

# Environmental Product Declaration

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

Product family

Elitfönster Original Alu

Model

Window Fixed frame Alu

Product name

AFK

From

**Elitfönster AB**

**Box 153**

**574 22 Vetlanda**

**Publication date 2021-08-27**

Valid for 5 years until 2026-08-27

## Programme

The International EPD® System, [www.environdec.com](http://www.environdec.com)

## Programme operator

EPD International AB

## EPD registration number

S-P-03738

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](http://www.environdec.com)



**Environmental Product Declarations (EPD)** present transparent, verified and comparable information about the life-cycle environmental impact of products.

The International EPD® System is a global program for environmental declarations based on ISO 14025 and EN 15804. The EPD online database currently contains more than 1100 EPDs for a wide range of product categories by organisations in 45 countries.

## Company information

### Owner of the EPD

Elitfönster AB  
Honnörsgatan 2  
352 36 Växjö

### Description of the organisation

Elitfönster AB is with its wide range of windows, Sweden's leading window manufacturers with traditions from Småland since 1924. The company has about 1,000 employees and is represented throughout Sweden.

Since 2004 Elitfönster AB has been a part of Inwido. As Europe's leading window group, Inwido's business concept is to develop and sell the market's best customized window and door solutions through a decentralized structure and with a focus on the consumer-driven market, in order to create long-term sustainable growth, organically and through acquisitions. Inwido consists of 28 business units with approximately 4,300 employees in eleven countries.

### Contact/Certification and test manager

Mats Brånäs  
Tel 010-451 42 19  
Mobile 070-388 41 89  
E-mail mats.branas@elitfonster.se

### Product-related or management system-related certifications

ISO 9001:2015, ISO 14001:2015  
Sunda Hus, Byggvarubedömningen, Basta

### Average or specific EPD:

Average

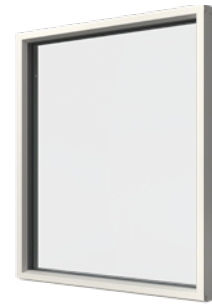


## Product information

### Fixed frame Alu - AFK

Fixed frame in wood with external aluminum cladding and a 3-glazed insulating glass glazed from the outside.

According to the Construction Products Regulation CPR (EU) no. 305/2011, the essential properties of the product must be declared in the CE marking and Declaration of Performance. The technical properties of the window are declared in the Declaration of Performance, DoP no. 61-29-CE1020201 which can be accessed on Elitfönster's website.



## LCA information

|                                     |   |
|-------------------------------------|---|
| <b>Functional Unit</b>              | <p>The functional unit used in this report is 1 m<sup>2</sup>.<br/>The weight of finished AFK is 36,58 kg per m<sup>2</sup>.</p> <p>Standard size is 1230 x 1480mm</p>  |
| <b>Reference Service Life (RSL)</b> | <p>The RSL is set to 50 years. The RSL is based on the fact that windows with aluminum-clad windows have a longer service life than similar windows made of PVC or wood.</p>  |
| <b>Product group classification</b> | <p>UN CPC 42120</p>   |
| <b>Goal and Scope</b>               | <p>The result will be used to understand where the environmental burden for the product occurs during the life cycle and aim to lay a road map for development to reduce this burden. The result will be communicated by the International EPD system.</p>  |
| <b>Manufacturing Site</b>           | <p>Brogårdsgatan 1, 574 38, Vetlanda, Sverige, Industrigatan, 360 73, Lenhovda, Sverige</p>   |
| <b>Geographical Area</b>            | <p>Europe</p>   |
| <b>Compliant with</b>               | <p>This EPD follows the "Book-keeping" LCA approach which is defined as an attributional LCA in the ISO 14040 standard.</p> <p>The EPD is compliant with:</p> <ul style="list-style-type: none"> <li>• ISO 14025</li> <li>• EN 15804:2012+A2:2019</li> <li>• Product Category Rules PCR 2019-12-20. Construction products and construction services. Version 2.33</li> <li>• Sub-PCR-007 Windows and doors (EN 17213)</li> </ul>  |
| <b>Cut-Off Rules</b>                | <p>The procedure below is followed for the exclusion of inputs and outputs according to the EN 15804:2012+ A2:2019 standard:</p> <ul style="list-style-type: none"> <li>• In the case of insufficient input data or data gaps for a unit process, the cut-off criterion is 1 % of renewable and non-renewable primary energy usage and 1 % of the total mass input to that unit process.</li> <li>• The maximum neglected input flows per declared module (A1- A3) is 5 % of energy usage and mass.</li> </ul> <p>No cut-offs have been made concerning specific data in this study.</p>  |
| <b>Background Data</b>              | <p>The data quality of the background data is considered good. All site-specific data is collected from the year 2019. ecoinvent is the world's biggest LCI data library and the latest and most updated version was used. ecoinvent's data library contain data for the specific geographical regions relevant for this study.</p> <p>The assessment considers all available data from the production process, including all raw materials and auxiliary materials used as well as the energy consumption in relation to available ecoinvent 3.6 datasets for the manufacture of concrete piles.</p> <p>The background data from ecoinvent 3.6 are from 2016-2019</p>  |
| <b>Electricity data</b>             | <p>Electricity consumption in the A3 module comes from 100% wind power certified by Guarantee of Origin, Electricity is represented by data in ecoinvent 3.6 regionalized for Sweden.</p>   |
| <b>Assumptions</b>                  | <p>In A4 the transport distance is assumed to be 320km, based on average distances 2020.</p> <p>When installing and uninstalling the window no environmental aspects in addition to using of electrical machines is assumed according to installation instructions from Elitfönster.</p> <p>The used window is assumed to be transported 50km to the closest waste management facility.</p> <p>The window is assumed to require 60 ml/m<sup>2</sup> of cleaning solution per year.</p> <p>The used window is assumed to be transported 50km to the closest waste management facility. There it is disassembled, and the following waste treatment activities performed:</p> <ul style="list-style-type: none"> <li>• Aluminum and steel are recycled at 90% collection rate</li> <li>• Glass is landfilled at 100% landfilling rate</li> <li>• Wood, paint, plastic, rubber and misc. is assumed to be incinerated with energy recovery at a municipal incineration plant at 90% incineration rate.</li> </ul> <p>Waste not recycled or incinerated is assumed to go to landfill.</p> |

