



# ENVIRONMENTAL PRODUCT DECLARATION

In accordance with EN 15804  
and ISO 14025

## ECOPHON HYGIENE PERFORMANCE A/VLX

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

**Programme operator:** EPD International AB

**Version:** 1.0

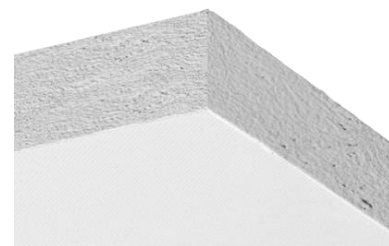
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at [www.environdec.com](http://www.environdec.com).



The environmental impacts of this product have been assessed over its whole life cycle. Its Environmental Product Declaration has been verified by an independent third party.



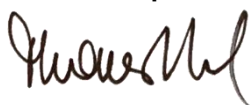
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# SUMMARY ENVIRONMENTAL PRODUCT DECLARATION

| Content summary                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Verified by (external third-party verifier) | Martin Erlandsson, IVL Swedish Environmental Research Institute                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Programme used                              | The International EPD System. For more information see <a href="http://www.environdec.com">www.environdec.com</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Registration No                             | S-P-11555                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Owners declaration by                       | Saint-Gobain Ecophon AB<br>Box 500<br>265 03 Hyllinge<br>Sweden                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Declaration as construction products        | <p>The products to be verified herein are acoustic glass wool panels made for sound absorbing ceilings.</p> <p>The present environmental product declaration complies with standard ISO 14025 and describes the environmental impact. Its purpose is to promote compatible and sustainable environmental development of related construction methods.</p> <p>Reference PCR documents: EN 15804 as the core PCR + International EPD System Product Category Rules – PCR for constructions products, Acoustical ceiling and wall solutions (c-PCR-014; appendix to PCR 2019:14). EPD of construction products may not be comparable if they do not comply with EN 15804.</p> |
| Validity                                    | 2029-01-29                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Content of the declaration                  | <p>This is an environmental product declaration containing environmental information of the Ecophon product Hygiene Performance A/VLX</p> <p>Supplemental product information can be found at <a href="http://www.ecophon.com">www.ecophon.com</a></p>                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Issued date                                 | 2024-01-29                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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**Independent third-party verifier:**

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IVL

# PRODUCT DESCRIPTION

Product description and description of use:

This Environmental Product Declaration (EPD) describes the environmental impact of 1 m<sup>2</sup> of acoustic ceiling with the intended use to increase sound absorption in a room to create a better indoor environment.

The EPD covers products produced at Ecophon production site in Sweden (Hyllinge). Ecophon ceilings consists of a high-quality glass wool in different densities and thicknesses. The glass wool is covered with a painted or woven surface layer and cut into panels of different sizes and edge designs.

The structure of glass wool gives the material excellent sound energy absorption properties. Sound absorption is the main function of acoustic glass wool panels. The panels are also light, stable, and easy to handle and cut.



Acoustic glass wool panels are commonly used in schools, offices, and health care facilities where there is a need for noise reduction to improve the indoor environment. The acoustic panels need no maintenance and do not age. They can last as long as the building itself. For aesthetic reasons, normal room surface cleaning is advised.

Description of the main product components and materials for 1 m<sup>2</sup> of product:

| Parameter         | Value   | Post-consumer recycled content |
|-------------------|---------|--------------------------------|
| Product thickness | 20 mm   | -                              |
| Glass wool        | 69%     | 70%                            |
| Waterborne paint  | 5%      | -                              |
| Glass tissue      | 24%     | -                              |
| Waterborne glue   | 5%      | -                              |
| Plastic wrapping  | 0,019 g | -                              |

The total weight of the product is calculated to 1,6 kg / m<sup>2</sup>. The product does not contain any biogenic carbon. The packaging contains 0,0465 kg C / m<sup>2</sup>.

All raw materials contributing more than 5% to any environmental impact are listed in the table above. At the date of issue of this environmental declaration, there is no substance of very high concern (SVHC) in concentration above 0.01% by weight.

If there in future occur production changes that generate an increased impact larger than 10% the EPD will be updated and re-verified.

