

# Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Geniox (R-HW-Optimized)



The Norwegian EPD Foundation

**Owner of the declaration:**

Systemair AS

**Product:**

Geniox (R-HW-Optimized)

**Declared unit:**

1 pcs

**This declaration is based on Product Category Rules:**

CEN Standard EN 15804:2012+A2:2019 serves as core PCR

NPCR 030:2021 Part B for ventilation components

**Program operator:**

The Norwegian EPD Foundation

**Declaration number:**

NEPD-6769-6090-EN

**Registration number:**

NEPD-6769-6090-EN

**Issue date:** 06.06.2024

**Valid to:** 06.06.2029

**EPD software:**

LCAno EPD generator ID: 347567

## General information

### Product

Geniox (R-HW-Optimized)

### Program operator:

The Norwegian EPD Foundation  
Post Box 5250 Majorstuen, 0303 Oslo, Norway  
Phone: +47 977 22 020  
web: [www.epd-norge.no](http://www.epd-norge.no)

### Declaration number:

NEPD-6769-6090-EN

### This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR  
NPCR 030:2021 Part B for ventilation components

### Statement of liability:

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

### Declared unit:

1 pcs Geniox (R-HW-Optimized)

### Declared unit with option:

A1-A3,A4,C1,C2,C3,C4,D

### Functional unit:

Not declared.

### General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

### Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Alexander Borg, Asplan Viak AS

(no signature required)

### Owner of the declaration:

Systemair AS  
Contact person: Øyvind Johannessen  
Phone: +4751969700  
e-mail: [mailbox@systemair.no](mailto:mailbox@systemair.no)

### Manufacturer:

Systemair AS  
Luramyrveien 38  
4313 Sandnes, Norway

### Place of production:

Systemair AS - Dal  
Industriveien 83  
NO-2072 Dal, Norway

### Management system:

ISO 9001

### Organisation no:

929 387 384

### Issue date:

06.06.2024

### Valid to:

06.06.2029

### Year of study:

2023

### Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

### Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system and has been approved by EPD Norway. NEPDT46 VKEs EPD-generator

Developer of EPD: Michael Valstad

Reviewer of company-specific input data and EPD: Øyvind Johannessen

### Approved:



Håkon Hauan  
Managing Director of EPD-Norway

## Product

### Product description:

Geniox air handling unit with rotary heat exchanger, integrated controls, dampers and hydronic heater. For use in ordinary comfort ventilation.

### Product specification

Geniox air handling units range from size 11 to 31, with capacities from approximately 2 000 m<sup>3</sup>/h to 35 000 m<sup>3</sup>/h.

The EPD data is provided for size 18 (reference).

| Materials                                       | kg             | %             |
|---|----------------|---------------|
| Adhesive  | 2,88           | 0,24          |
| Chemical  | 0,32           | 0,03          |
| Electronic - Unspecified                        | 8,68           | 0,73          |
| Filter, plastic based                           | 0,16           | 0,01          |
| Glass fibre reinforced plastic, polyamide       | 62,15          | 5,26          |
| Hydronic coil (50% AL, 50%CU)                   | 29,00          | 2,45          |
| Insulation, Mineral based                       | 15,99          | 1,35          |
| Metal - Aluminium                               | 164,20         | 13,89         |
| Metal - Copper                                  | 2,00           | 0,17          |
| Metal - Galvanized Steel                        | 121,63         | 10,29         |
| Metal - Steel                                   | 8,14           | 0,69          |
| Metal - Steel with aluzinc coating              | 0,66           | 0,06          |
| Metal - Steel with magnelis coating             | 652,01         | 55,17         |
| Motor   | 45,00          | 3,81          |
| Other   | 0,30           | 0,03          |
| Plastic - Acrylonitrile butadiene styrene (ABS) | 17,88          | 1,51          |
| Plastic - Polyamide                             | 5,23           | 0,44          |
| Plastic - Polycarbonate (PC)                    | 0,50           | 0,04          |
| Plastic - Polyethylene                          | 0,11           | 0,01          |
| Plastic - Polyethylene (HDPE)                   | 0,60           | 0,05          |
| Plastic - Polypropylene (PP)                    | 1,10           | 0,09          |
| Plastic - Polyvinyl chloride (PVC)              | 29,72          | 2,51          |
| Plastics  | 1,75           | 0,15          |
| Rubber, synthetic                               | 11,83          | 1,00          |
| <b>Total</b>                                    | <b>1181,84</b> | <b>100,00</b> |

| Packaging                    | kg             | %             |
|------------------------------|----------------|---------------|
| Packaging - Paper            | 0,20           | 4,61          |
| Packaging - Plastic          | 4,14           | 95,39         |
| <b>Total incl. packaging</b> | <b>1186,18</b> | <b>100,00</b> |