---

|                                  |   |
|----------------------------------|---|
| <b>Allocations</b>               | Polluter Pays / Allocation by Classification<br><br>Two allocation rules are applied:<br>1) the raw material necessary for the manufacture is allocated by mass of the declared unit<br><br>2) the energy necessary for the manufacture is allocated in MJ by production of the declared unit |
| <b>Impact Assessment methods</b> | Potential environmental impacts are calculated with Environmental Footprint 3.0 method as implemented in SimaPro 9.1.<br><br>Resource use values are calculated from Cumulative Energy Demand V1.11.  |
| <b>Based on LCA Report</b>       | Miljögiraff report 943 LCA Elitfönster  |
| <b>LCA Practitioner</b>          | Viktor Hakkarainen, Miljögiraff AB  |
| <b>Software</b>                  | SimaPro 9.1.1.7   |

---

The product documented within this EPD contains no substances in the REACH Candidate list. Furthermore, the product does not contain any substances from the Norwegian priority list.

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.



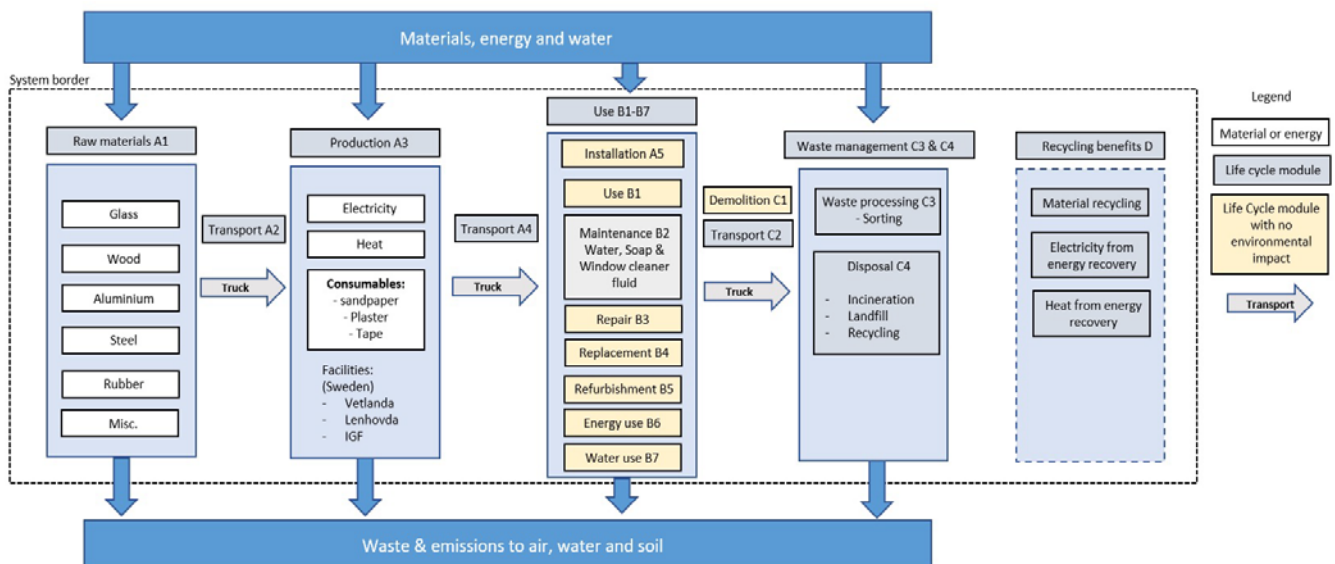
## System Boundary

This is a Cradle to Grave with modules A+B+C+D (see Table 1 for included modules). The system boundary mean that all processes needed for raw material extraction, transport, manufacturing and disposal are included in the study. For an overview of the included processes see Figure 2.

**Table 1, show an overview of the included and accounted life cycle phases.**

|                                 | Product stage       |           | Construction process stage |           |                           | Use stage |             |        |             |               |                        |                       | End of life stage          |           |                  |          | Resource recovery stage |
|---------------------------------|---------------------|-----------|----------------------------|-----------|---------------------------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|-------------------------|
|                                 | Raw material supply | Transport | Manufacturing              | Transport | Construction installation | Use       | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal |                         |
| <b>Module</b>                   | A1                  | A2        | A3                         | A4        | A5                        | B1        | B2          | B3     | B4          | B5            | B6                     | B7                    | C1                         | C2        | C3               | C4       | D                       |
| <b>Modules declared</b>         | X                   | X         | X                          | X         | X                         | X         | X           | X      | X           | X             | X                      | X                     | X                          | X         | X                | X        | X                       |
| <b>Geography</b>                | Euro                | Euro      | SE                         | SE        | SE                        | SE        | SE          | SE     | SE          | SE            | SE                     | SE                    | SE                         | SE        | SE               | SE       | SE                      |