## OTHER ENVIRONMENTAL INDICATORS

Regarding the indoor environment, the Hygiene Performance A/VLX product are certified for or fulfil regulations according to the following table:

| Certificate and Regulations      |
|----------------------------------|
| French VOC A+                    |
| Eurofins Indoor Air Comfort Gold |



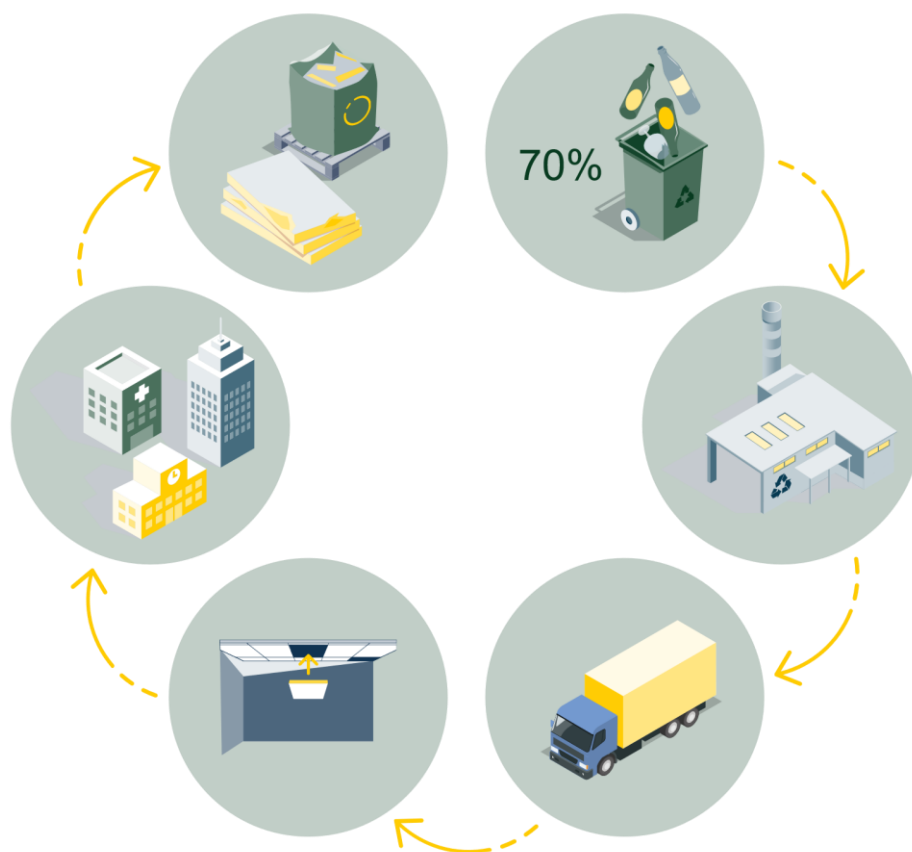
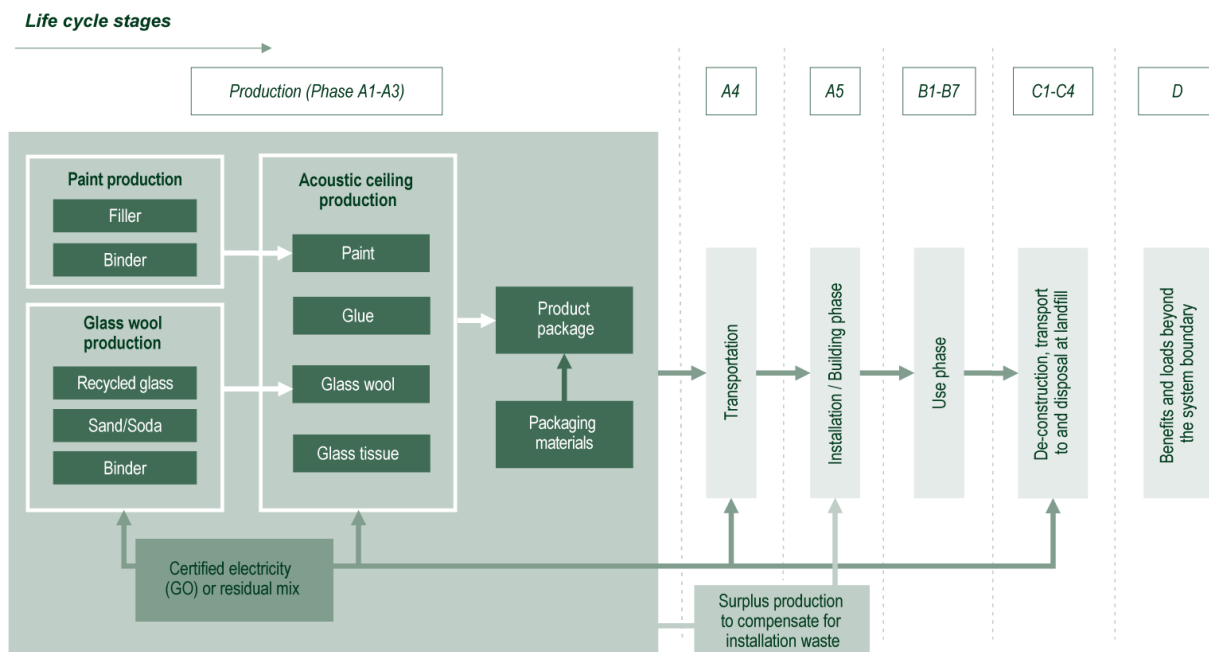
## LCA CALCULATION INFORMATION