### Technical data:

Casing performance in accordance with EN 1886:2007:

- Air leakage class L1(M)
- Thermal bridging class TB2
- Thermal transmittance class T2
- Mechanical strength class D1

ZM310 coated steel panels with 60 mm insulation. Corrosion resistance class C5 in accordance with ISO 12944-2:2017.

Energy performance must be calculated using realistic project specific operating conditions. Complete and project specific product specification including all relevant technical data and energy performance can be generated using our AHU calculation software, SystemairCAD. Please refer to the Systemair website for more information.

Geniox is Eurovent certified.

The composition of materials is the same for all sizes, and the ratio of materials is almost equal among the sizes. Key EPD data for the full range is provided in the following table, including suggested conversion factors.

Size specific EPDs are also available upon request.

| Size | Weight [kg] | GWPotot (A1-A3) [kg CO2 eq] | Factor [-] |
|------|-------------|-----------------------------|------------|
| 11   | 633,62      | 3645,94                     | 0,558      |
| 12   | 739,34      | 4157,04                     | 0,636      |
| 14   | 847,08      | 4766,72                     | 0,730      |
| 16   | 1011,38     | 5608,70                     | 0,858      |
| 18   | 1186,18     | 6533,94                     | 1,000      |
| 20   | 1581,01     | 8350,18                     | 1,278      |
| 22   | 1900,92     | 9968,05                     | 1,526      |
| 24   | 2216,48     | 11486,04                    | 1,758      |
| 27   | 2717,30     | 13685,74                    | 2,095      |
| 29   | 3137,59     | 15632,20                    | 2,392      |
| 31   | 3609,91     | 17968,34                    | 2,750      |

#### Market:

Norway.

#### Reference service life, product

Determined by the application of the product.

#### Reference service life, building or construction works

Not declared.

### LCA: Calculation rules

#### Declared unit:

1 pcs Geniox (R-HW-Optimized)

#### Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

#### Allocation:

The allocation is made in accordance with the provisions of EN 15804. Energy, water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

#### Data quality:

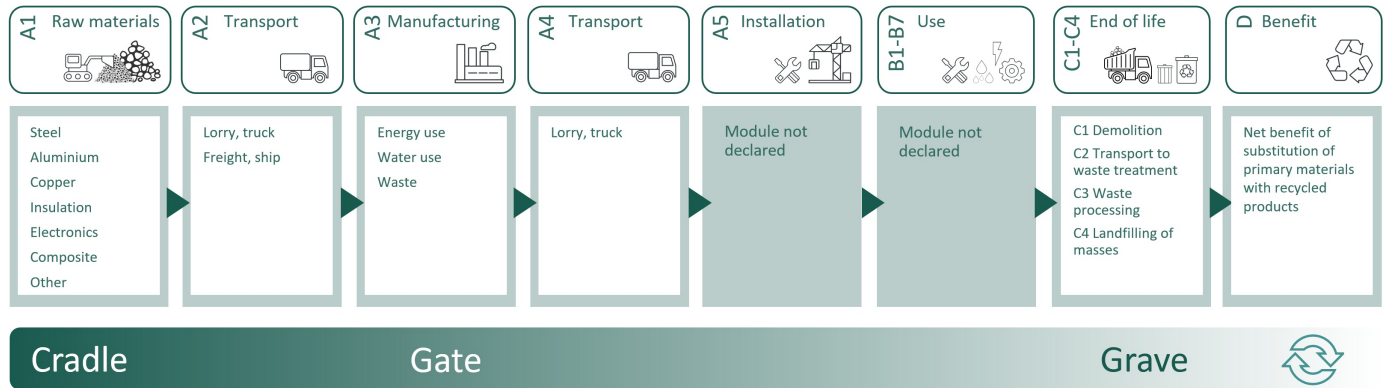
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