| <b>Average data variability</b> | -                   | <10%      | <10%                       | -         | -                         | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                       |
| <b>Specific data</b>            | >90%                |           |                            |           |                           | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                       |

**Figure 2, shows what is included in the different modules.**



## Content and life cycle information

The Fixed frame Alu – AFK consist of 16 raw materials.  
The weight per FU and part recycled material can be seen in Table 2.

**Table 2, show the weight and part recycled material for the raw material in Fixed frame Alu – AFK**

| Raw material            | kg per m <sup>2</sup><br>Fixed frame Alu – AFK | Post-consumer material,<br>weight-% |
|-------------------------|--|-------------------------------------|
| Glass                   | 29,71  | 9,3                                 |
| Argon                   | 0,05   | 0                                   |
| Distance list           | 0,28   | 0                                   |
| Edge sealing compound   | 0,63   | 0                                   |
| Butyl                   | 0,06   | 0                                   |
| Desiccant               | 0,24   | 0                                   |
| Pinewood                | 8,81   | 0                                   |
| Surface treatment pine  | 1,13   | 0                                   |
| Aluminum                | 1,10   | 0                                   |
| Powder coating aluminum | 0,04   | 0                                   |
| Steel                   | 0,13   | 45                                  |
| Plastic                 | 0,04   | 0                                   |
| Rubber EPDM             | 1,04   | 0                                   |
| Glue                    | 0,01   | 0                                   |
| Sealant                 | 0,03   | 0                                   |
| Wood impregnating agent | 0,002  | 0                                   |

Elitfönster uses pine by FSC-labeled and / or PEFC-labeled suppliers. They are cut, planed and processed in Elitfönster premises in Vetlanda and Lenhovda, the finished wood details are vacuum impregnated and surface treated with a solvent-based paint system. Elitfönster's own glass factory IGF in Lenhovda buys flat glass from Europe's largest glass manufacturer. IGF cuts the glass and manufactures the insulating glass. The glass panes are then installed in the product in Elitfönster's production unit in Vetlanda and Lenhovda. Aluminum profiles are supplied by Hydro Extrusion in Vetlanda, they are powder coated on A-paint in Sävsjö and processed and finally assembled in Elitfönster's premises in Vetlanda and Lenhovda. The finished windows are packed on pallets with plywood slats and cardboard corners and plasticized with shrink plastic. The windows are transported on a pallet by truck to the customer.

To produce 1 m<sup>2</sup> Fixed frame Alu – AFK, 13,13 kWh of electricity and 9,84 kWh of heat is used.  
Electricity is certified wind power electricity.

