.25E-02 | 0.00E+00 |
| PENRM | MJ. | 3.00E+01 | 5.56E+00 | 4.65E+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 | 1.44E-01 | 0.00E+00 | 5.69E-01 | 0.00E+00 |
| PENRT | MJ | 5.30E+01 | 6.25E+00 | 8.28E+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 | 1.59E-01 | 0.00E+00 | 6.21E-01 | 0.00E+00 |
| SM | kg | 2.72E+00 | 7.59E-03 | 4.11E-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 | 1.60E-04 | 0.00E+00 | 3.34E-04 | 0.00E+00 |
| RSF | MJ | 3.64E-02 | 2.32E-03 | 6.72E-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 | 4.76E-05 | 0.00E+00 | 5.87E-05 | 0.00E+00 |
| NRSF | MJ | 4.01E-02 | 1.01E-02 | 6.91E-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 | 1.93E-04 | 0.00E+00 | 8.46E-05 | 0.00E+00 |
| FW | $m^3$ | 6.53E-02 | 7.99E-04 | 1.01E-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 | 1.80E-05 | 0.00E+00 | 6.66E-04 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 1.47E+00 | 1.63E-01 | 2.65E-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 | 3.50E-03 | 0.00E+00 | 1.02E-02 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 8.78E-01 | 2.59E-01 | 7.64E-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 | 8.07E-03 | 0.00E+00 | 4.20E+00 | 0.00E+00 |
| Radioactive waste disposed | kg | 1.55E-03 | 1.38E-04 | 2.85E-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 | 3.15E-06 | 0.00E+00 | 7.82E-06 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 6.50E-02 | 6.43E-03 | 1.19E-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 | 1.33E-04 | 0.00E+00 | 2.12E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 4.05E-03 | 1.68E-03 | 6.42E-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 | 3.65E-05 | 0.00E+00 | 1.17E-04 | 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, thermal | 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 |

# Information on biogenic carbon content

### Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.238 |

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

Results for 1m² of glass wool insulation with a thickness of 140 mm and thermal resistance of 4.10 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | D Benefits and loads beyond the limits of the system |
| GWP-fossil | kg $CO_2$ eq. | 2.50E+00 | 4.83E-01 | 3.90E-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 | 1.21E-02 | 0.00E+00 | 2.58E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -2.50E-01 | 9.90E-04 | -3.71E-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 | 2.14E-05 | 0.00E+00 | 7.39E-05 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 2.84E-03 | 2.27E-04 | 4.53E-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 | 4.80E-06 | 0.00E+00 | 2.38E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 2.25E+00 | 4.84E-01 | 3.54E-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 | 1.21E-02 | 0.00E+00 | 2.59E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 3.86E-07 | 1.09E-07 | 6.04E-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 | 2.82E-09 | 0.00E+00 | 1.04E-08 | 0.00E+00 |
| AP | mol $H^+$ eq. | 1.34E-02 | 1.92E-03 | 2.11E-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 | 6.13E-05 | 0.00E+00 | 2.43E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 3.20E-03 | 1.12E-04 | 5.11E-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 | 2.43E-06 | 0.00E+00 | 7.31E-06 | 0.00E+00 |
| EP-freshwater | kg P eq. | 1.04E-03 | 3.65E-05 | 1.67E-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 | 7.92E-07 | 0.00E+00 | 2.38E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 2.62E-03 | 5.60E-04 | 4.19E-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 | 2.11E-05 | 0.00E+00 | 8.44E-05 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 3.11E-02 | 6.10E-03 | 4.92E-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 | 2.31E-04 | 0.00E+00 | 9.23E-04 | 0.00E+00 |
| POCP | kg NMVOC eq. | 8.60E-03 | 1.83E-03 | 1.36E-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 | 6.48E-05 | 0.00E+00 | 2.62E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 5.87E-04 | 2.11E-06 | 8.81E-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 | 4.08E-08 | 0.00E+00 | 5.55E-08 | 0.00E+00 |
| ADP-fossil* | MJ | 2.13E+01 | 6.21E-01 | 3.30E+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 | 1.39E-02 | 0.00E+00 | 5.40E-02 | 0.00E+00 |
| WDP* | $m^3$ | 3.26E+00 | 3.91E-02 | 5.02E-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 | 8.84E-04 | 0.00E+00 | 3.32E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[5] | kg $CO_2$ eq. | 2.43E+00 | 4.79E-01 | 3.80E-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 | 1.20E-02 | 0.00E+00 | 2.53E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 1.92E+00 | 9.08E-02 | 3.24E-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 | 1.96E-03 | 0.00E+00 | 4.17E-03 | 0.00E+00 |
| PERM | MJ | 4.83E+00 | 3.09E-02 | 7.30E-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 | 6.42E-04 | 0.00E+00 | 1.97E-03 | 0.00E+00 |
| PERT | MJ | 6.75E+00 | 1.22E-01 | 1.05E+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 | 2.60E-03 | 0.00E+00 | 6.14E-03 | 0.00E+00 |
| PENRE | MJ | 2.67E+01 | 8.02E-01 | 4.22E+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 | 1.77E-02 | 0.00E+00 | 6.12E-02 | 0.00E+00 |
| PENRM | MJ. | 3.42E+01 | 6.48E+00 | 5.31E+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 | 1.68E-01 | 0.00E+00 | 6.64E-01 | 0.00E+00 |
| PENRT | MJ | 6.10E+01 | 7.29E+00 | 9.53E+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 | 1.86E-01 | 0.00E+00 | 7.25E-01 | 0.00E+00 |
| SM | kg | 3.18E+00 | 8.86E-03 | 4.79E-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 | 1.86E-04 | 0.00E+00 | 3.89E-04 | 0.00E+00 |
| RSF | MJ | 4.21E-02 | 2.70E-03 | 7.79E-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 | 5.55E-05 | 0.00E+00 | 6.85E-05 | 0.00E+00 |
| NRSF | MJ | 4.52E-02 | 1.17E-02 | 7.82E-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 | 2.25E-04 | 0.00E+00 | 9.87E-05 | 0.00E+00 |
| FW | $m^3$ | 7.61E-02 | 9.32E-04 | 1.17E-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 | 2.10E-05 | 0.00E+00 | 7.78E-04 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 1.69E+00 | 1.90E-01 | 3.05E-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 | 4.08E-03 | 0.00E+00 | 1.19E-02 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 8.88E-01 | 3.02E-01 | 8.71E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.42E-03 | 0.00E+00 | 4.90E+00 | 0.00E+00 |
| Radioactive waste disposed | kg | 1.79E-03 | 1.61E-04 | 3.30E-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 | 3.67E-06 | 0.00E+00 | 9.13E-06 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 7.49E-02 | 7.50E-03 | 1.37E-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 | 1.55E-04 | 0.00E+00 | 2.48E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 4.47E-03 | 1.96E-03 | 7.11E-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 | 4.26E-05 | 0.00E+00 | 1.37E-04 | 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, thermal | 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 |

# Information on biogenic carbon content

### Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.278 |

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

Results for 1m² of glass wool insulation with a thickness of 160 mm and thermal resistance of 4.70 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | D Benefits and loads beyond the limits of the system |
| GWP-fossil | kg $CO_2$ eq. | 2.81E+00 | 5.52E-01 | 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 | 1.38E-02 | 0.00E+00 | 2.95E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -2.87E-01 | 1.13E-03 | -4.26E-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 | 2.45E-05 | 0.00E+00 | 8.44E-05 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 3.22E-03 | 2.59E-04 | 5.14E-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 | 5.49E-06 | 0.00E+00 | 2.72E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 2.52E+00 | 5.53E-01 | 3.97E-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-02 | 0.00E+00 | 2.96E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 4.30E-07 | 1.24E-07 | 6.74E-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 | 3.23E-09 | 0.00E+00 | 1.19E-08 | 0.00E+00 |
| AP | mol $H^+$ eq. | 1.51E-02 | 2.19E-03 | 2.38E-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 | 7.01E-05 | 0.00E+00 | 2.77E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 3.64E-03 | 1.28E-04 | 5.83E-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 | 2.78E-06 | 0.00E+00 | 8.36E-06 | 0.00E+00 |
| EP-freshwater | kg P eq. | 1.19E-03 | 4.17E-05 | 1.90E-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 | 9.05E-07 | 0.00E+00 | 2.72E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 2.94E-03 | 6.40E-04 | 4.70E-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 | 2.42E-05 | 0.00E+00 | 9.65E-05 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 3.49E-02 | 6.97E-03 | 5.52E-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 | 2.64E-04 | 0.00E+00 | 1.06E-03 | 0.00E+00 |
| POCP | kg NMVOC eq. | 9.63E-03 | 2.10E-03 | 1.53E-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 | 7.41E-05 | 0.00E+00 | 3.00E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 6.70E-04 | 2.42E-06 | 1.01E-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 | 4.66E-08 | 0.00E+00 | 6.34E-08 | 0.00E+00 |
| ADP-fossil* | MJ | 2.43E+01 | 7.09E-01 | 3.77E+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 | 1.59E-02 | 0.00E+00 | 6.17E-02 | 0.00E+00 |
| WDP* | $m^3$ | 3.72E+00 | 4.47E-02 | 5.73E-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 | 1.01E-03 | 0.00E+00 | 3.79E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[6] | kg $CO_2$ eq. | 2.73E+00 | 5.47E-01 | 4.27E-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 | 1.37E-02 | 0.00E+00 | 2.89E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 2.18E+00 | 1.04E-01 | 3.69E-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 | 2.24E-03 | 0.00E+00 | 4.76E-03 | 0.00E+00 |
| PERM | MJ | 5.53E+00 | 3.53E-02 | 8.36E-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 | 7.34E-04 | 0.00E+00 | 2.25E-03 | 0.00E+00 |
| PERT | MJ | 7.71E+00 | 1.39E-01 | 1.20E+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 | 2.97E-03 | 0.00E+00 | 7.02E-03 | 0.00E+00 |
| PENRE | MJ | 3.05E+01 | 9.16E-01 | 4.81E+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 | 2.03E-02 | 0.00E+00 | 7.00E-02 | 0.00E+00 |
| PENRM | MJ. | 3.85E+01 | 7.41E+00 | 5.97E+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 | 1.92E-01 | 0.00E+00 | 7.59E-01 | 0.00E+00 |
| PENRT | MJ | 6.89E+01 | 8.33E+00 | 1.08E+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 | 2.12E-01 | 0.00E+00 | 8.29E-01 | 0.00E+00 |
| SM | kg | 3.63E+00 | 1.01E-02 | 5.47E-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 | 2.13E-04 | 0.00E+00 | 4.45E-04 | 0.00E+00 |
| RSF | MJ | 4.79E-02 | 3.09E-03 | 8.87E-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 | 6.35E-05 | 0.00E+00 | 7.82E-05 | 0.00E+00 |
| NRSF | MJ | 5.02E-02 | 1.34E-02 | 8.73E-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 | 2.57E-04 | 0.00E+00 | 1.13E-04 | 0.00E+00 |
| FW | $m^3$ | 8.69E-02 | 1.06E-03 | 1.34E-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 | 2.41E-05 | 0.00E+00 | 8.89E-04 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 1.92E+00 | 2.17E-01 | 3.46E-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 | 4.66E-03 | 0.00E+00 | 1.36E-02 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 8.99E-01 | 3.45E-01 | 9.78E-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 | 1.08E-02 | 0.00E+00 | 5.60E+00 | 0.00E+00 |
| Radioactive waste disposed | kg | 2.03E-03 | 1.84E-04 | 3.75E-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 | 4.20E-06 | 0.00E+00 | 1.04E-05 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 8.49E-02 | 8.57E-03 | 1.56E-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 | 1.77E-04 | 0.00E+00 | 2.83E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 4.90E-03 | 2.24E-03 | 7.81E-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 | 4.87E-05 | 0.00E+00 | 1.57E-04 | 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, thermal | 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 |