| Materials                                       | Source                               | Data quality             | Year |
|---|--------------------------------------|--------------------------|------|
| Adhesive  | ecoinvent 3.6                        | Database                 | 2019 |
| Chemical  | ecoinvent 3.6                        | Database                 | 2019 |
| Electronic - Unspecified                        | ecoinvent 3.6                        | Database                 | 2019 |
| Filter, plastic based                           | Modified ecoinvent 3.6               | Database                 | 2019 |
| Glass fibre reinforced plastic, polyamide       | Modified ecoinvent 3.6               | Database                 | 2019 |
| Hydronic coil (50% AL, 50%CU)                   | ecoinvent 3.6                        | Database                 | 2019 |
| Insulation, Mineral based                       | ecoinvent 3.6                        | Database                 | 2019 |
| Metal - Aluminium                               | ecoinvent 3.6                        | Database                 | 2019 |
| Metal - Copper                                  | ecoinvent 3.6                        | Database                 | 2019 |
| Metal - Galvanized Steel                        | ecoinvent 3.6                        | Database                 | 2019 |
| Metal - Steel                                   | ecoinvent 3.6                        | Database                 | 2019 |
| Metal - Steel                                   | Modified ecoinvent 3.6               | Database                 | 2019 |
| Metal - Steel with aluzinc coating              | ecoinvent 3.6                        | Database                 | 2019 |
| Metal - Steel with magnelis coating             | ecoinvent 3.6                        | Database                 | 2019 |
| Motor   | ecoinvent 3.6                        | Database                 | 2019 |
| Motor   | Modified ecoinvent 3.6               | Database                 | 2019 |
| Other   | Material composition + ecoinvent 3.6 | Supplier data + database | 2019 |
| Packaging - Paper                               | ecoinvent 3.6                        | Database                 | 2019 |
| Packaging - Plastic                             | ecoinvent 3.6                        | Database                 | 2019 |
| Plastic - Acrylonitrile butadiene styrene (ABS) | ecoinvent 3.6                        | Database                 | 2019 |
| Plastic - Polyamide                             | ecoinvent 3.6                        | Database                 | 2019 |
| Plastic - Polycarbonate (PC)                    | ecoinvent 3.6                        | Database                 | 2019 |
| Plastic - Polyethylene                          | ecoinvent 3.6                        | Database                 | 2019 |
| Plastic - Polyethylene (HDPE)                   | ecoinvent 3.6                        | Database                 | 2019 |
| Plastic - Polypropylene (PP)                    | ecoinvent 3.6                        | Database                 | 2019 |
| Plastic - Polyvinyl chloride (PVC)              | ecoinvent 3.6                        | Database                 | 2019 |
| Plastics  | ecoinvent 3.6                        | Database                 | 2019 |
| Rubber, synthetic                               | ecoinvent 3.6                        | Database                 | 2019 |

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

| Product stage |           |               |           | Construction installation stage |     | Use stage   |        |             |               |                        |                       |                            | End of life stage |                  |          |                                    | Beyond the system boundaries |
|---------------|-----------|---------------|-----------|---------------------------------|-----|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-------------------|------------------|----------|------------------------------------|------------------------------|
| Raw materials | Transport | Manufacturing | Transport | Assembly                        | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport         | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |                              |
| A1            | A2        | A3            | A4        | A5                              | B1  | B2          | B3     | B4          | B5            | B6                     | B7                    | C1                         | C2                | C3               | C4       | D                                  |                              |
| X             | X         | X             | X         | MND                             | MND | MND         | MND    | MND         | MND           | MND                    | MND                   | X                          | X                 | X                | X        | X                                  |                              |

#### System boundary:



#### Additional technical information:

Complete project specific technical documentation is generated using our AHU calculation software, SystemairCAD. Please refer to the Systemair website for more information.

## LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

For A4 a generic transportation distance (EURO6 truck) of 300 km is declared. True transportation distance can be provided in project specific EPD.