9,28 kWh of the heat comes from own combustion from waste in production, the rest comes from the district heating network in Vetlanda. District heating in Vetlanda comes to 98.7% from renewable sources.

In total, 21 % of waste is generated in production. A large part of the waste is wood.

During usage, no indoor emissions arise. The paint used is water based and all the other raw materials do not emit any emissions.

Due to the enhanced durability of an aluminum clad window's physical properties, no change of IGU is required during the windows 50-year lifespan (Carlsson, 2009).

The EPD is average for the production of AFK windows from Elitfönster's factories in Vetlanda and Lenhovda. The environmental impact from the different production sites is within +/-10% for all environmental impact categories and is therefore not declared separately. GWP is within +/-1% difference between the manufacturing sites. The difference stems from small differences in internal transports as well as different cleaning procedures for the surface treatment system and emissions from local heat production.

**Environmental Information – Fixed frame Alu – AFK**

Potential environmental impact – mandatory indicators according to EN 15804.

| Impact category                                | Unit                             | A1       | A2       | A3       | A1-A3           | A4       | A5       | B1       | B2       | B3       |
|--|----------------------------------|----------|----------|----------|-----------------|----------|----------|----------|----------|----------|
| <b>Climate change</b>                          | kg CO <sub>2eq</sub>             | 34,03    | 6,08     | 5,29     | <b>45,39</b>    | 1,95     | 2,50     | 0,00     | 3,62     | 0,00     |
| <b>Climate change - Fossil</b>                 | kg CO <sub>2eq</sub>             | 49,81    | 6,06     | 1,80     | <b>57,67</b>    | 1,94     | 0,14     | 0,00     | 2,81     | 0,00     |
| <b>Climate change - Biogenic</b>               | kg CO <sub>2eq</sub>             | -16,03   | 0,01     | 3,49     | <b>-12,53</b>   | 0,00     | 2,36     | 0,00     | 0,63     | 0,00     |
| <b>Climate change - Land use and LU change</b> | kg CO <sub>2eq</sub>             | 0,24     | 0,00     | 0,01     | <b>0,25</b>     | 0,00     | 0,00     | 0,00     | 0,18     | 0,00     |
| <b>Ozone depletion</b>                         | kg CFC11 <sub>eq</sub>           | 6,40E-06 | 1,38E-06 | 2,24E-07 | <b>8,01E-06</b> | 4,41E-07 | 2,03E-09 | 0,00E+00 | 3,75E-07 | 0,00E+00 |
| <b>Acidification</b>                           | mol H <sup>+</sup> <sub>eq</sub> | 0,44     | 0,02     | 0,01     | <b>0,48</b>     | 0,01     | 0,00     | 0,00     | 0,02     | 0,00     |
| <b>Eutrophication, freshwater</b>              | kg P <sub>eq</sub>               | 0,012    | 0,000    | 0,001    | <b>0,014</b>    | 0,000    | 0,000    | 0,000    | 0,001    | 0,000    |
| <b>Eutrophication, freshwater</b>              | kg PO <sub>4eq</sub>             | 0,038    | 0,001    | 0,002    | <b>0,042</b>    | 0,000    | 0,000    | 0,000    | 0,003    | 0,000    |
| <b>Eutrophication, marine</b>                  | kg N <sub>eq</sub>               | 0,071    | 0,007    | 0,003    | <b>0,082</b>    | 0,002    | 0,000    | 0,000    | 0,006    | 0,000    |
| <b>Eutrophication, terrestrial</b>             | mol N <sub>eq</sub>              | 0,81     | 0,08     | 0,04     | <b>0,93</b>     | 0,03     | 0,00     | 0,00     | 0,04     | 0,00     |
| <b>Photochemical ozone formation</b>           | kg NMVOC <sub>eq</sub>           | 0,23     | 0,02     | 0,01     | <b>0,27</b>     | 0,01     | 0,00     | 0,00     | 0,01     | 0,00     |
| <b>Resource use, minerals and metals</b>       | kg Sb <sub>eq</sub>              | 4,77E-04 | 2,18E-05 | 8,80E-05 | <b>5,87E-04</b> | 7,00E-06 | 4,98E-08 | 0,00E+00 | 4,11E-05 | 0,00E+00 |
| <b>Resource use, fossils</b>                   | MJ                               | 743      | 92       | 26       | <b>861</b>      | 29       | 0        | 0        | 46       | 0        |
| <b>Water use</b>                               | m <sup>3</sup> depriv.           | 15,72    | 0,25     | 0,53     | <b>16,51</b>    | 0,08     | 0,00     | 0,00     | 4,91     | 0,00     |
| <b>Particulate matter</b>                      | disease inc.                     | 4,56E-06 | 4,20E-07 | 7,91E-07 | <b>5,77E-06</b> | 1,35E-07 | 3,17E-09 | 0,00E+00 | 1,87E-07 | 0,00E+00 |
| <b>Ionising radiation</b>                      | kBq U-235 <sub>eq</sub>          | 4,93     | 0,48     | 0,16     | <b>5,57</b>     | 0,15     | 0,00     | 0,00     | 0,35     | 0,00     |
| <b>Ecotoxicity, freshwater</b>                 | CTUe                             | 1543     | 70       | 85       | <b>1698</b>     | 22       | 1        | 0        | 107      | 0        |
| <b>Human toxicity, cancer</b>                  | CTUh                             | 5,99E-08 | 2,50E-09 | 4,95E-09 | <b>6,74E-08</b> | 8,01E-10 | 7,14E-11 | 0,00E+00 | 3,17E-09 | 0,00E+00 |
| <b>Human toxicity, non-cancer</b>              | CTUh                             | 7,42E-07 | 7,12E-08 | 5,79E-08 | <b>8,71E-07</b> | 2,28E-08 | 3,14E-09 | 0,00E+00 | 6,68E-08 | 0,00E+00 |
| <b>Land use</b>                                | Pt                               | 718      | 63       | 297      | <b>1078</b>     | 20       | 0        | 0        | 37       | 0        |