# Information on biogenic carbon content

## Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.317 |

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

Results for 1m² of glass wool insulation with a thickness of 180 mm and thermal resistance of 5.25 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | D Benefits and loads beyond the limits of the system |
| GWP-fossil | kg $CO_2$ eq. | 3.12E+00 | 6.21E-01 | 4.87E-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 | 1.56E-02 | 0.00E+00 | 3.32E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -3.23E-01 | 1.27E-03 | -4.80E-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 | 2.75E-05 | 0.00E+00 | 9.50E-05 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 3.60E-03 | 2.92E-04 | 5.75E-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 | 6.17E-06 | 0.00E+00 | 3.06E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 2.80E+00 | 6.23E-01 | 4.40E-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 | 1.56E-02 | 0.00E+00 | 3.33E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 4.74E-07 | 1.40E-07 | 7.43E-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 | 3.63E-09 | 0.00E+00 | 1.34E-08 | 0.00E+00 |
| AP | mol $H^+$ eq. | 1.68E-02 | 2.47E-03 | 2.65E-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 | 7.88E-05 | 0.00E+00 | 3.12E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 4.09E-03 | 1.44E-04 | 6.54E-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 | 3.13E-06 | 0.00E+00 | 9.40E-06 | 0.00E+00 |
| EP-freshwater | kg P eq. | 1.33E-03 | 4.69E-05 | 2.13E-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 | 1.02E-06 | 0.00E+00 | 3.06E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 3.25E-03 | 7.20E-04 | 5.20E-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 | 2.72E-05 | 0.00E+00 | 1.09E-04 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 3.87E-02 | 7.85E-03 | 6.13E-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 | 2.97E-04 | 0.00E+00 | 1.19E-03 | 0.00E+00 |
| POCP | kg NMVOC eq. | 1.07E-02 | 2.36E-03 | 1.69E-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 | 8.33E-05 | 0.00E+00 | 3.37E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 7.54E-04 | 2.72E-06 | 1.13E-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 | 5.24E-08 | 0.00E+00 | 7.14E-08 | 0.00E+00 |
| ADP-fossil* | MJ | 2.73E+01 | 7.98E-01 | 4.23E+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 | 1.78E-02 | 0.00E+00 | 6.94E-02 | 0.00E+00 |
| WDP* | $m^3$ | 4.18E+00 | 5.03E-02 | 6.44E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.14E-03 | 0.00E+00 | 4.27E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[7] | kg $CO_2$ eq. | 3.03E+00 | 6.15E-01 | 4.73E-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 | 1.54E-02 | 0.00E+00 | 3.26E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 2.45E+00 | 1.17E-01 | 4.14E-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 | 2.52E-03 | 0.00E+00 | 5.36E-03 | 0.00E+00 |
| PERM | MJ | 6.22E+00 | 3.97E-02 | 9.40E-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 | 8.26E-04 | 0.00E+00 | 2.53E-03 | 0.00E+00 |
| PERT | MJ | 8.66E+00 | 1.56E-01 | 1.35E+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 | 3.34E-03 | 0.00E+00 | 7.90E-03 | 0.00E+00 |
| PENRE | MJ | 3.42E+01 | 1.03E+00 | 5.40E+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 | 2.28E-02 | 0.00E+00 | 7.87E-02 | 0.00E+00 |
| PENRM | MJ. | 4.27E+01 | 8.34E+00 | 6.63E+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 | 2.16E-01 | 0.00E+00 | 8.53E-01 | 0.00E+00 |
| PENRT | MJ | 7.69E+01 | 9.37E+00 | 1.20E+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 | 2.39E-01 | 0.00E+00 | 9.32E-01 | 0.00E+00 |
| SM | kg | 4.08E+00 | 1.14E-02 | 6.16E-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 | 2.40E-04 | 0.00E+00 | 5.00E-04 | 0.00E+00 |
| RSF | MJ | 5.36E-02 | 3.47E-03 | 9.94E-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 | 7.14E-05 | 0.00E+00 | 8.80E-05 | 0.00E+00 |
| NRSF | MJ | 5.53E-02 | 1.51E-02 | 9.63E-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 | 2.90E-04 | 0.00E+00 | 1.27E-04 | 0.00E+00 |
| FW | $m^3$ | 9.77E-02 | 1.20E-03 | 1.50E-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 | 2.71E-05 | 0.00E+00 | 1.00E-03 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 2.14E+00 | 2.44E-01 | 3.87E-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 | 5.25E-03 | 0.00E+00 | 1.53E-02 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 9.09E-01 | 3.88E-01 | 1.08E+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 | 1.21E-02 | 0.00E+00 | 6.30E+00 | 0.00E+00 |
| Radioactive waste disposed | kg | 2.26E-03 | 2.07E-04 | 4.20E-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 | 4.72E-06 | 0.00E+00 | 1.17E-05 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 9.48E-02 | 9.64E-03 | 1.74E-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 | 1.99E-04 | 0.00E+00 | 3.18E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 5.32E-03 | 2.52E-03 | 8.50E-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 | 5.48E-05 | 0.00E+00 | 1.76E-04 | 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, thermal | 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 |

# Information on biogenic carbon content

### Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.357 |

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

Results for 1m² of glass wool insulation with a thickness of 200 mm and thermal resistance of 5.85 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-fossil | kg $CO_2$ eq. | 3.42E+00 | 6.90E-01 | 5.35E-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 | 1.73E-02 | 0.00E+00 | 3.68E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -3.59E-01 | 1.41E-03 | -5.33E-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 | 3.06E-05 | 0.00E+00 | 1.06E-04 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 3.98E-03 | 3.24E-04 | 6.35E-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 | 6.86E-06 | 0.00E+00 | 3.40E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 3.07E+00 | 6.92E-01 | 4.83E-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 | 1.73E-02 | 0.00E+00 | 3.70E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 5.18E-07 | 1.55E-07 | 8.13E-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 | 4.04E-09 | 0.00E+00 | 1.49E-08 | 0.00E+00 |
| AP | mol $H^+$ eq. | 1.85E-02 | 2.74E-03 | 2.92E-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 | 8.76E-05 | 0.00E+00 | 3.46E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 4.53E-03 | 1.60E-04 | 7.25E-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 | 3.47E-06 | 0.00E+00 | 1.04E-05 | 0.00E+00 |
| EP-freshwater | kg P eq. | 1.48E-03 | 5.21E-05 | 2.36E-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 | 1.13E-06 | 0.00E+00 | 3.40E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 3.57E-03 | 7.99E-04 | 5.71E-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 | 3.02E-05 | 0.00E+00 | 1.21E-04 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 4.24E-02 | 8.72E-03 | 6.73E-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 | 3.30E-04 | 0.00E+00 | 1.32E-03 | 0.00E+00 |
| POCP | kg NMVOC eq. | 1.17E-02 | 2.62E-03 | 1.86E-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 | 9.26E-05 | 0.00E+00 | 3.75E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 8.37E-04 | 3.02E-06 | 1.26E-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 | 5.82E-08 | 0.00E+00 | 7.93E-08 | 0.00E+00 |
| ADP-fossil* | MJ | 3.02E+01 | 8.87E-01 | 4.69E+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 | 1.98E-02 | 0.00E+00 | 7.71E-02 | 0.00E+00 |
| WDP* | $m^3$ | 4.65E+00 | 5.59E-02 | 7.15E-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 | 1.26E-03 | 0.00E+00 | 4.74E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[8] | kg $CO_2$ eq. | 3.32E+00 | 6.84E-01 | 5.20E-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 | 1.71E-02 | 0.00E+00 | 3.62E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 2.71E+00 | 1.30E-01 | 4.59E-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 | 2.80E-03 | 0.00E+00 | 5.96E-03 | 0.00E+00 |
| PERM | MJ | 6.90E+00 | 4.41E-02 | 1.04E+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 | 9.17E-04 | 0.00E+00 | 2.82E-03 | 0.00E+00 |
| PERT | MJ | 9.61E+00 | 1.74E-01 | 1.50E+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 | 3.71E-03 | 0.00E+00 | 8.77E-03 | 0.00E+00 |
| PENRE | MJ | 3.79E+01 | 1.15E+00 | 5.99E+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 | 2.53E-02 | 0.00E+00 | 8.75E-02 | 0.00E+00 |
| PENRM | MJ. | 4.69E+01 | 9.26E+00 | 7.29E+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 | 2.40E-01 | 0.00E+00 | 9.48E-01 | 0.00E+00 |
| PENRT | MJ | 8.49E+01 | 1.04E+01 | 1.33E+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 | 2.65E-01 | 0.00E+00 | 1.04E+00 | 0.00E+00 |
| SM | kg | 4.53E+00 | 1.27E-02 | 6.84E-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 | 2.66E-04 | 0.00E+00 | 5.56E-04 | 0.00E+00 |
| RSF | MJ | 5.94E-02 | 3.86E-03 | 1.10E-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 | 7.93E-05 | 0.00E+00 | 9.78E-05 | 0.00E+00 |
| NRSF | MJ | 6.03E-02 | 1.68E-02 | 1.05E-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 | 3.22E-04 | 0.00E+00 | 1.41E-04 | 0.00E+00 |
| FW | $m^3$ | 1.08E-01 | 1.33E-03 | 1.67E-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 | 3.01E-05 | 0.00E+00 | 1.11E-03 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 2.36E+00 | 2.71E-01 | 4.27E-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 | 5.83E-03 | 0.00E+00 | 1.70E-02 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 9.20E-01 | 4.31E-01 | 1.19E+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 | 1.35E-02 | 0.00E+00 | 7.00E+00 | 0.00E+00 |
| Radioactive waste disposed | kg | 2.50E-03 | 2.30E-04 | 4.64E-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 | 5.25E-06 | 0.00E+00 | 1.30E-05 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 1.05E-01 | 1.07E-02 | 1.92E-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 | 2.21E-04 | 0.00E+00 | 3.54E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 5.74E-03 | 2.80E-03 | 9.20E-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 | 6.09E-05 | 0.00E+00 | 1.96E-04 | 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, thermal | 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 |