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Declared unit                         | 1m <sup>2</sup> of acoustic ceiling panel.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Functional unit                       | 1m <sup>2</sup> acoustic ceiling with sound absorption class A installed at an ODS of 200mm according to ISO 354.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| System boundaries                     | Cradle to grave: A1-A3, A4-A5, B, C1-C4 and D<br>This EPD covers the environmental impact of acoustic panels without grid or suspension system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Reference Service Life (RSL)          | 50 years                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Cut-off rules                         | <p>The use of cut-off criterion on mass inputs and primary energy at the unit process level (1%) and at the information module level (5%).</p> <p>Flows related to human activities such as employee transport are excluded.</p> <p>Biogenic carbon storage is not accounted for in the LCA result related to GWP but included in "Use of renewable primary energy used as raw materials".</p> <p>The construction of plants, production of machines and transportation systems are excluded since the related flows are supposed to be negligible compared to the production of the building product when compared at these systems lifetime level.</p> |
| Allocations                           | Allocation criteria are based on mass in manufacturing (A3).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Geographical coverage and time period | For A1-A3: Global<br>For A4: European covering (2019)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

According to EN 15804, EPD of construction products might not be comparable if they do not comply with this standard. According to ISO 21930, EPD's might not be comparable if they are from different EPD administrating schemes.

# LIFE CYCLE STAGES

## Flow diagram of the Life Cycle



## Product stage, A1-A3

Description of the stage:

The product stage of the glass wool products is divided into 3 modules: A1 “Raw material and supply”, A2 “Transport to the manufacturer” and A3 “Manufacturer”. The aggregation of the modules A1, A2 and A3 is a possibility considered by the EN 15 804 standard. This rule is applied in this EPD.

### A1 Raw material supply

This module takes into account the extraction and processing of all raw materials and energy which occur upstream to the studied manufacturing process. Specifically, the glass wool raw material supply covers production of the binder components and sourcing (quarry) of raw materials for fiber production, e.g. sand and borax. Besides these raw materials, recycled materials (glass cullet) are also used as input.

Other major raw materials (paint, glass tissue and glue) are mainly modelled with specific data. Manufacturing of glass wool accounts for either GOs (Guarantee of Origins), or residual mix, and all other processes use residual mix.

### A2 Transport to the manufacturer

The raw materials are transported to the manufacturing site. In our case, the modelling includes: road, boat or train transportations (average values) of each raw material.

### A3 Manufacturing

Mineral wool ceiling panels are produced in a continuous online process starting with applying glass tissue on the mineral wool baseboard. The panels are cut into correct size and the edges of the panels are painted. After drying the panels are packed in cardboard boxes. The manufacturing of ceilings accounts for GOs or residual mix. The emission factors for the electricity usage at the different plants are presented in the table.

| Location               | Electricity emission factor<br>[gCO <sub>2</sub> eq./kWh] |
|------------------------|-----------------------------------------------------------|
| <b>Hyllinge (SE)</b>   | 4                                                         |
| <b>Naestved (DK)</b>   | 4                                                         |
| <b>Gliwice (PL)</b>    | 850                                                       |
| <b>Forssa (FI)</b>     | 4                                                         |
| <b>Genouillac (FR)</b> | 56                                                        |

Manufacturing covers all processes linked to production, which comprises various related operations besides on-site activities such as grinding, painting and drying, packaging and internal transportation. Packaging-related flows in the production process and all up-stream packaging are included in the manufacturing module, i.e. wooden pallets, cardboard and PE-film.