**>> Environmental Information – Fixed frame Alu – AFK**

Potential environmental impact – mandatory indicators according to EN 15804.

| Impact category                                | Unit                             | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4       | D         |
|--|----------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| <b>Climate change</b>                          | kg CO <sub>2eq</sub>             | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,46     | 0,02     | 18,95    | -9,33     |
| <b>Climate change - Fossil</b>                 | kg CO <sub>2eq</sub>             | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,46     | 0,01     | 5,94     | -5,67     |
| <b>Climate change - Biogenic</b>               | kg CO <sub>2eq</sub>             | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,01     | 13,01    | -3,49     |
| <b>Climate change - Land use and LU change</b> | kg CO <sub>2eq</sub>             | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | -0,17     |
| <b>Ozone depletion</b>                         | kg CFC11 <sub>eq</sub>           | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,03E-07 | 6,39E-10 | 8,56E-08 | -4,63E-07 |
| <b>Acidification</b>                           | mol H <sup>+</sup> <sub>eq</sub> | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | -0,05     |
| <b>Eutrophication, freshwater</b>              | kg P <sub>eq</sub>               | 0,000    | 0,000    | 0,000    | 0,000    | 0,000    | 0,000    | 0,000    | 0,000    | -0,002    |
| <b>Eutrophication, freshwater</b>              | kg PO <sub>4</sub> <sub>eq</sub> | 0,000    | 0,000    | 0,000    | 0,000    | 0,000    | 0,000    | 0,000    | 0,00     | -0,01     |
| <b>Eutrophication, marine</b>                  | kg N <sub>eq</sub>               | 0,000    | 0,000    | 0,000    | 0,000    | 0,000    | 0,001    | 0,000    | 0,00     | -0,01     |
| <b>Eutrophication, terrestrial</b>             | mol N <sub>eq</sub>              | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,01     | 0,00     | 0,02     | -0,11     |
| <b>Photochemical ozone formation</b>           | kg NMVOC <sub>eq</sub>           | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | -0,03     |
| <b>Resource use, minerals and metals</b>       | kg Sb <sub>eq</sub>              | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,64E-06 | 3,15E-07 | 0,00     | 0,00      |
| <b>Resource use, fossils</b>                   | MJ                               | 0        | 0        | 0        | 0        | 0        | 7        | 2        | 5        | -217      |
| <b>Water use</b>                               | m <sup>3</sup> depriv.           | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,02     | 0,03     | 0,19     | -3,10     |
| <b>Particulate matter</b>                      | disease inc.                     | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,15E-08 | 9,73E-10 | 0,00     | 0,00      |
| <b>Ionising radiation</b>                      | kBq U-235 <sub>eq</sub>          | 0,00     | 0,00     | 0,00     | 0,00     | 0,00     | 0,04     | 0,16     | 0,03     | -11,97    |
| <b>Ecotoxicity, freshwater</b>                 | CTUe                             | 0        | 0        | 0        | 0        | 0        | 5        | 1        | 16       | -249      |
| <b>Human toxicity, cancer</b>                  | CTUh                             | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,88E-10 | 2,12E-11 | 2,71E-09 | -1,58E-08 |
| <b>Human toxicity, non-cancer</b>              | CTUh                             | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,34E-09 | 2,69E-10 | 3,28E-08 | -2,25E-07 |
| <b>Land use</b>                                | Pt                               | 0        | 0        | 0        | 0        | 0        | 5        | 1        | 8        | -236      |