For C2 a generic transportation distance (EURO6 truck) of 50 km is declared. True transportation distance can be provided in project specific EPD.

| Transport from production place to user (A4)  | Capacity utilisation (incl. return) % | Distance (km) | Fuel/Energy Consumption | Unit  | Value (Liter/tonne) |
|---|---------------------------------------|---------------|-------------------------|-------|---------------------|
| Truck, 16-32 tonnes, EURO 6 (km)  | 36,7 %                                | 300           | 0,043                   | l/tkm | 12,90               |
| De-construction demolition (C1)   |                                       |               |                         |       |                     |
|   | Unit                                  | Value         |                         |       |                     |
| Demolition of building per kg of ventilation product (kg)   | kg/DU                                 | 1186,00       |                         |       |                     |
| Transport to waste processing (C2)  |                                       |               |                         |       |                     |
|   | Capacity utilisation (incl. return) % | Distance (km) | Fuel/Energy Consumption | Unit  | Value (Liter/tonne) |
| Truck, 16-32 tonnes, EURO 6 (km)  | 36,7 %                                | 50            | 0,043                   | l/tkm | 2,15                |
| Waste processing (C3)   |                                       |               |                         |       |                     |
|   | Unit                                  | Value         |                         |       |                     |
| Materials to recycling (kg)   | kg                                    | 926,01        |                         |       |                     |
| Waste treatment per kg Bulk iron waste, excluding reinforcement, sorting plant (kg)   | kg                                    | 45,00         |                         |       |                     |
| Waste treatment per kg Electronics scrap, Control units, incineration (kg)  | kg                                    | 8,68          |                         |       |                     |
| Waste treatment per kg Hazardous waste, incineration (kg)   | kg                                    | 3,20          |                         |       |                     |
| Waste treatment per kg plastic, industrial electronics, municipal incineration with fly ash extraction (kg)                             | kg                                    | 8,79          |                         |       |                     |
| Waste treatment per kg Plastics, from incineration (kg)   | kg                                    | 35,12         |                         |       |                     |
| Waste treatment per kg Polyethylene (PE), incineration (kg)   | kg                                    | 0,36          |                         |       |                     |
| Waste treatment per kg Polypropylene (PP), incineration (kg)  | kg                                    | 0,55          |                         |       |                     |
| Waste treatment per kg Polyvinylchloride (PVC), incineration with fly ash extraction (kg)   | kg                                    | 29,72         |                         |       |                     |
| Waste treatment per kg Rubber, municipal incineration with fly ash extraction (kg)  | kg                                    | 11,83         |                         |       |                     |
| Waste treatment per kg wire plastic, municipal incineration - C3 - RoW  | kg                                    | 0,07          |                         |       |                     |
| Disposal (C4)   |                                       |               |                         |       |                     |
|   | Unit                                  | Value         |                         |       |                     |
| Landfilling of ashes from incineration of Electronics scrap, Control units, process of ashes and residues (kg)                          | kg                                    | 6,09          |                         |       |                     |
| Landfilling of ashes from incineration of Plastics, process per kg ashes and residues (kg)  | kg                                    | 0,83          |                         |       |                     |
| Landfilling of ashes from incineration of Polyethylene (PE), process per kg ashes and residues (kg)                                     | kg                                    | 0,01          |                         |       |                     |
| Landfilling of ashes from incineration of Polypropylene (PP), process per kg ashes and residues (kg)                                    | kg                                    | 0,02          |                         |       |                     |
| Landfilling of ashes from incineration of Polyvinylchloride (PVC), process per kg ashes and residues (kg)                               | kg                                    | 4,73          |                         |       |                     |
| Landfilling of ashes from incineration of Rubber, municipal incineration with fly ash extraction (kg)                                   | kg                                    | 0,62          |                         |       |                     |
| Landfilling of ashes from incineration per kg Hazardous waste, from incineration (kg)   | kg                                    | 0,60          |                         |       |                     |
| Landfilling of ashes from incineration per kg plastic, industrial electronics, From municipal incineration with fly ash extraction (kg) | kg                                    | 0,60          |                         |       |                     |
| Landfilling of ashes from incineration per kg wire plastic, from municipal incineration (kg)  | kg                                    | 0,01          |                         |       |                     |
| Waste treatment per kg Copper slag, to landfill, residual material landfill (kg)  | kg                                    | 2,39          |                         |       |                     |
| Waste, aluminium, to landfill (kg)  | kg                                    | 12,79         |                         |       |                     |
| Waste, mineral wool, to landfil (kg)  | kg                                    | 15,99         |                         |       |                     |
| Waste, plastic, mixture, to landfill (kg)   | kg                                    | 44,73         |                         |       |                     |
| Waste, scrap steel, to landfill (kg)  | kg                                    | 81,62         |                         |       |                     |