# Information on biogenic carbon content

### Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.396 |

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

Results for 1m² of glass wool insulation with a thickness of 220 mm and thermal resistance of 6.45 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-fossil | kg $CO_2$ eq. | 3.73E+00 | 7.59E-01 | 5.84E-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 | 1.90E-02 | 0.00E+00 | 4.05E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -3.94E-01 | 1.56E-03 | -5.85E-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 | 3.37E-05 | 0.00E+00 | 1.16E-04 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 4.35E-03 | 3.57E-04 | 6.96E-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 | 7.54E-06 | 0.00E+00 | 3.74E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 3.34E+00 | 7.61E-01 | 5.26E-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 | 1.91E-02 | 0.00E+00 | 4.07E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 5.62E-07 | 1.71E-07 | 8.82E-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 | 4.44E-09 | 0.00E+00 | 1.64E-08 | 0.00E+00 |
| AP | mol $H^+$ eq. | 2.02E-02 | 3.01E-03 | 3.19E-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 | 9.63E-05 | 0.00E+00 | 3.81E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 4.98E-03 | 1.76E-04 | 7.96E-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 | 3.82E-06 | 0.00E+00 | 1.15E-05 | 0.00E+00 |
| EP-freshwater | kg P eq. | 1.62E-03 | 5.74E-05 | 2.59E-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 | 1.24E-06 | 0.00E+00 | 3.74E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 3.88E-03 | 8.79E-04 | 6.22E-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 | 3.32E-05 | 0.00E+00 | 1.33E-04 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 4.62E-02 | 9.59E-03 | 7.33E-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 | 3.63E-04 | 0.00E+00 | 1.45E-03 | 0.00E+00 |
| POCP | kg NMVOC eq. | 1.27E-02 | 2.88E-03 | 2.02E-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 | 1.02E-04 | 0.00E+00 | 4.12E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 9.21E-04 | 3.32E-06 | 1.38E-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 | 6.41E-08 | 0.00E+00 | 8.72E-08 | 0.00E+00 |
| ADP-fossil* | MJ | 3.32E+01 | 9.75E-01 | 5.15E+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 | 2.18E-02 | 0.00E+00 | 8.48E-02 | 0.00E+00 |
| WDP* | $m^3$ | 5.11E+00 | 6.15E-02 | 7.86E-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-03 | 0.00E+00 | 5.21E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[9] | kg $CO_2$ eq. | 3.62E+00 | 7.52E-01 | 5.67E-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 | 1.89E-02 | 0.00E+00 | 3.98E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 2.97E+00 | 1.43E-01 | 5.04E-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 | 3.08E-03 | 0.00E+00 | 6.55E-03 | 0.00E+00 |
| PERM | MJ | 7.57E+00 | 4.85E-02 | 1.14E+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 | 1.01E-03 | 0.00E+00 | 3.10E-03 | 0.00E+00 |
| PERT | MJ | 1.05E+01 | 1.91E-01 | 1.65E+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 | 4.08E-03 | 0.00E+00 | 9.65E-03 | 0.00E+00 |
| PENRE | MJ | 4.17E+01 | 1.26E+00 | 6.58E+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 | 2.79E-02 | 0.00E+00 | 9.62E-02 | 0.00E+00 |
| PENRM | MJ. | 5.11E+01 | 1.02E+01 | 7.94E+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 | 2.64E-01 | 0.00E+00 | 1.04E+00 | 0.00E+00 |
| PENRT | MJ | 9.28E+01 | 1.14E+01 | 1.45E+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 | 2.92E-01 | 0.00E+00 | 1.14E+00 | 0.00E+00 |
| SM | kg | 4.99E+00 | 1.39E-02 | 7.52E-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 | 2.93E-04 | 0.00E+00 | 6.12E-04 | 0.00E+00 |
| RSF | MJ | 6.51E-02 | 4.25E-03 | 1.21E-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 | 8.73E-05 | 0.00E+00 | 1.08E-04 | 0.00E+00 |
| NRSF | MJ | 6.53E-02 | 1.84E-02 | 1.14E-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 | 3.54E-04 | 0.00E+00 | 1.55E-04 | 0.00E+00 |
| FW | $m^3$ | 1.19E-01 | 1.46E-03 | 1.84E-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 | 3.31E-05 | 0.00E+00 | 1.22E-03 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 2.59E+00 | 2.98E-01 | 4.68E-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 | 6.41E-03 | 0.00E+00 | 1.87E-02 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 9.30E-01 | 4.75E-01 | 1.30E+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 | 1.48E-02 | 0.00E+00 | 7.71E+00 | 0.00E+00 |
| Radioactive waste disposed | kg | 2.74E-03 | 2.54E-04 | 5.09E-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 | 5.77E-06 | 0.00E+00 | 1.43E-05 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 1.15E-01 | 1.18E-02 | 2.11E-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 | 2.43E-04 | 0.00E+00 | 3.89E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 6.16E-03 | 3.08E-03 | 9.88E-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 | 6.70E-05 | 0.00E+00 | 2.15E-04 | 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, thermal | 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 |