## Construction process stage, A4-A5

The construction process is divided into 2 modules: A4 "Transport to the building site" and A5 "Installation in the building".

Description of scenarios and additional technical information:

### A4 Transport to the building site

This module includes transport from the production gate to the building site. Transport is calculated based on a scenario with the parameters described in the following table. The transports represent a product weighted average transport from the sites to Brussels.

| Parameter                                                                            | Value                                                                               |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Fuel type, consumption of fuel and vehicle or vehicle type used for transport</b> | Average truck trailer with a 24t payload, diesel consumption 31.7 litres for 100 km |
| <b>Distance</b>                                                                      | 475 km (based on transports in 2019)                                                |
| <b>Capacity utilisation (including empty returns)</b>                                | 90% of the capacity in volume<br>100% of empty returns                              |
| <b>Bulk density of transported products (if available)</b>                           | 50 - 120 kg/m <sup>3</sup>                                                          |
| <b>Volume capacity utilisation factor (if available)</b>                             | 0.45                                                                                |

The transport distance has been calculated from a European average transport for Ecophon in 2019 from the parameters in the table above.

### A5:1 Installation in the building

This module includes waste of products during the implementation, i.e. the additional production processes to compensate the loss and the waste processing which occur in this stage.

Scenarios used for quantity of product wastage and waste processing are:

| Parameter                                                                                                                                                  | Value                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Waste of materials on the building site before waste processing, generated by the product's installation                                                   | 5%                                                                          |
| Output materials (specified by type) as results of waste processing at the building site e.g. of collection for recycling, for energy recovering, disposal | Packaging waste is 100 % landfilled.<br>Ceiling panel losses are landfilled |

### A5:2 Energy usage

As a general figure the time to install 1 m<sup>2</sup> ceiling is considered to be 20 minutes. During this time the installer is considered to use handheld appliances for about 5% of this time which in this case results in 1 minute. A handheld device such as a cordless screwdriver is considered to have a power of 0.7 kilowatt. Therefore, in one minute it will consume a total energy of  $0.7 \times 60 = 4.2$  kilojoule = 0.0042 MJ, per m<sup>2</sup> ceiling. In this context it is a negligible contribution and will not be part of the LCA calculation (lower than 0.1% of the total energy consumption).

## Use stage (excluding potential savings), B1-B7

Description of the stage:

The use stage is divided into 7 modules, B1 "Use", B2 "Maintenance", B3 "Repair", B4 "Replacement", B5 "Refurbishment", B6 "Operational energy use", B7 "Operational water use"

Description of scenarios and additional technical information:

Once installation is complete, no actions or technical operations are required during the use stages until the end of life stage. Therefore, acoustic ceiling panels have no impact (excluding potential energy savings) on this stage.

## End-of-life stage C1-C4

Description of the stage:

The end-of life stage is divided into 4 modules; C1 "De-construction, demolition", C2 "Transport to waste processing", C3 "Waste processing for reuse, recovery and/or recycling", C4 "Disposal".

Description of scenarios and additional technical information:

C1, De-construction, demolition

The dismantling of acoustic ceiling panels takes part during renovation or demolition of the building. In this case, the environmental impact is assumed to be very small and can be neglected.

C2, Transport to waste processing

The model for transportation (see A4, Transportation to the building site) is applied.

C3, Waste processing for reuse, recovery and/or recycling;

The product is considered to be landfilled without reuse, recovery or recycling.

C4, Disposal;

The product is assumed to be 100% landfilled.

| Parameter                                                  | Value/description                                                                                                   |
|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Collection process specified by type                       | 1,6 kg of acoustic ceiling (collected with mixed construction waste)                                                |
| Recovery system specified by type                          | No reuse, recycling or energy recovery                                                                              |
| Disposal specified by type                                 | Landfill, 1,6 kg                                                                                                    |
| Assumptions for scenario development (e.g. transportation) | Average truck trailer with a 24t payload, diesel consumption 31.7 litres for 100 km<br>50 km (distance to landfill) |

## Reuse/recovery/recycling potential, D

No benefits beyond system boundary, this module is declared as zero.

## LCA RESULTS

LCA model, aggregation of data and environmental impact are calculated through the GaBi Professional software. Secondary data is mainly taken from Ecoinvent 3.6 with some GaBi datasets.