**Use of resources – Fixed frame Alu – AFK**

|                      | Unit  | A1    | A2   | A3    | A1-A3 | A4   | A5   | B1   | B2   | B3     |
|----------------------|---|-------|------|-------|-------|------|------|------|------|--------|
| <b>PERE</b>          | MJ  | 165,7 | 1,2  | 52,4  | 219,2 | 0,4  | 0,0  | 0,0  | 12,6 | 0,0    |
| <b>PERM</b>          | MJ  | 167,4 | 0,0  | 59,3  | 226,7 | 0,0  | 0,0  | 0,0  | 0,0  | 0,0    |
| <b>PERT</b>          | MJ  | 333,0 | 1,2  | 111,7 | 446,0 | 0,4  | 0,0  | 0,0  | 12,6 | 0,0    |
| <b>PENRE</b>         | MJ  | 699,1 | 97,4 | 23,8  | 820,3 | 31,2 | 0,2  | 0,0  | 49,3 | 0,0    |
| <b>PENRM</b>         | MJ  | 100,8 | 0,0  | 3,5   | 104,3 | 0,0  | 0,0  | 0,0  | 0,0  | 0,0    |
| <b>PENRT</b>         | MJ  | 799,9 | 97,4 | 27,3  | 924,6 | 31,2 | 0,2  | 0,0  | 49,3 | 0,0    |
| <b>SM</b>            | Kg  | 2,8   | 0,0  | 0,0   | 2,8   | 0,0  | 0,0  | 0,0  | 0,0  | 0,0    |
| <b>RSF</b>           | MJ  | 0,0   | 0,0  | 0,0   | 0,0   | 0,0  | 0,0  | 0,0  | 0,0  | 0,0    |
| <b>NRSF</b>          | MJ  | 0,0   | 0,0  | 0,0   | 0,0   | 0,0  | 0,0  | 0,0  | 0,0  | 0,0    |
| <b>FW</b>            | m <sup>3</sup>  | 0,32  | 0,02 | 0,02  | 0,35  | 0,01 | 0,00 | 0,00 | 2,64 | 0,00   |
|                      | Unit  | B4    | B5   | B6    | B7    | C1   | C2   | C3   | C4   | D      |
| <b>PERE</b>          | MJ  | 0,0   | 0,0  | 0,0   | 0,0   | 0,0  | 0,1  | 1,0  | 0,2  | -137,7 |
| <b>PERM</b>          | MJ  | 0,0   | 0,0  | 0,0   | 0,0   | 0,0  | 0,0  | 0,0  | 0,0  | 0,0    |
| <b>PERT</b>          | MJ  | 0,0   | 0,0  | 0,0   | 0,0   | 0,0  | 0,1  | 1,0  | 0,2  | -137,7 |
| <b>PENRE</b>         | MJ  | 0,0   | 0,0  | 0,0   | 0,0   | 0,0  | 7,3  | 2,2  | 5,8  | -221,2 |
| <b>PENRM</b>         | MJ  | 0,0   | 0,0  | 0,0   | 0,0   | 0,0  | 0,0  | 0,0  | 0,0  | 0,0    |
| <b>PENRT</b>         | MJ  | 0,0   | 0,0  | 0,0   | 0,0   | 0,0  | 7,3  | 2,2  | 5,8  | -221,2 |
| <b>SM</b>            | Kg  | 0,0   | 0,0  | 0,0   | 0,0   | 0,0  | 0,0  | 0,0  | 0,0  | 0,0    |
| <b>RSF</b>           | MJ  | 0,0   | 0,0  | 0,0   | 0,0   | 0,0  | 0,0  | 0,0  | 0,0  | 0,0    |
| <b>NRSF</b>          | MJ  | 0,0   | 0,0  | 0,0   | 0,0   | 0,0  | 0,0  | 0,0  | 0,0  | 0,0    |
| <b>FW</b>            | m <sup>3</sup>  | 0,00  | 0,00 | 0,00  | 0,00  | 0,00 | 0,00 | 0,00 | 0,01 | -0,07  |
| <b>Abbreviations</b> | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials;<br>PERM = Use of renewable primary energy resources used as raw materials;<br>PERT = Total use of renewable primary energy resources;<br>PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;<br>PENRM = Use of non-renewable primary energy resources used as raw materials;<br>PENRT = Total use of non-renewable primary energy re-sources;<br>SM = Use of secondary material;<br>RSF = Use of renewable secondary fuels;<br>NRSF = Use of non-renewable secondary fuels;<br>FW = Use of net fresh water |       |      |       |       |      |      |      |      |        |