# Information on biogenic carbon content

## Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.436 |

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

Results for 1m² of glass wool insulation with a thickness of 240 mm and thermal resistance of 7.05 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-fossil | kg $CO_2$ eq. | 4.04E+00 | 8.28E-01 | 6.32E-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 | 2.08E-02 | 0.00E+00 | 4.42E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -4.30E-01 | 1.70E-03 | -6.38E-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 | 3.67E-05 | 0.00E+00 | 1.27E-04 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 4.73E-03 | 3.89E-04 | 7.57E-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 | 8.23E-06 | 0.00E+00 | 4.08E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 3.61E+00 | 8.30E-01 | 5.69E-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 | 2.08E-02 | 0.00E+00 | 4.44E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 6.06E-07 | 1.86E-07 | 9.52E-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 | 4.84E-09 | 0.00E+00 | 1.79E-08 | 0.00E+00 |
| AP | mol $H^+$ eq. | 2.19E-02 | 3.29E-03 | 3.46E-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 | 1.05E-04 | 0.00E+00 | 4.16E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 5.42E-03 | 1.92E-04 | 8.68E-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 | 4.17E-06 | 0.00E+00 | 1.25E-05 | 0.00E+00 |
| EP-freshwater | kg P eq. | 1.77E-03 | 6.26E-05 | 2.83E-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 | 1.36E-06 | 0.00E+00 | 4.08E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 4.20E-03 | 9.59E-04 | 6.73E-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 | 3.62E-05 | 0.00E+00 | 1.45E-04 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 5.00E-02 | 1.05E-02 | 7.94E-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 | 3.96E-04 | 0.00E+00 | 1.58E-03 | 0.00E+00 |
| POCP | kg NMVOC eq. | 1.37E-02 | 3.14E-03 | 2.18E-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 | 1.11E-04 | 0.00E+00 | 4.50E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 1.00E-03 | 3.62E-06 | 1.51E-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 | 6.99E-08 | 0.00E+00 | 9.52E-08 | 0.00E+00 |
| ADP-fossil* | MJ | 3.62E+01 | 1.06E+00 | 5.62E+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 | 2.38E-02 | 0.00E+00 | 9.25E-02 | 0.00E+00 |
| WDP* | $m^3$ | 5.57E+00 | 6.71E-02 | 8.57E-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 | 1.51E-03 | 0.00E+00 | 5.69E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[10] | kg $CO_2$ eq. | 3.92E+00 | 8.21E-01 | 6.14E-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 | 2.06E-02 | 0.00E+00 | 4.34E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 3.24E+00 | 1.56E-01 | 5.49E-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 | 3.36E-03 | 0.00E+00 | 7.15E-03 | 0.00E+00 |
| PERM | MJ | 8.26E+00 | 5.29E-02 | 1.25E+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 | 1.10E-03 | 0.00E+00 | 3.38E-03 | 0.00E+00 |
| PERT | MJ | 1.15E+01 | 2.09E-01 | 1.80E+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 | 4.46E-03 | 0.00E+00 | 1.05E-02 | 0.00E+00 |
| PENRE | MJ | 4.54E+01 | 1.37E+00 | 7.17E+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 | 3.04E-02 | 0.00E+00 | 1.05E-01 | 0.00E+00 |
| PENRM | MJ. | 5.54E+01 | 1.11E+01 | 8.60E+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 | 2.88E-01 | 0.00E+00 | 1.14E+00 | 0.00E+00 |
| PENRT | MJ | 1.01E+02 | 1.25E+01 | 1.58E+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 | 3.18E-01 | 0.00E+00 | 1.24E+00 | 0.00E+00 |
| SM | kg | 5.44E+00 | 1.52E-02 | 8.21E-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 | 3.20E-04 | 0.00E+00 | 6.67E-04 | 0.00E+00 |
| RSF | MJ | 7.09E-02 | 4.63E-03 | 1.32E-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 | 9.52E-05 | 0.00E+00 | 1.17E-04 | 0.00E+00 |
| NRSF | MJ | 7.04E-02 | 2.01E-02 | 1.23E-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 | 3.86E-04 | 0.00E+00 | 1.69E-04 | 0.00E+00 |
| FW | $m^3$ | 1.30E-01 | 1.60E-03 | 2.00E-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 | 3.61E-05 | 0.00E+00 | 1.33E-03 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 2.81E+00 | 3.25E-01 | 5.09E-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 | 7.00E-03 | 0.00E+00 | 2.04E-02 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 9.41E-01 | 5.18E-01 | 1.41E+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 | 1.61E-02 | 0.00E+00 | 8.41E+00 | 0.00E+00 |
| Radioactive waste disposed | kg | 2.98E-03 | 2.77E-04 | 5.54E-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 | 6.30E-06 | 0.00E+00 | 1.56E-05 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 1.25E-01 | 1.29E-02 | 2.29E-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 | 2.65E-04 | 0.00E+00 | 4.24E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 6.59E-03 | 3.36E-03 | 1.06E-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 | 7.31E-05 | 0.00E+00 | 2.35E-04 | 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, thermal | 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 |

# Information on biogenic carbon content

### Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.436 |

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

Results for 1m² of glass wool insulation with a thickness of 260 mm and thermal resistance of 7.65 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | D Benefits and loads beyond the limits of the system |
| GWP-fossil | kg $CO_2$ eq. | 4.35E+00 | 8.97E-01 | 6.80E-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 | 2.25E-02 | 0.00E+00 | 4.79E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -4.68E-01 | 1.84E-03 | -6.96E-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 | 3.98E-05 | 0.00E+00 | 1.37E-04 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 5.12E-03 | 4.21E-04 | 8.18E-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 | 8.91E-06 | 0.00E+00 | 4.42E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 3.88E+00 | 8.99E-01 | 6.12E-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 | 2.25E-02 | 0.00E+00 | 4.81E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 6.50E-07 | 2.02E-07 | 1.02E-07 | 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 | 0.00E+00 | 1.94E-08 | 0.00E+00 |
| AP | mol $H^+$ eq. | 2.36E-02 | 3.56E-03 | 3.73E-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 | 1.14E-04 | 0.00E+00 | 4.50E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 5.87E-03 | 2.08E-04 | 9.39E-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 | 4.52E-06 | 0.00E+00 | 1.36E-05 | 0.00E+00 |
| EP-freshwater | kg P eq. | 1.91E-03 | 6.78E-05 | 3.06E-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 | 1.47E-06 | 0.00E+00 | 4.42E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 4.51E-03 | 1.04E-03 | 7.24E-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 | 3.93E-05 | 0.00E+00 | 1.57E-04 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 5.38E-02 | 1.13E-02 | 8.54E-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 | 4.29E-04 | 0.00E+00 | 1.71E-03 | 0.00E+00 |
| POCP | kg NMVOC eq. | 1.48E-02 | 3.41E-03 | 2.35E-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 | 1.20E-04 | 0.00E+00 | 4.87E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 1.09E-03 | 3.92E-06 | 1.63E-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 | 7.57E-08 | 0.00E+00 | 1.03E-07 | 0.00E+00 |
| ADP-fossil* | MJ | 3.92E+01 | 1.15E+00 | 6.08E+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-02 | 0.00E+00 | 1.00E-01 | 0.00E+00 |
| WDP* | $m^3$ | 6.03E+00 | 7.27E-02 | 9.28E-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 | 1.64E-03 | 0.00E+00 | 6.16E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[11] | kg $CO_2$ eq. | 4.22E+00 | 8.89E-01 | 6.61E-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 | 2.23E-02 | 0.00E+00 | 4.70E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 3.50E+00 | 1.69E-01 | 5.94E-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 | 3.64E-03 | 0.00E+00 | 7.74E-03 | 0.00E+00 |
| PERM | MJ | 8.98E+00 | 5.73E-02 | 1.36E+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 | 1.19E-03 | 0.00E+00 | 3.66E-03 | 0.00E+00 |
| PERT | MJ | 1.25E+01 | 2.26E-01 | 1.95E+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 | 4.83E-03 | 0.00E+00 | 1.14E-02 | 0.00E+00 |
| PENRE | MJ | 4.91E+01 | 1.49E+00 | 7.76E+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 | 3.29E-02 | 0.00E+00 | 1.14E-01 | 0.00E+00 |
| PENRM | MJ. | 5.96E+01 | 1.20E+01 | 9.26E+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 | 3.12E-01 | 0.00E+00 | 1.23E+00 | 0.00E+00 |
| PENRT | MJ | 1.09E+02 | 1.35E+01 | 1.70E+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 | 3.45E-01 | 0.00E+00 | 1.35E+00 | 0.00E+00 |
| SM | kg | 5.89E+00 | 1.64E-02 | 8.89E-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 | 3.46E-04 | 0.00E+00 | 7.23E-04 | 0.00E+00 |
| RSF | MJ | 7.66E-02 | 5.02E-03 | 1.42E-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 | 1.03E-04 | 0.00E+00 | 1.27E-04 | 0.00E+00 |
| NRSF | MJ | 7.54E-02 | 2.18E-02 | 1.33E-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 | 4.18E-04 | 0.00E+00 | 1.83E-04 | 0.00E+00 |
| FW | $m^3$ | 1.41E-01 | 1.73E-03 | 2.17E-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 | 3.91E-05 | 0.00E+00 | 1.44E-03 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 3.03E+00 | 3.53E-01 | 5.49E-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 | 7.58E-03 | 0.00E+00 | 2.21E-02 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 9.52E-01 | 5.61E-01 | 1.51E+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 | 1.75E-02 | 0.00E+00 | 9.11E+00 | 0.00E+00 |
| Radioactive waste disposed | kg | 3.22E-03 | 3.00E-04 | 5.99E-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 | 6.82E-06 | 0.00E+00 | 1.69E-05 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 1.35E-01 | 1.39E-02 | 2.48E-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 | 2.88E-04 | 0.00E+00 | 4.60E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 7.02E-03 | 3.64E-03 | 1.13E-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 | 7.92E-05 | 0.00E+00 | 2.54E-04 | 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, thermal | 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 |