Raw materials and energy consumption, as well as transport distances have been taken directly from the manufacturing plants of Saint-Gobain Ecophon in 2022.

Modules declared, geographical scope, share of specific data, and variation between sites (last two percentages given in GWP indicator) are stated in the following table. For stages A1-A3 (largest contribution to total GWP), the raw materials are modelled with very low amount of generic data.

|                  | Product phase                           |                                         |               | Construction process phase     |                              | Use phase |             |        |             |               |                        |                       | End of life phase          |                               |                  |             | Resource recovery phase            |
|------------------|-----------------------------------------|-----------------------------------------|---------------|--------------------------------|------------------------------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-------------------------------|------------------|-------------|------------------------------------|
|                  | Raw material and supply                 | Transport to the manufacturer           | Manufacturing | Transport to the building site | Installation in the building | Use       | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport to waste processing | Waste processing | Disposal    | Reuse-Recovery-Recycling-potential |
| Module           | A1                                      | A2                                      | A3            | A4                             | A5                           | B1        | B2          | B3     | B4          | B5            | B6                     | B7                    | C1                         | C2                            | C3               | C4          | D                                  |
| Modules declared | X                                       | X                                       | X             | X                              | X                            | x         | X           | X      | X           | X             | X                      | X                     | X                          | X                             | X                | X           | MND                                |
| Geography        | SE, BE, FR, DK, PL, DE, FI, GB, EU, GLO | SE, BE, FR, DK, PL, DE, FI, GB, EU, GLO | SE            | GB, EU, GLO                    | EU, GLO                      |           |             |        |             |               |                        |                       | GB, EU, GLO                | GB, EU, GLO                   | GB, EU, GLO      | GB, EU, GLO | -                                  |
| Specific data    | > 95 %                                  |                                         |               | -                              |                              |           |             |        |             |               |                        |                       |                            |                               |                  |             | -                                  |
| Variation sites  | 0%                                      |                                         |               | -                              |                              |           |             |        |             |               |                        |                       |                            |                               |                  |             | -                                  |

Summary of the LCA results are detailed in the tables below.

All results in the EPD are written in logarithmic base of ten. Reading example:  
 $5.2E-03 = 5.2 \cdot 10^{-3} = 0,0052$ .

# ENVIRONMENTAL IMPACT

| Environmental impacts                                                                                                                          |               |                            |          |           |                   |          |          |          |                            |
|------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------------|----------|-----------|-------------------|----------|----------|----------|----------------------------|
| Parameters                                                                                                                                     | Product stage | Construction process stage |          | Use stage | End-of-life stage |          |          |          | Reuse, recovery, recycling |
|                                                                                                                                                | A1–A3         | A4                         | A5       | B1–B7     | C1                | C2       | C3       | C4       | D                          |
|  Climate change - total [kg CO2 eq.]                          | 4.47E+00      | 1.66E-01                   | 4.20E-01 | 0.00E+00  | 0.00E+00          | 4.09E-03 | 0.00E+00 | 3.60E-02 | 0.00E+00                   |
|  Climate change - fossil [kg CO2 eq.]                         | 4.64E+00      | 1.66E-01                   | 2.49E-01 | 0.00E+00  | 0.00E+00          | 4.09E-03 | 0.00E+00 | 3.60E-02 | 0.00E+00                   |
|  Climate change - biogenic [kg CO2 eq.]                       | -1.71E-01     | 0.00E+00                   | 1.71E-01 | 0.00E+00  | 0.00E+00          | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00                   |
|  Climate change - land use and land use change [kg CO2 eq.]   | 2.43E-03      | 1.57E-05                   | 1.23E-04 | 0.00E+00  | 0.00E+00          | 3.87E-07 | 0.00E+00 | 3.25E-05 | 0.00E+00                   |
|  Ozone depletion [kg CFC 11 eq.]                              | 3.61E-08      | 2.07E-14                   | 1.80E-09 | 0.00E+00  | 0.00E+00          | 5.12E-16 | 0.00E+00 | 5.38E-17 | 0.00E+00                   |
|  Acidification [Mole of H+ eq.]                               | 4.56E-03      | 2.23E-04                   | 2.56E-04 | 0.00E+00  | 0.00E+00          | 5.50E-06 | 0.00E+00 | 1.08E-04 | 0.00E+00                   |
|  Eutrophication, freshwater [kg P eq.]                        | 3.75E-04      | 5.42E-08                   | 2.09E-05 | 0.00E+00  | 0.00E+00          | 1.34E-09 | 0.00E+00 | 6.55E-06 | 0.00E+00                   |
|  Eutrophication, marine [kg N eq.]                           | 7.65E-03      | 1.37E-04                   | 4.13E-04 | 0.00E+00  | 0.00E+00          | 3.38E-06 | 0.00E+00 | 8.88E-05 | 0.00E+00                   |
|  Eutrophication, terrestrial [Mole of N eq.]                | 1.50E-01      | 1.51E-03                   | 7.68E-03 | 0.00E+00  | 0.00E+00          | 3.73E-05 | 0.00E+00 | 4.72E-04 | 0.00E+00                   |
|  Photochemical ozone formation, human health [kg NMVOC eq.] | 2.15E-02      | 2.90E-04                   | 1.14E-03 | 0.00E+00  | 0.00E+00          | 7.15E-06 | 0.00E+00 | 2.21E-04 | 0.00E+00                   |
|  Resource use, mineral and metals [kg Sb eq.]               | 8.86E-06      | 9.02E-09                   | 4.43E-07 | 0.00E+00  | 0.00E+00          | 2.22E-10 | 0.00E+00 | 1.06E-09 | 0.00E+00                   |
|  Resource use, fossils [MJ]                                 | 5.78E+01      | 2.27E+00                   | 3.06E+00 | 0.00E+00  | 0.00E+00          | 5.59E-02 | 0.00E+00 | 2.93E-01 | 0.00E+00                   |