| Benefits and loads beyond the system boundaries (D)              | Unit | Value  |  |  |  |
|--|------|--------|--|--|--|
| Substitution of electricity, in Norway (MJ)                      | MJ   | 62,79  |  |  |  |
| Substitution of primary aluminium with net scrap (kg)            | kg   | 163,18 |  |  |  |
| Substitution of primary copper with net scrap (kg)               | kg   | 14,51  |  |  |  |
| Substitution of primary steel with net scrap (kg)                | kg   | 596,72 |  |  |  |
| Substitution of thermal energy, district heating, in Norway (MJ) | MJ   | 950,01 |  |  |  |



## LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

| Environmental impact   |                        |          |          |          |          |          |          |           |  |
|--|------------------------|----------|----------|----------|----------|----------|----------|-----------|--|
| Indicator  | Unit                   | A1-A3    | A4       | C1       | C2       | C3       | C4       | D         |  |
|  GWP-total                        | kg CO <sub>2</sub> -eq | 6,53E+03 | 5,82E+01 | 1,56E+00 | 9,69E+00 | 2,25E+02 | 7,97E+00 | -2,18E+03 |  |
|  GWP-fossil                       | kg CO <sub>2</sub> -eq | 6,47E+03 | 5,81E+01 | 1,56E+00 | 9,69E+00 | 2,25E+02 | 7,96E+00 | -2,15E+03 |  |
|  GWP-biogenic                     | kg CO <sub>2</sub> -eq | 3,03E+01 | 2,41E-02 | 2,93E-04 | 4,01E-03 | 4,83E-02 | 3,23E-03 | -7,19E+00 |  |
|  GWP-luluc                        | kg CO <sub>2</sub> -eq | 3,37E+01 | 2,07E-02 | 1,23E-04 | 3,45E-03 | 8,37E-03 | 7,27E-04 | -2,80E+01 |  |
|  ODP                              | kg CFC11 -eq           | 5,20E-04 | 1,32E-05 | 3,38E-07 | 2,19E-06 | 3,47E-06 | 5,31E-07 | -4,01E-01 |  |
|  AP                               | mol H+ -eq             | 5,77E+01 | 1,67E-01 | 1,64E-02 | 2,78E-02 | 7,21E-02 | 1,48E-02 | -1,89E+01 |  |
|  EP-FreshWater                    | kg P -eq               | 4,38E-01 | 4,64E-04 | 5,69E-06 | 7,74E-05 | 4,24E-04 | 4,07E-05 | -1,36E-01 |  |
|  EP-Marine                        | kg N -eq               | 6,81E+00 | 3,30E-02 | 7,22E-03 | 5,51E-03 | 2,20E-02 | 1,02E-02 | -2,17E+00 |  |
|  EP-Terrestrial                   | mol N -eq              | 1,44E+02 | 3,70E-01 | 7,92E-02 | 6,16E-02 | 2,31E-01 | 5,52E-02 | -2,44E+01 |  |
|  POCP                             | kg NMVOC -eq           | 2,68E+01 | 1,42E-01 | 2,18E-02 | 2,36E-02 | 6,06E-02 | 1,66E-02 | -8,94E+00 |  |
|  ADP-minerals&metals <sup>1</sup> | kg Sb-eq               | 2,76E+00 | 1,61E-03 | 2,40E-06 | 2,68E-04 | 1,82E-04 | 1,67E-05 | -4,18E-02 |  |
|  ADP-fossil <sup>1</sup>          | MJ                     | 8,37E+04 | 8,79E+02 | 2,15E+01 | 1,46E+02 | 1,34E+02 | 4,10E+01 | -2,43E+04 |  |
|  WDP <sup>1</sup>                 | m <sup>3</sup>         | 7,99E+05 | 8,50E+02 | 4,57E+00 | 1,42E+02 | 1,88E+03 | 3,90E+02 | -7,96E+05 |  |