# Information on biogenic carbon content

### Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.515 |

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

Results for 1m² of glass wool insulation with a thickness of 280 mm and thermal resistance of 8.20 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-fossil | kg $CO_2$ eq. | 4.65E+00 | 9.66E-01 | 7.29E-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 | 2.42E-02 | 0.00E+00 | 5.16E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -5.05E-01 | 1.98E-03 | -7.49E-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 | 4.29E-05 | 0.00E+00 | 1.48E-04 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 5.50E-03 | 4.54E-04 | 8.79E-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 | 9.60E-06 | 0.00E+00 | 4.76E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 4.15E+00 | 9.68E-01 | 6.55E-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 | 2.43E-02 | 0.00E+00 | 5.18E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 6.94E-07 | 2.17E-07 | 1.09E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.65E-09 | 0.00E+00 | 2.09E-08 | 0.00E+00 |
| AP | mol $H^+$ eq. | 2.53E-02 | 3.84E-03 | 4.00E-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 | 1.23E-04 | 0.00E+00 | 4.85E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 6.32E-03 | 2.24E-04 | 1.01E-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 | 4.86E-06 | 0.00E+00 | 1.46E-05 | 0.00E+00 |
| EP-freshwater | kg P eq. | 2.06E-03 | 7.30E-05 | 3.29E-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 | 1.58E-06 | 0.00E+00 | 4.76E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 4.83E-03 | 1.12E-03 | 7.74E-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 | 4.23E-05 | 0.00E+00 | 1.69E-04 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 5.76E-02 | 1.22E-02 | 9.15E-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 | 4.62E-04 | 0.00E+00 | 1.85E-03 | 0.00E+00 |
| POCP | kg NMVOC eq. | 1.58E-02 | 3.67E-03 | 2.51E-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 | 1.30E-04 | 0.00E+00 | 5.24E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 1.17E-03 | 4.23E-06 | 1.76E-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 | 8.15E-08 | 0.00E+00 | 1.11E-07 | 0.00E+00 |
| ADP-fossil* | MJ | 4.22E+01 | 1.24E+00 | 6.54E+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 | 2.78E-02 | 0.00E+00 | 1.08E-01 | 0.00E+00 |
| WDP* | $m^3$ | 6.49E+00 | 7.83E-02 | 9.99E-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 | 1.77E-03 | 0.00E+00 | 6.63E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[12] | kg $CO_2$ eq. | 4.52E+00 | 9.57E-01 | 7.08E-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 | 2.40E-02 | 0.00E+00 | 5.07E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 3.77E+00 | 1.82E-01 | 6.39E-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 | 3.91E-03 | 0.00E+00 | 8.34E-03 | 0.00E+00 |
| PERM | MJ | 9.66E+00 | 6.17E-02 | 1.46E+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 | 1.28E-03 | 0.00E+00 | 3.94E-03 | 0.00E+00 |
| PERT | MJ | 1.34E+01 | 2.43E-01 | 2.10E+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 | 5.20E-03 | 0.00E+00 | 1.23E-02 | 0.00E+00 |
| PENRE | MJ | 5.29E+01 | 1.60E+00 | 8.35E+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 | 3.54E-02 | 0.00E+00 | 1.22E-01 | 0.00E+00 |
| PENRM | MJ. | 6.38E+01 | 1.30E+01 | 9.92E+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 | 3.36E-01 | 0.00E+00 | 1.33E+00 | 0.00E+00 |
| PENRT | MJ | 1.17E+02 | 1.46E+01 | 1.83E+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 | 3.71E-01 | 0.00E+00 | 1.45E+00 | 0.00E+00 |
| SM | kg | 6.35E+00 | 1.77E-02 | 9.57E-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 | 3.73E-04 | 0.00E+00 | 7.78E-04 | 0.00E+00 |
| RSF | MJ | 8.24E-02 | 5.40E-03 | 1.53E-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 | 1.11E-04 | 0.00E+00 | 1.37E-04 | 0.00E+00 |
| NRSF | MJ | 8.05E-02 | 2.35E-02 | 1.42E-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 | 4.51E-04 | 0.00E+00 | 1.97E-04 | 0.00E+00 |
| FW | $m^3$ | 1.52E-01 | 1.86E-03 | 2.33E-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 | 4.21E-05 | 0.00E+00 | 1.56E-03 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 3.25E+00 | 3.80E-01 | 5.90E-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-03 | 0.00E+00 | 2.38E-02 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 9.62E-01 | 6.04E-01 | 1.62E+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 | 1.88E-02 | 0.00E+00 | 9.81E+00 | 0.00E+00 |
| Radioactive waste disposed | kg | 3.46E-03 | 3.23E-04 | 6.43E-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 | 7.35E-06 | 0.00E+00 | 1.83E-05 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 1.44E-01 | 1.50E-02 | 2.66E-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 | 3.10E-04 | 0.00E+00 | 4.95E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 7.44E-03 | 3.92E-03 | 1.20E-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 | 8.53E-05 | 0.00E+00 | 2.74E-04 | 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, thermal | 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 |

# Information on biogenic carbon content

### Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.555 |

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

Results for 1m² of glass wool insulation with a thickness of 300 mm and thermal resistance of 8.80 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | D Benefits and loads beyond the limits of the system |
| GWP-fossil | kg $CO_2$ eq. | 4.96E+00 | 1.03E+00 | 7.77E-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 | 2.59E-02 | 0.00E+00 | 5.53E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -5.40E-01 | 2.12E-03 | -8.01E-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 | 4.59E-05 | 0.00E+00 | 1.58E-04 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 5.88E-03 | 4.86E-04 | 9.40E-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 | 1.03E-05 | 0.00E+00 | 5.11E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 4.43E+00 | 1.04E+00 | 6.98E-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 | 2.60E-02 | 0.00E+00 | 5.55E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 7.38E-07 | 2.33E-07 | 1.16E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.05E-09 | 0.00E+00 | 2.24E-08 | 0.00E+00 |
| AP | mol $H^+$ eq. | 2.71E-02 | 4.11E-03 | 4.27E-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 | 1.31E-04 | 0.00E+00 | 5.20E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 6.76E-03 | 2.40E-04 | 1.08E-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 | 5.21E-06 | 0.00E+00 | 1.57E-05 | 0.00E+00 |
| EP-freshwater | kg P eq. | 2.20E-03 | 7.82E-05 | 3.52E-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 | 1.70E-06 | 0.00E+00 | 5.10E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 5.14E-03 | 1.20E-03 | 8.25E-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 | 4.53E-05 | 0.00E+00 | 1.81E-04 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 6.14E-02 | 1.31E-02 | 9.75E-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 | 4.95E-04 | 0.00E+00 | 1.98E-03 | 0.00E+00 |
| POCP | kg NMVOC eq. | 1.68E-02 | 3.93E-03 | 2.68E-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 | 1.39E-04 | 0.00E+00 | 5.62E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 1.26E-03 | 4.53E-06 | 1.89E-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 | 8.74E-08 | 0.00E+00 | 1.19E-07 | 0.00E+00 |
| ADP-fossil* | MJ | 4.51E+01 | 1.33E+00 | 7.00E+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 | 2.97E-02 | 0.00E+00 | 1.16E-01 | 0.00E+00 |
| WDP* | $m^3$ | 6.96E+00 | 8.39E-02 | 1.07E+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 | 1.89E-03 | 0.00E+00 | 7.11E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[13] | kg $CO_2$ eq. | 4.81E+00 | 1.03E+00 | 7.55E-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 | 2.57E-02 | 0.00E+00 | 5.43E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 4.03E+00 | 1.95E-01 | 6.84E-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 | 4.19E-03 | 0.00E+00 | 8.93E-03 | 0.00E+00 |
| PERM | MJ | 1.03E+01 | 6.61E-02 | 1.56E+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 | 1.38E-03 | 0.00E+00 | 4.22E-03 | 0.00E+00 |
| PERT | MJ | 1.44E+01 | 2.61E-01 | 2.25E+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 | 5.57E-03 | 0.00E+00 | 1.32E-02 | 0.00E+00 |
| PENRE | MJ | 5.66E+01 | 1.72E+00 | 8.94E+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 | 3.80E-02 | 0.00E+00 | 1.31E-01 | 0.00E+00 |
| PENRM | MJ. | 6.80E+01 | 1.39E+01 | 1.06E+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 | 3.60E-01 | 0.00E+00 | 1.42E+00 | 0.00E+00 |
| PENRT | MJ | 1.25E+02 | 1.56E+01 | 1.95E+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 | 3.98E-01 | 0.00E+00 | 1.55E+00 | 0.00E+00 |
| SM | kg | 6.80E+00 | 1.90E-02 | 1.03E+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 | 3.99E-04 | 0.00E+00 | 8.34E-04 | 0.00E+00 |
| RSF | MJ | 8.81E-02 | 5.79E-03 | 1.64E-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 | 1.19E-04 | 0.00E+00 | 1.47E-04 | 0.00E+00 |
| NRSF | MJ | 8.55E-02 | 2.51E-02 | 1.51E-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 | 4.83E-04 | 0.00E+00 | 2.12E-04 | 0.00E+00 |
| FW | $m^3$ | 1.62E-01 | 2.00E-03 | 2.50E-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 | 4.51E-05 | 0.00E+00 | 1.67E-03 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 3.48E+00 | 4.07E-01 | 6.31E-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 | 8.75E-03 | 0.00E+00 | 2.55E-02 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 9.73E-01 | 6.47E-01 | 1.73E+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 | 2.02E-02 | 0.00E+00 | 1.05E+01 | 0.00E+00 |
| Radioactive waste disposed | kg | 3.70E-03 | 3.46E-04 | 6.88E-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 | 7.87E-06 | 0.00E+00 | 1.96E-05 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 1.54E-01 | 1.61E-02 | 2.85E-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 | 3.32E-04 | 0.00E+00 | 5.30E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 7.86E-03 | 4.20E-03 | 1.27E-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 | 9.14E-05 | 0.00E+00 | 2.94E-04 | 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, thermal | 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 |