# RESOURCE USE

| Parameters                                                                                                                                                                                        | Resource use  |                            |           |           |                   |          |          |          |                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------------|-----------|-----------|-------------------|----------|----------|----------|----------------------------|
|                                                                                                                                                                                                   | Product stage | Construction process stage |           | Use stage | End-of-life stage |          |          |          | Reuse, recovery, recycling |
|                                                                                                                                                                                                   | A1–A3         | A4                         | A5        | B1–B7     | C1                | C2       | C3       | C4       | D                          |
|  Use of renewable primary energy excluding renewable primary energy resources used as raw materials [MJ]         | 1.24E+01      | 5.78E-02                   | 6.23E-01  | 0.00E+00  | 0.00E+00          | 1.43E-03 | 0.00E+00 | 1.86E-02 | 0.00E+00                   |
|  Use of renewable primary energy used as raw materials [MJ]                                                      | 1.87E+00      | 0.00E+00                   | -1.87E+00 | 0.00E+00  | 0.00E+00          | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00                   |
| Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) [MJ]                                                                          | 1.43E+01      | 5.78E-02                   | -1.25E+00 | 0.00E+00  | 0.00E+00          | 1.43E-03 | 0.00E+00 | 1.86E-02 | 0.00E+00                   |
|  Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material [ MJ] | 5.73E+01      | 2.27E+00                   | 3.04E+00  | 0.00E+00  | 0.00E+00          | 5.61E-02 | 0.00E+00 | 2.93E-01 | 0.00E+00                   |
|  Use of non-renewable primary energy used as raw materials [MJ]                                                  | #####         | 0.00E+00                   | -8.68E-02 | 0.00E+00  | 0.00E+00          | 0.00E+00 | 0.00E+00 | 1.83E+00 | 0.00E+00                   |
| Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) [MJ]                                                                      | 5.56E+01      | 2.27E+00                   | 2.95E+00  | 0.00E+00  | 0.00E+00          | 5.61E-02 | 0.00E+00 | 2.12E+00 | 0.00E+00                   |
|  Use of secondary material [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                   |
|  Use of renewable secondary fuels [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                   |
|  Use of non-renewable secondary fuels [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                   |
|  Use of net fresh water [m³]                                                                                   | 9.77E-03      | 1.45E-05                   | 4.81E-04  | 0.00E+00  | 0.00E+00          | 3.58E-07 | 0.00E+00 | 7.65E-06 | 0.00E+00                   |

The energy stored in material leave system boundary at end-of-life and is therefore negative in C4, and zero over the life-cycle. In accordance with option A as presented in PCR 2019:14.