GWP-total = Global Warming Potential total; 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

"Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed







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

### Remarks to environmental impacts

This air handling unit uses electric energy for fan drive and recovers thermal energy via the rotary heat exchanger. These factors are highly project specific, and the environmental impact will vary depending on:

- Climate / outdoor conditions
- Air volume
- External pressure drop
- Supply temperature
- Extract temperature
- Operating hours
- Electricity origin
- Etc.

Energy use and heat recovery are key factors in determining the environmental impact of this product and must be calculated with project specific values. This can be done using our AHU calculation software, SystemairCAD. Please refer to the Systemair website for more information.











| Additional environmental impact indicators  |                   |          |          |          |          |          |          |           |  |
|---|-------------------|----------|----------|----------|----------|----------|----------|-----------|--|
| Indicator   | Unit              | A1-A3    | A4       | C1       | C2       | C3       | C4       | D         |  |
|  PM                  | Disease incidence | 5,67E-04 | 3,56E-06 | 4,33E-07 | 5,93E-07 | 5,20E-07 | 2,37E-07 | -1,70E-04 |  |
|  IRP <sup>2</sup>    | kgBq U235 -eq     | 3,06E+02 | 3,84E+00 | 9,22E-02 | 6,40E-01 | 6,14E-01 | 2,01E-01 | -7,87E+01 |  |
|  ETP-fw <sup>1</sup> | CTUe              | 3,08E+05 | 6,51E+02 | 1,18E+01 | 1,09E+02 | 4,23E+03 | 8,00E+03 | -1,12E+05 |  |
|  HTP-c <sup>1</sup>  | CTUh              | 3,07E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,52E-08 | 5,79E-08 | -7,59E-06 |  |
|  HTP-nc <sup>1</sup> | CTUh              | 3,19E-04 | 7,12E-07 | 1,07E-08 | 1,19E-07 | 1,39E-06 | 3,87E-06 | -3,93E-05 |  |
|  SQP <sup>1</sup>    | dimensionless     | 2,16E+04 | 6,15E+02 | 2,73E+00 | 1,02E+02 | 4,64E+01 | 1,29E+02 | -1,78E+03 |  |

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed




1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator
2. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

| Resource use  |                |          |          |          |          |           |           |           |  |
|---|----------------|----------|----------|----------|----------|-----------|-----------|-----------|--|
| Indicator   | Unit           | A1-A3    | A4       | C1       | C2       | C3        | C4        | D         |  |
|  PERE  | MJ             | 1,69E+04 | 1,26E+01 | 1,16E-01 | 2,10E+00 | 1,77E+01  | 2,34E+00  | -7,73E+03 |  |
|  PERM  | MJ             | 8,05E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  | 0,00E+00  | 0,00E+00  |  |
|  PERT  | MJ             | 1,69E+04 | 1,26E+01 | 1,16E-01 | 2,10E+00 | 1,77E+01  | 2,34E+00  | -7,73E+03 |  |
|  PENRE | MJ             | 7,89E+04 | 8,79E+02 | 2,15E+01 | 1,46E+02 | 1,34E+02  | 4,10E+01  | -2,43E+04 |  |
|  PENRM | MJ             | 4,86E+03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  | 0,00E+00  | 0,00E+00  |  |
|  PENRT | MJ             | 8,37E+04 | 8,79E+02 | 2,15E+01 | 1,46E+02 | 1,34E+02  | 4,10E+01  | -2,44E+04 |  |
|  SM    | kg             | 2,44E+02 | 0,00E+00 | 1,06E-02 | 0,00E+00 | -1,22E+00 | -1,17E+00 | 1,94E+02  |  |
|  RSF   | MJ             | 1,81E+02 | 4,50E-01 | 2,86E-03 | 7,50E-02 | 3,56E-01  | 5,20E-02  | 2,19E+01  |  |
|  NRSF  | MJ             | 2,03E+03 | 1,61E+00 | 4,21E-02 | 2,68E-01 | -7,61E-02 | 2,11E-01  | 6,73E+02  |  |
|  FW    | m <sup>3</sup> | 1,25E+02 | 9,40E-02 | 1,11E-03 | 1,57E-02 | 2,00E+00  | 6,04E-02  | -3,92E+01 |  |