# Information on biogenic carbon content

### Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.595 |

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

Results for 1m² of glass wool insulation with a thickness of 320 mm and thermal resistance of 9.40 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-fossil | kg $CO_2$ eq. | 5.27E+00 | 1.10E+00 | 8.25E-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 | 2.77E-02 | 0.00E+00 | 5.90E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -5.76E-01 | 2.26E-03 | -8.56E-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 | 4.90E-05 | 0.00E+00 | 1.69E-04 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 6.26E-03 | 5.19E-04 | 1.00E-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 | 1.10E-05 | 0.00E+00 | 5.45E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 4.70E+00 | 1.11E+00 | 7.41E-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 | 2.77E-02 | 0.00E+00 | 5.92E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 7.82E-07 | 2.48E-07 | 1.23E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.46E-09 | 0.00E+00 | 2.39E-08 | 0.00E+00 |
| AP | mol $H^+$ eq. | 2.88E-02 | 4.39E-03 | 4.54E-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 | 1.40E-04 | 0.00E+00 | 5.54E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 7.21E-03 | 2.56E-04 | 1.15E-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 | 5.56E-06 | 0.00E+00 | 1.67E-05 | 0.00E+00 |
| EP-freshwater | kg P eq. | 2.35E-03 | 8.34E-05 | 3.76E-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 | 1.81E-06 | 0.00E+00 | 5.45E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 5.46E-03 | 1.28E-03 | 8.76E-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 | 4.83E-05 | 0.00E+00 | 1.93E-04 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 6.52E-02 | 1.39E-02 | 1.04E-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 | 5.28E-04 | 0.00E+00 | 2.11E-03 | 0.00E+00 |
| POCP | kg NMVOC eq. | 1.79E-02 | 4.19E-03 | 2.84E-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 | 1.48E-04 | 0.00E+00 | 5.99E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 1.34E-03 | 4.83E-06 | 2.01E-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 | 9.32E-08 | 0.00E+00 | 1.27E-07 | 0.00E+00 |
| ADP-fossil* | MJ | 4.81E+01 | 1.42E+00 | 7.47E+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 | 3.17E-02 | 0.00E+00 | 1.23E-01 | 0.00E+00 |
| WDP* | $m^3$ | 7.42E+00 | 8.94E-02 | 1.14E+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 | 2.02E-03 | 0.00E+00 | 7.58E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[14] | kg $CO_2$ eq. | 5.11E+00 | 1.09E+00 | 8.02E-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 | 2.74E-02 | 0.00E+00 | 5.79E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 4.30E+00 | 2.08E-01 | 7.29E-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 | 4.47E-03 | 0.00E+00 | 9.53E-03 | 0.00E+00 |
| PERM | MJ | 1.10E+01 | 7.05E-02 | 1.67E+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 | 1.47E-03 | 0.00E+00 | 4.51E-03 | 0.00E+00 |
| PERT | MJ | 1.53E+01 | 2.78E-01 | 2.40E+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 | 5.94E-03 | 0.00E+00 | 1.40E-02 | 0.00E+00 |
| PENRE | MJ | 6.04E+01 | 1.83E+00 | 9.53E+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 | 4.05E-02 | 0.00E+00 | 1.40E-01 | 0.00E+00 |
| PENRM | MJ. | 7.23E+01 | 1.48E+01 | 1.12E+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 | 3.84E-01 | 0.00E+00 | 1.52E+00 | 0.00E+00 |
| PENRT | MJ | 1.33E+02 | 1.67E+01 | 2.08E+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 | 4.24E-01 | 0.00E+00 | 1.66E+00 | 0.00E+00 |
| SM | kg | 7.25E+00 | 2.02E-02 | 1.09E+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 | 4.26E-04 | 0.00E+00 | 8.90E-04 | 0.00E+00 |
| RSF | MJ | 9.39E-02 | 6.18E-03 | 1.74E-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 | 1.27E-04 | 0.00E+00 | 1.56E-04 | 0.00E+00 |
| NRSF | MJ | 9.06E-02 | 2.68E-02 | 1.60E-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 | 5.15E-04 | 0.00E+00 | 2.26E-04 | 0.00E+00 |
| FW | $m^3$ | 1.73E-01 | 2.13E-03 | 2.67E-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 | 4.81E-05 | 0.00E+00 | 1.78E-03 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 3.70E+00 | 4.34E-01 | 6.72E-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 | 9.33E-03 | 0.00E+00 | 2.72E-02 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 9.83E-01 | 6.90E-01 | 1.83E+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 | 2.15E-02 | 0.00E+00 | 1.12E+01 | 0.00E+00 |
| Radioactive waste disposed | kg | 3.94E-03 | 3.69E-04 | 7.33E-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 | 8.39E-06 | 0.00E+00 | 2.09E-05 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 1.64E-01 | 1.71E-02 | 3.03E-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 | 3.54E-04 | 0.00E+00 | 5.66E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 8.29E-03 | 4.48E-03 | 1.34E-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 | 9.75E-05 | 0.00E+00 | 3.13E-04 | 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, thermal | 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 |

# Information on biogenic carbon content

### Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.634 |

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

Results for 1m² of glass wool insulation with a thickness of 340 mm and thermal resistance of 10 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-fossil | kg $CO_2$ eq. | 5.58E+00 | 1.17E+00 | 8.74E-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 | 2.94E-02 | 0.00E+00 | 6.26E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -6.14E-01 | 2.40E-03 | -9.12E-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 | 5.20E-05 | 0.00E+00 | 1.79E-04 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 6.64E-03 | 5.51E-04 | 1.06E-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 | 1.17E-05 | 0.00E+00 | 5.79E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 4.97E+00 | 1.18E+00 | 7.84E-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 | 2.95E-02 | 0.00E+00 | 6.29E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 8.26E-07 | 2.64E-07 | 1.30E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.86E-09 | 0.00E+00 | 2.53E-08 | 0.00E+00 |
| AP | mol $H^+$ eq. | 3.05E-02 | 4.66E-03 | 4.82E-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 | 1.49E-04 | 0.00E+00 | 5.89E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 7.65E-03 | 2.72E-04 | 1.22E-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 | 5.91E-06 | 0.00E+00 | 1.78E-05 | 0.00E+00 |
| EP-freshwater | kg P eq. | 2.49E-03 | 8.86E-05 | 3.99E-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 | 1.92E-06 | 0.00E+00 | 5.79E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 5.77E-03 | 1.36E-03 | 9.27E-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 | 5.13E-05 | 0.00E+00 | 2.05E-04 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 6.90E-02 | 1.48E-02 | 1.10E-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 | 5.61E-04 | 0.00E+00 | 2.24E-03 | 0.00E+00 |
| POCP | kg NMVOC eq. | 1.89E-02 | 4.46E-03 | 3.01E-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 | 1.57E-04 | 0.00E+00 | 6.37E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 1.42E-03 | 5.13E-06 | 2.14E-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 | 9.90E-08 | 0.00E+00 | 1.35E-07 | 0.00E+00 |
| ADP-fossil* | MJ | 5.11E+01 | 1.51E+00 | 7.93E+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 | 3.37E-02 | 0.00E+00 | 1.31E-01 | 0.00E+00 |
| WDP* | $m^3$ | 7.88E+00 | 9.50E-02 | 1.21E+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 | 2.15E-03 | 0.00E+00 | 8.06E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[15] | kg $CO_2$ eq. | 5.41E+00 | 1.16E+00 | 8.48E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.92E-02 | 0.00E+00 | 6.15E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 4.56E+00 | 2.20E-01 | 7.74E-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 | 4.75E-03 | 0.00E+00 | 1.01E-02 | 0.00E+00 |
| PERM | MJ | 1.17E+01 | 7.49E-02 | 1.78E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.56E-03 | 0.00E+00 | 4.79E-03 | 0.00E+00 |
| PERT | MJ | 1.63E+01 | 2.95E-01 | 2.55E+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 | 6.31E-03 | 0.00E+00 | 1.49E-02 | 0.00E+00 |
| PENRE | MJ | 6.41E+01 | 1.95E+00 | 1.01E+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 | 4.30E-02 | 0.00E+00 | 1.49E-01 | 0.00E+00 |
| PENRM | MJ. | 7.65E+01 | 1.57E+01 | 1.19E+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 | 4.08E-01 | 0.00E+00 | 1.61E+00 | 0.00E+00 |
| PENRT | MJ | 1.41E+02 | 1.77E+01 | 2.20E+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 | 4.51E-01 | 0.00E+00 | 1.76E+00 | 0.00E+00 |
| SM | kg | 7.70E+00 | 2.15E-02 | 1.16E+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 | 4.53E-04 | 0.00E+00 | 9.45E-04 | 0.00E+00 |
| RSF | MJ | 9.96E-02 | 6.56E-03 | 1.85E-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 | 1.35E-04 | 0.00E+00 | 1.66E-04 | 0.00E+00 |
| NRSF | MJ | 9.57E-02 | 2.85E-02 | 1.69E-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 | 5.47E-04 | 0.00E+00 | 2.40E-04 | 0.00E+00 |
| FW | $m^3$ | 1.84E-01 | 2.26E-03 | 2.83E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.11E-05 | 0.00E+00 | 1.89E-03 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 3.92E+00 | 4.61E-01 | 7.12E-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 | 9.91E-03 | 0.00E+00 | 2.89E-02 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 9.94E-01 | 7.33E-01 | 1.94E+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 | 2.29E-02 | 0.00E+00 | 1.19E+01 | 0.00E+00 |
| Radioactive waste disposed | kg | 4.18E-03 | 3.92E-04 | 7.78E-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 | 8.92E-06 | 0.00E+00 | 2.22E-05 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 1.74E-01 | 1.82E-02 | 3.22E-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 | 3.76E-04 | 0.00E+00 | 6.01E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 8.72E-03 | 4.76E-03 | 1.41E-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 | 1.04E-04 | 0.00E+00 | 3.33E-04 | 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, thermal | 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 |