**Waste production and output flows - Fixed frame Alu - AFK**
**Waste production**

| Indicator                     | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 |
|-------------------------------|------|----|----|----|-------|----|----|----|----|----|
| Hazardous waste disposed      | kg   | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0  |
| Non-hazardous waste disposed  | kg   | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0  |
| Radioactive waste disposed    | kg   | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0  |
|                               |      |    |    |    |       |    |    |    |    |    |
| Indicator                     | Unit | B4 | B5 | B6 | B7    | C1 | C2 | C3 | C4 | D  |
| Materials for energy recovery | kg   | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0  |
| Exported energy, electricity  | MJ   | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0  |
| Exported energy, thermal      | MJ   | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0  |

**Output flows**

| Indicator                     | Unit | A1 | A2 | A3  | A1-A3 | A4 | A5   | B1 | B2  | B3 |
|-------------------------------|------|----|----|-----|-------|----|------|----|-----|----|
| Components for re-use         | kg   | 0  | 0  | 0   | 0     | 0  | 0    | 0  | 0   | 0  |
| Material for recycling        | kg   | 0  | 0  | 0,4 | 0,4   | 0  | 0,02 | 0  | 0   | 0  |
| Materials for energy recovery | kg   | 0  | 0  | 4,3 | 4,3   | 0  | 3,2  | 0  | 0   | 0  |
| Exported energy, electricity  | MJ   | 0  | 0  | 0   | 0     | 0  | 0    | 0  | 0   | 0  |
| Exported energy, thermal      | MJ   | 0  | 0  | 0   | 0     | 0  | 0    | 0  | 0   | 0  |
|                               |      |    |    |     |       |    |      |    |     |    |
| Indicator                     | Unit | B4 | B5 | B6  | B7    | C1 | C2   | C3 | C4  | D  |
| Components for re-use         | kg   | 0  | 0  | 0   | 0     | 0  | 0    | 0  | 0   | 0  |
| Material for recycling        | kg   | 0  | 0  | 0   | 0     | 0  | 0    | 0  | 0,9 | 0  |
| Materials for energy recovery | kg   | 0  | 0  | 0   | 0     | 0  | 0    | 0  | 7,0 | 0  |
| Exported energy, electricity  | MJ   | 0  | 0  | 0   | 0     | 0  | 0    | 0  | 0   | 0  |
| Exported energy, thermal      | MJ   | 0  | 0  | 0   | 0     | 0  | 0    | 0  | 0   | 0  |

**Information on biogenic carbon content**

| Results per functional or declared unit |      |          |
|---|------|----------|
| BIOGENIC CARBON CONTENT                 | Unit | QUANTITY |
| Biogenic carbon content in product      | kg C | 2,8      |
| Biogenic carbon content in packaging    | kg C | 1,6      |

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

## Annex C – Voluntary use stage scenario based on energy balance calculation

Use stage environmental impacts illustrates the annual environmental impacts due to the energy balance of the windows, based on Stockholm heating demand average and an energy balance formula based on the described scenario.

| General information                          |                                   |  |
|--|-----------------------------------|--|
|  |                                   | Comments   |
| Heating method according to EN 17213 annex C | District heating from natural gas | LCI dataset: Heat, central or small-scale, natural gas {RER}  market group for   Cut-off, U  |
| Cooling method according to EN 17213 annex C | Electricity powered air cooler    | LCI dataset: Electricity, low voltage {SE}  market for   Cut-off, U  |
| Climate Zone                                 | III                               | According to Swedish building standards, used climate file: "Stockholm 1981-2010" from the Swedish Meteorological and Hydrological Institute |
| Annual average temperature                   | 6,8 °C                            | Stockholm  |
| Min indoor temperature                       | 21 °C                             | Heating stops at this temperature  |
| Max indoor temperature                       | 27 °C                             | Cooling stops at this temperature  |
| Cooling Factor                               | 3                                 | kWh cooling delivered per kWh of electricity   |
| Model (Calculation)                          | Single room                       |  |
| Orientation                                  | West (270°)                       |  |
| Calculation method                           | Hourly                            |  |
| Modelling program                            | VIP-Energy 4.3.2                  | Modeled as a 1 m <sup>2</sup> room with concrete flooring and no walls or internal loads   |
| Environmental Impact assessment model        | Environmental Footprint 3.0       |  |