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 resources; SM = Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009"






\*INA Indicator Not Assessed

| End of life - Waste   |      |       |          |          |          |          |          |          |           |
|---|------|-------|----------|----------|----------|----------|----------|----------|-----------|
| Indicator   | Unit | A1-A3 | A4       | C1       | C2       | C3       | C4       | D        |           |
|  | HWD  | kg    | 3,78E+01 | 4,53E-02 | 6,34E-04 | 7,55E-03 | 3,75E-02 | 2,00E+00 | 2,30E+00  |
|  | NHWD | kg    | 2,28E+03 | 4,27E+01 | 2,55E-02 | 7,12E+00 | 7,28E+00 | 1,68E+02 | -7,08E+02 |
|  | RWD  | kg    | 2,91E-01 | 5,99E-03 | 1,49E-04 | 9,98E-04 | 9,55E-05 | 1,53E-04 | -7,43E-02 |

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

\*Reading example: 9,0 E-03 =  $9,0 \cdot 10^{-3} = 0,009$

\*INA Indicator Not Assessed

| End of life - Output flow   |      |       |          |          |          |          |          |          |           |
|---|------|-------|----------|----------|----------|----------|----------|----------|-----------|
| Indicator   | Unit | A1-A3 | A4       | C1       | C2       | C3       | C4       | D        |           |
|  | CRU  | kg    | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
|  | MFR  | kg    | 4,55E+02 | 0,00E+00 | 1,04E-02 | 0,00E+00 | 9,26E+02 | 1,95E-02 | 1,67E+02  |
|  | MER  | kg    | 1,34E+00 | 0,00E+00 | 3,22E-05 | 0,00E+00 | 4,13E+01 | 2,91E-04 | -7,90E-02 |
|  | EEE  | MJ    | 2,98E+01 | 0,00E+00 | 1,10E-04 | 0,00E+00 | 6,77E+01 | 3,16E-01 | 9,43E+00  |
|  | EET  | MJ    | 4,51E+02 | 0,00E+00 | 1,67E-03 | 0,00E+00 | 1,02E+03 | 4,78E+00 | 1,43E+02  |

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

\*Reading example: 9,0 E-03 =  $9,0 \cdot 10^{-3} = 0,009$

\*INA Indicator Not Assessed

| Biogenic Carbon Content                           |      |                     |
|---|------|---------------------|
| Indicator   | Unit | At the factory gate |
| Biogenic carbon content in product                | kg C | 0,00E+00            |
| Biogenic carbon content in accompanying packaging | kg C | 9,52E-02            |

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>

## Additional requirements

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

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

| Electricity mix           | Source        | Amount | Unit                      |
|---------------------------|---------------|--------|---------------------------|
| Electricity, Norway (kWh) | ecoinvent 3.6 | 24,33  | g CO <sub>2</sub> -eq/kWh |

### Dangerous substances

The product contains no substances on the REACH Candidate list at or above 100 ppm, 0,01 % by weight.

### Indoor environment

The air handling unit is an essential component for obtaining good thermal and atmospheric conditions. An optimally sized and well-functioning AHU will have direct positive effects on human health, wellbeing, and productivity and is a crucial prerequisite for achieving a healthy indoor environment.






## Additional Environmental Information

| Additional environmental impact indicators required in NPCR Part A for construction products |                        |          |          |          |          |          |          |           |
|--|------------------------|----------|----------|----------|----------|----------|----------|-----------|
| Indicator  | Unit                   | A1-A3    | A4       | C1       | C2       | C3       | C4       | D         |
| GWPIOBC  | kg CO <sub>2</sub> -eq | 6,52E+03 | 5,82E+01 | 1,56E+00 | 9,69E+00 | 2,25E+02 | 4,31E+00 | -2,42E+03 |

GWPIOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

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