# Information on biogenic carbon content

### Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.674 |

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

Results for 1m² of glass wool insulation with a thickness of 360 mm and thermal resistance of 10.55 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-fossil | kg $CO_2$ eq. | 5.88E+00 | 1.24E+00 | 9.22E-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 | 3.11E-02 | 0.00E+00 | 6.63E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -6.46E-01 | 2.55E-03 | -9.59E-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 | 5.51E-05 | 0.00E+00 | 1.90E-04 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 7.01E-03 | 5.83E-04 | 1.12E-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 | 1.23E-05 | 0.00E+00 | 6.13E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 5.25E+00 | 1.25E+00 | 8.27E-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 | 3.12E-02 | 0.00E+00 | 6.66E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 8.70E-07 | 2.79E-07 | 1.37E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.26E-09 | 0.00E+00 | 2.68E-08 | 0.00E+00 |
| AP | mol $H^+$ eq. | 3.22E-02 | 4.93E-03 | 5.09E-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 | 1.58E-04 | 0.00E+00 | 6.24E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 8.10E-03 | 2.88E-04 | 1.30E-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 | 6.25E-06 | 0.00E+00 | 1.88E-05 | 0.00E+00 |
| EP-freshwater | kg P eq. | 2.64E-03 | 9.39E-05 | 4.22E-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 | 2.04E-06 | 0.00E+00 | 6.13E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 6.09E-03 | 1.44E-03 | 9.78E-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 | 5.44E-05 | 0.00E+00 | 2.17E-04 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 7.27E-02 | 1.57E-02 | 1.16E-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 | 5.94E-04 | 0.00E+00 | 2.37E-03 | 0.00E+00 |
| POCP | kg NMVOC eq. | 1.99E-02 | 4.72E-03 | 3.17E-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 | 1.67E-04 | 0.00E+00 | 6.74E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 1.51E-03 | 5.43E-06 | 2.26E-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 | 1.05E-07 | 0.00E+00 | 1.43E-07 | 0.00E+00 |
| ADP-fossil* | MJ | 5.41E+01 | 1.60E+00 | 8.39E+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 | 3.57E-02 | 0.00E+00 | 1.39E-01 | 0.00E+00 |
| WDP* | $m^3$ | 8.34E+00 | 1.01E-01 | 1.28E+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 | 2.27E-03 | 0.00E+00 | 8.53E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[16] | kg $CO_2$ eq. | 5.71E+00 | 1.23E+00 | 8.95E-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 | 3.09E-02 | 0.00E+00 | 6.51E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 4.83E+00 | 2.33E-01 | 8.19E-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 | 5.03E-03 | 0.00E+00 | 1.07E-02 | 0.00E+00 |
| PERM | MJ | 1.24E+01 | 7.94E-02 | 1.87E+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 | 1.65E-03 | 0.00E+00 | 5.07E-03 | 0.00E+00 |
| PERT | MJ | 1.72E+01 | 3.13E-01 | 2.69E+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 | 6.68E-03 | 0.00E+00 | 1.58E-02 | 0.00E+00 |
| PENRE | MJ | 6.78E+01 | 2.06E+00 | 1.07E+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 | 4.56E-02 | 0.00E+00 | 1.57E-01 | 0.00E+00 |
| PENRM | MJ. | 8.07E+01 | 1.67E+01 | 1.26E+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 | 4.32E-01 | 0.00E+00 | 1.71E+00 | 0.00E+00 |
| PENRT | MJ | 1.49E+02 | 1.87E+01 | 2.33E+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 | 4.77E-01 | 0.00E+00 | 1.86E+00 | 0.00E+00 |
| SM | kg | 8.16E+00 | 2.28E-02 | 1.23E+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 | 4.79E-04 | 0.00E+00 | 1.00E-03 | 0.00E+00 |
| RSF | MJ | 1.05E-01 | 6.95E-03 | 1.96E-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 | 1.43E-04 | 0.00E+00 | 1.76E-04 | 0.00E+00 |
| NRSF | MJ | 1.01E-01 | 3.02E-02 | 1.78E-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 | 5.79E-04 | 0.00E+00 | 2.54E-04 | 0.00E+00 |
| FW | $m^3$ | 1.95E-01 | 2.40E-03 | 3.00E-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 | 5.41E-05 | 0.00E+00 | 2.00E-03 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 4.15E+00 | 4.88E-01 | 7.53E-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 | 1.05E-02 | 0.00E+00 | 3.06E-02 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 1.00E+00 | 7.77E-01 | 2.05E+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 | 2.42E-02 | 0.00E+00 | 1.26E+01 | 0.00E+00 |
| Radioactive waste disposed | kg | 4.41E-03 | 4.15E-04 | 8.22E-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 | 9.44E-06 | 0.00E+00 | 2.35E-05 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 1.84E-01 | 1.93E-02 | 3.40E-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 | 3.98E-04 | 0.00E+00 | 6.37E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 9.13E-03 | 5.04E-03 | 1.47E-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 | 1.10E-04 | 0.00E+00 | 3.52E-04 | 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, thermal | 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 |

# Information on biogenic carbon content

### Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.714 |

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

Results for 1m² of glass wool insulation with a thickness of 380 mm and thermal resistance of 11.15 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-fossil | kg $CO_2$ eq. | 6.19E+00 | 1.31E+00 | 9.70E-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-02 | 0.00E+00 | 7.00E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -6.82E-01 | 2.69E-03 | -1.01E-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 | 5.82E-05 | 0.00E+00 | 2.00E-04 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 7.39E-03 | 6.16E-04 | 1.18E-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 | 1.30E-05 | 0.00E+00 | 6.47E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 5.52E+00 | 1.31E+00 | 8.70E-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-02 | 0.00E+00 | 7.03E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 9.14E-07 | 2.95E-07 | 1.44E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.67E-09 | 0.00E+00 | 2.83E-08 | 0.00E+00 |
| AP | mol $H^+$ eq. | 3.39E-02 | 5.21E-03 | 5.36E-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 | 1.66E-04 | 0.00E+00 | 6.58E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 8.54E-03 | 3.04E-04 | 1.37E-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 | 6.60E-06 | 0.00E+00 | 1.99E-05 | 0.00E+00 |
| EP-freshwater | kg P eq. | 2.78E-03 | 9.91E-05 | 4.45E-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 | 2.15E-06 | 0.00E+00 | 6.47E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 6.40E-03 | 1.52E-03 | 1.03E-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 | 5.74E-05 | 0.00E+00 | 2.29E-04 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 7.65E-02 | 1.66E-02 | 1.22E-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 | 6.27E-04 | 0.00E+00 | 2.51E-03 | 0.00E+00 |
| POCP | kg NMVOC eq. | 2.10E-02 | 4.98E-03 | 3.34E-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 | 1.76E-04 | 0.00E+00 | 7.12E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 1.59E-03 | 5.74E-06 | 2.39E-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 | 1.11E-07 | 0.00E+00 | 1.51E-07 | 0.00E+00 |
| ADP-fossil* | MJ | 5.71E+01 | 1.68E+00 | 8.86E+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 | 3.77E-02 | 0.00E+00 | 1.47E-01 | 0.00E+00 |
| WDP* | $m^3$ | 8.80E+00 | 1.06E-01 | 1.35E+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 | 2.40E-03 | 0.00E+00 | 9.00E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[17] | kg $CO_2$ eq. | 6.01E+00 | 1.30E+00 | 9.42E-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 | 3.26E-02 | 0.00E+00 | 6.88E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 5.09E+00 | 2.46E-01 | 8.64E-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 | 5.31E-03 | 0.00E+00 | 1.13E-02 | 0.00E+00 |
| PERM | MJ | 1.31E+01 | 8.38E-02 | 1.98E+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 | 1.74E-03 | 0.00E+00 | 5.35E-03 | 0.00E+00 |
| PERT | MJ | 1.82E+01 | 3.30E-01 | 2.84E+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 | 7.06E-03 | 0.00E+00 | 1.67E-02 | 0.00E+00 |
| PENRE | MJ | 7.16E+01 | 2.18E+00 | 1.13E+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 | 4.81E-02 | 0.00E+00 | 1.66E-01 | 0.00E+00 |
| PENRM | MJ. | 8.50E+01 | 1.76E+01 | 1.32E+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 | 4.56E-01 | 0.00E+00 | 1.80E+00 | 0.00E+00 |
| PENRT | MJ | 1.57E+02 | 1.98E+01 | 2.45E+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 | 5.04E-01 | 0.00E+00 | 1.97E+00 | 0.00E+00 |
| SM | kg | 8.61E+00 | 2.40E-02 | 1.30E+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 | 5.06E-04 | 0.00E+00 | 1.06E-03 | 0.00E+00 |
| RSF | MJ | 1.11E-01 | 7.33E-03 | 2.07E-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 | 1.51E-04 | 0.00E+00 | 1.86E-04 | 0.00E+00 |
| NRSF | MJ | 1.06E-01 | 3.19E-02 | 1.87E-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 | 6.11E-04 | 0.00E+00 | 2.68E-04 | 0.00E+00 |
| FW | $m^3$ | 2.06E-01 | 2.53E-03 | 3.16E-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 | 5.71E-05 | 0.00E+00 | 2.11E-03 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 4.37E+00 | 5.15E-01 | 7.94E-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 | 1.11E-02 | 0.00E+00 | 3.23E-02 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 1.01E+00 | 8.20E-01 | 2.15E+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 | 2.56E-02 | 0.00E+00 | 1.33E+01 | 0.00E+00 |
| Radioactive waste disposed | kg | 4.65E-03 | 4.38E-04 | 8.67E-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 | 9.97E-06 | 0.00E+00 | 2.48E-05 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 1.94E-01 | 2.04E-02 | 3.58E-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 | 4.20E-04 | 0.00E+00 | 6.72E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 9.56E-03 | 5.32E-03 | 1.54E-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 | 1.16E-04 | 0.00E+00 | 3.72E-04 | 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, thermal | 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 |

# Information on biogenic carbon content

### Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.753 |

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

Results for 1m² of glass wool insulation with a thickness of 400 mm and thermal resistance of 11.75 $m^2 \cdot K/W$:

## Potential environmental impact – mandatory indicators according to EN 15804

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-fossil | kg $CO_2$ eq. | 6.50E+00 | 1.38E+00 | 1.02E+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 | 3.46E-02 | 0.00E+00 | 7.37E-02 | 0.00E+00 |
| GWP-biogenic | kg $CO_2$ eq. | -7.16E-01 | 2.83E-03 | -1.06E-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 | 6.12E-05 | 0.00E+00 | 2.11E-04 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 7.77E-03 | 6.48E-04 | 1.24E-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 | 1.37E-05 | 0.00E+00 | 6.81E-05 | 0.00E+00 |
| GWP-total | kg $CO_2$ eq. | 5.79E+00 | 1.38E+00 | 9.14E-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 | 3.47E-02 | 0.00E+00 | 7.40E-02 | 0.00E+00 |
| ODP | kg CFC 11 eq. | 9.58E-07 | 3.10E-07 | 1.51E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.07E-09 | 0.00E+00 | 2.98E-08 | 0.00E+00 |
| AP | mol $H^+$ eq. | 3.56E-02 | 5.48E-03 | 5.63E-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 | 1.75E-04 | 0.00E+00 | 6.93E-04 | 0.00E+00 |
| EP-freshwater | kg $PO_4^{3-}$ eq. | 8.99E-03 | 3.20E-04 | 1.44E-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 | 6.95E-06 | 0.00E+00 | 2.09E-05 | 0.00E+00 |
| EP-freshwater | kg P eq. | 2.93E-03 | 1.04E-04 | 4.69E-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 | 2.26E-06 | 0.00E+00 | 6.81E-06 | 0.00E+00 |
| EP-marine | kg N eq. | 6.72E-03 | 1.60E-03 | 1.08E-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 | 6.04E-05 | 0.00E+00 | 2.41E-04 | 0.00E+00 |
| EP-terrestrial | mol N eq. | 8.03E-02 | 1.74E-02 | 1.28E-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 | 6.60E-04 | 0.00E+00 | 2.64E-03 | 0.00E+00 |
| POCP | kg NMVOC eq. | 2.20E-02 | 5.24E-03 | 3.50E-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 | 1.85E-04 | 0.00E+00 | 7.49E-04 | 0.00E+00 |
| ADP-minerals&metals* | kg Sb eq. | 1.67E-03 | 6.04E-06 | 2.51E-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 | 1.16E-07 | 0.00E+00 | 1.59E-07 | 0.00E+00 |
| ADP-fossil* | MJ | 6.00E+01 | 1.77E+00 | 9.32E+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 | 3.97E-02 | 0.00E+00 | 1.54E-01 | 0.00E+00 |
| WDP* | $m^3$ | 9.27E+00 | 1.12E-01 | 1.43E+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 | 2.52E-03 | 0.00E+00 | 9.48E-02 | 0.00E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Potential environmental impact – additional mandatory and voluntary indicators