| Technical specifications      |                               |
|-------------------------------|-------------------------------|
| <b>U-value</b>                | <b>1,1 w/m<sup>2</sup>, K</b> |
| Gg-value                      | 60 %                          |
| Gw-value                      | 51 %                          |
| Air leakage class             | 4                             |
| Air leakage flow at +/- 50 Pa | 0,2 l/s,m <sup>2</sup>        |
| Daylight factor, LT-value     | 75 %                          |
| Glass/frame ratio             | 0,85                          |
| Total heating demand          | 77 kWh heat/year              |
| Total cooling demand          | 27 kWh electricity/year       |

## >> Annex C – Voluntary use stage scenario based on energy balance calculation

The results below are the environmental impacts that are presented in line with instructions from EN 17213 appendix C. It is worth noting that some units are differing from units that are presented in results for the LCA. For comparison, multiply the result below by the following factors:

Acidification: 1.31 to report kg SO<sub>2</sub>, eq as mol H<sup>+</sup>, eq

Eutrophication: 0.33 to report kg PO<sub>4</sub>-<sup>3</sup>, eq. Kg P, eq

Photochemical Ozone Creation Potential: 1.69 to report kg C<sub>2</sub>H<sub>4</sub>, eq as kg NMVOC, eq

| Yearly environmental impacts                   |   |   |   |
|--|---|---|---|
| Environmental impact category                  | Unit  | Environmental impacts of heating, natural gas | Environmental impacts of cooling, electricity |
| Global Warming Potential                       | kg CO <sub>2,eq</sub>                             | 21,11   | 1,32  |
| Ozone Depletion Potential                      | kg CFC-11 <sub>eq</sub>                           | 2,08E-06                                      | 3,96E-08                                      |
| Acidification Potential                        | kg SO <sub>2,eq</sub>                             | 1,75E-02                                      | 3,19E-03                                      |
| Eutrophication Potential                       | kg PO <sub>4</sub> - <sup>3</sup> , <sub>eq</sub> | 2,15E-03                                      | 1,39E-03                                      |
| Photochemical Ozone Creation Potential         | kg C <sub>2</sub> H <sub>4</sub>                  | 1,23E-02                                      | 1,73E-03                                      |
| Abiotic Depletion Potential, minerals & metals | kg Sb, <sub>eq</sub>                              | 2,63E-05                                      | 6,83E-05                                      |
| Abiotic Depletion Potential, fuels.            | MJ  | 299   | 123   |

## General information

### Programme information

**Programme:** The International EPD® System

**Address:** EPD International AB  
Box 210 60  
SE-100 31 Stockholm  
Sweden

**Website:** [www.environdec.com](http://www.environdec.com)

**E-mail:** [info@environdec.com](mailto:info@environdec.com)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

**Product category rules (PCR):** Construction products and construction services. Version 1.1

**PCR review was conducted by:** PCR Committee: IVL Swedish Environmental Research Institute, Swedish Environmental Protection Agency, SP Trä, Swedish Wood Preservation Institute, Swedisol, SCDA, Svenskt Limträ AB, SSAB  
Moderator: Martin Erlandsson, IVL Swedish Environmental Research Institute

#### Independent third-party verification of the declaration and data, according to ISO 14025:2006:

EPD process certification       EPD verification

Third party verifier: Martyna Mikusinska, Sweco, Individual verifier approved by the International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes       No

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

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



## References

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

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

EN ISO 14025:2014-02 Environmental labels and declarations - Type III environmental declarations - Principles and procedures, Edited in 2010.

EN ISO 14040:2006 Environmental management - Life cycle assessment - Principles and framework, 2006.

EN ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines, 2006.

ILCD International guide for life-cycle data system.  
General guide for life cycle assessment – Detailed guidance, 2010.

PCR Construction Products and Construction Services. 2019:14,  
version 2.33, the International EPD System, Date 2019-12-20.

PRé Consultants, "SimaPro 9.1" (PRé Consultants, 2019),  
<http://www.pre-sustainability.com/simapro>.

Ecoinvent, 'Ecoinvent' <<https://www.ecoinvent.org/database/database.html>>.

Hakkarainen Viktor, Miljögiraff AB, LCA Elitfönster Miljögiraff Report 943, 2021-06-31.

Brånäs Mats, Elitfönster, Certification and testing manager, [mats.branas@elitfonster.se](mailto:mats.branas@elitfonster.se)