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| GWP-GHG[18] | kg $CO_2$ eq. | 6.30E+00 | 1.37E+00 | 9.89E-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 | 3.43E-02 | 0.00E+00 | 7.24E-02 | 0.00E+00 |

## Use of resources

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| PERE | MJ | 5.36E+00 | 2.59E-01 | 9.09E-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 | 5.59E-03 | 0.00E+00 | 1.19E-02 | 0.00E+00 |
| PERM | MJ | 1.37E+01 | 8.82E-02 | 2.08E+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 | 1.83E-03 | 0.00E+00 | 5.63E-03 | 0.00E+00 |
| PERT | MJ | 1.91E+01 | 3.48E-01 | 2.98E+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 | 7.43E-03 | 0.00E+00 | 1.75E-02 | 0.00E+00 |
| PENRE | MJ | 7.53E+01 | 2.29E+00 | 1.19E+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 | 5.06E-02 | 0.00E+00 | 1.75E-01 | 0.00E+00 |
| PENRM | MJ. | 8.92E+01 | 1.85E+01 | 1.39E+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 | 4.80E-01 | 0.00E+00 | 1.90E+00 | 0.00E+00 |
| PENRT | MJ | 1.65E+02 | 2.08E+01 | 2.58E+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 | 5.30E-01 | 0.00E+00 | 2.07E+00 | 0.00E+00 |
| SM | kg | 9.06E+00 | 2.53E-02 | 1.37E+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 | 5.33E-04 | 0.00E+00 | 1.11E-03 | 0.00E+00 |
| RSF | MJ | 1.17E-01 | 7.72E-03 | 2.17E-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 | 1.59E-04 | 0.00E+00 | 1.96E-04 | 0.00E+00 |
| NRSF | MJ | 1.11E-01 | 3.35E-02 | 1.96E-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 | 6.44E-04 | 0.00E+00 | 2.82E-04 | 0.00E+00 |
| FW | $m^3$ | 2.16E-01 | 2.66E-03 | 3.33E-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-05 | 0.00E+00 | 2.22E-03 | 0.00E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | | |

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

# Waste production and output flows

## Waste production

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| Hazardous waste disposed | kg | 4.59E+00 | 5.42E-01 | 8.34E-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 | 1.17E-02 | 0.00E+00 | 3.40E-02 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 1.03E+00 | 8.63E-01 | 2.26E+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 | 2.69E-02 | 0.00E+00 | 1.40E+01 | 0.00E+00 |
| Radioactive waste disposed | kg | 4.89E-03 | 4.61E-04 | 9.11E-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 | 1.05E-05 | 0.00E+00 | 2.61E-05 | 0.00E+00 |

## Output flows

### Results per functional or declared unit

| | | Production phase | Construction phase | | Use phase | | | | | | | End of life phase | | | | D Benefits and loads beyond the limits of the system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | Unit | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Energy use | B7 Use of water | C1 Deconstruction / demolition | C2 Transport | C3 Waste treatment | C4 Removal | |
| 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 |
| Material for recycling | kg | 2.04E-01 | 2.14E-02 | 3.77E-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 | 4.42E-04 | 0.00E+00 | 7.07E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 9.97E-03 | 5.60E-03 | 1.61E-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 | 1.22E-04 | 0.00E+00 | 3.91E-04 | 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, thermal | 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 |

# Information on biogenic carbon content

### Results per functional or declared unit

| BIOGENIC CARBON CONTENT | Unit | QUANTITY |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in packaging | kg C | 0.793 |

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

# 6. Additional Information

**Emissions in the indoor air:**

URSA WBW: PUREONE PURE FLOC, PURE FLOC, PUREONE PURE FLOC KD, PURE FLOC KD, WBWPF comply with Indoor Air Comfort Gold requirements for products type, version 7.0 (2020). These include both inspections of factory production according to DIN 18200 and VOC testing according to EN 16516 by an ISO 17025 accredited laboratory, at regular interval.

Indoor Air COMFORT Gold Certification ensures that low product emission requirements are fulfilled and is a sign of the applicant´s focus on quality and contribution to a healthy indoor environment.

Certificate number: IACG-451-01-01-2022

Compliance with Indoor Air Comfort means compliance with VOC requirements on low emitting products of:
France VOC class A+, Germany (AgBB/ABG), BREEAM international, BREAM NOR, BREAM NL, LEED (ACP), WELL Building, SKA Rating, French HQE certification, Italian CAM Edilizia, BVB (Sweden), Eco Product Norway, DGNB, Blue Angel DE-UZ 132, M1, Danish Indoor Climate Label (Emission Class 1), very low emitting products according to EN 16798-1, Singapore Green Label, GreenTag Australia.

**EUCEB:**

Mineral wool fibers have been exempted from carcinogenic classification according to: Regulation on classification and labelling of substances and mixtures Regulation (EC) n° 1272/2008 and its last update Regulation (EU) nº 2021/643. They have in fact successfully passed the tests established by this Regulation and their biopersistance is lower than the values defined in note « Q » of this text. This exemption is certified by the European CErtification Board (EUCEB - www.euceb.org).

The EUCEB certifies that fibers conform to note « Q » of the Regulation (EC) n° 1272/2008. The EUCEB guarantees that the exemption tests have been executed in conformance with European protocols, that industrial entities have control procedures in place during manufacture of the products, and that third parties inspect and approve the results.

The industrial entities in respect of EUCEB undertake as follows:

- To provide a test report compiled by a EUCEB recognized laboratory providing proof that the fibers satisfy one of the four exemption conditions established in note « Q » of Regulation (EC) n° 1272/2008,
- Twice yearly, to undergo production inspection by an independent third party recognized by EUCEB (sample taking and conformance with initial chemical analysis),

- To set up internal control procedures in each factory.

The products with this certification are recognizable as they have the EUCEB logo affixed to their packaging

**REACH:**

**Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).**

The glass wool products (rolls and boards) manufactured by URSA are defined as "articles" according to the article 3 (3) of EC Regulation 1907/2006 (REACH). Articles, whose functionality is more determinate by the shape, surface or design given in their production process, than by its chemical composition.

There, according to Art. 2 of EC Regulation 1907/2006 (REACH) our articles are excluded from the EC Regulation 1907/2006 (REACH).

Our products do not contain Substances of Very High Concern (SVHC) in a higher concentration than 0,01 % by weight according to the last update of the candidate list know at the date this document was issued.

ECHA-European Chemicals Agency regularly published an update SHVC list. The validity of this statement is therefore of ECHA new publications.

**Circular Economy:**

**Recycled Glass Content:**

According to ISO 14021:

1) Recycled Content is a Proportion, by mass, of recycled material in a product. *Only pre-consumer and post-consumer materials shall be considered as recycled content, consistent with the following use of terms,*

Pre-consumer material: Material diverted from waste stream during a manufacturing process. Excluded is reutilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.

Post-consumer material: Material generated by households or by commercial, industrial, and institutional facilities in their role as end-users of the product which can no longer be used for its intended purpose. This includes returns of materials from the distribution chain.

2) Recovered material: Material that would have otherwise been disposed of a waste or used for energy recovery but has instead been collected and

recovered as a material input, in lieu of new primary material, for a recycling or a manufacturing process.

For the Desselgem plant, in the year 2022:

| Products | % Recovered material | % Recycled content (According to 14021) | | | % Total recycled |
|---|---|---|---|---|---|
| | | Pre-consumer | Post-consumer | % Total | |
| URSA WBW: PUREONE PURE FLOC, PURE FLOC, PUREONE PURE FLOC KD, PURE FLOC KD, WBWPF | 13 | 0 | 50 | 50 | 63 |

***Sorting info label for the packging***

The Article 17 of the French AGEC Law and Decree no. 2021-835 of 29 June 2021, says that a new mandatory harmonised sorting label to the household packaging should be implemented to contribute to recycling and circular economy. The aim is to provide consumers with the information they need and ensure that the producers are in compliance with the new regulatory requirements.

***European Waste Codes***

Waste glass wool in the module A5 and C will be classified according to the European Waste Codes:

17 06 04 insulation materials other than those mentioned in 17 06 01 and 17 06 03

## 7. References

- ISO 14040:2006 Environmental management — Life cycle assessment — Principles and framework

- ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines

- EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

- PCR 2019:14. Construction products (EN 15804+A2) Version 1.11. C-PCR-005 Thermal insulation products (EN 16783:2017) Version: 2019-12-20

- General Programme Instructions of the International EPD® System. Version 3.01.

- LCA Report (Version 3 – 30.06.2022)