## WASTE CATEGORIES

| Waste categories                                                                                                    |               |                            |          |           |                   |          |          |          |                            |
|---------------------------------------------------------------------------------------------------------------------|---------------|----------------------------|----------|-----------|-------------------|----------|----------|----------|----------------------------|
| Parameters                                                                                                          | Product stage | Construction process stage |          | Use stage | End-of-life stage |          |          |          | Reuse, recovery, recycling |
|                                                                                                                     | A1–A3         | A4                         | A5       | B1–B7     | C1                | C2       | C3       | C4       | D                          |
|  Hazardous waste disposed [kg]     | 4.30E-08      | 0.00E+00                   | 2.15E-09 | 0.00E+00  | 0.00E+00          | 0.00E+00 | 0.00E+00 | 1.46E-11 | 0.00E+00                   |
|  Non-hazardous waste disposed [kg] | 1.14E+00      | 0.00E+00                   | 1.40E-01 | 0.00E+00  | 0.00E+00          | 0.00E+00 | 0.00E+00 | 1.60E+00 | 0.00E+00                   |
|  Radioactive waste disposed [kg]   | 1.01E-03      | 0.00E+00                   | 5.07E-05 | 0.00E+00  | 0.00E+00          | 0.00E+00 | 0.00E+00 | 1.45E-06 | 0.00E+00                   |

## OUTPUT FLOW

| Output flows                                                                                                           |               |                            |          |           |                   |          |          |          |                            |
|------------------------------------------------------------------------------------------------------------------------|---------------|----------------------------|----------|-----------|-------------------|----------|----------|----------|----------------------------|
| Parameters                                                                                                             | Product stage | Construction process stage |          | Use stage | End-of-life stage |          |          |          | Reuse, recovery, recycling |
|                                                                                                                        | A1–A3         | A4                         | A5       | B1–B7     | C1                | C2       | C3       | C4       | D                          |
|  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                   |
|  Materials for recycling [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                   |
|  Materials for energy recovery [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                   |
|  Exported energy [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                   |

## ADDITIONAL VOLUNTARY INDICATORS FROM EN 15804

| Environmental impacts                                                                                                 |               |                            |          |           |                   |          |          |          |                            |
|-----------------------------------------------------------------------------------------------------------------------|---------------|----------------------------|----------|-----------|-------------------|----------|----------|----------|----------------------------|
| Parameters                                                                                                            | Product stage | Construction process stage |          | Use stage | End-of-life stage |          |          |          | Reuse, recovery, recycling |
|                                                                                                                       | A1–A3         | A4                         | A5       | B1–B7     | C1                | C2       | C3       | C4       | D                          |
|  GWP-GHG<br>[kg CO <sub>2</sub> eq.] | 4.64E+00      | 1.66E-01                   | 2.49E-01 | 0.00E+00  | 0.00E+00          | 4.09E-03 | 0.00E+00 | 3.60E-02 | 0.00E+00                   |

GWP-GHG is calculated with the same characterisation factors as in EN 15804+A2 (EF 3.1), but uptake and release of biogenic carbon dioxide is zero.

## APPENDIX: ENVIRONMENTAL IMPACTS ACCORDING TO EN 15804:2012+A1

| Parameters                                                                                                                                                              | Product stage | Construction process stage |          | Use stage | End-of-life stage |           |          |          | Reuse, recovery, recycling |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------------|----------|-----------|-------------------|-----------|----------|----------|----------------------------|
|                                                                                                                                                                         | A1–A3         | A4                         | A5       | B1–B7     | C1                | C2        | C3       | C4       | D                          |
|  Global Warming Potential (GWP)<br>[kg CO <sub>2</sub> eq.]                            | 1.54E+00      | 1.64E-01                   | 1.46E-01 | 0.00E+00  | 0.00E+00          | 4.04E-03  | 0.00E+00 | 1.96E-01 | 0.00E+00                   |
|  Ozone Depletion Potential (ODP)<br>[kg R11 eq.]                                       | 3.61E-08      | 2.07E-14                   | 1.80E-09 | 0.00E+00  | 0.00E+00          | 5.12E-16  | 0.00E+00 | 5.38E-17 | 0.00E+00                   |
|  Acidification potential (AP)<br>[kg SO <sub>2</sub> eq.]                              | 4.56E-03      | 2.23E-04                   | 2.56E-04 | 0.00E+00  | 0.00E+00          | 5.50E-06  | 0.00E+00 | 1.08E-04 | 0.00E+00                   |
|  Eutrophication potential (EP)<br>[kg (PO <sub>4</sub> ) <sup>3</sup> eq.]             | 1.50E-03      | 4.72E-05                   | 1.60E-04 | 0.00E+00  | 0.00E+00          | 1.16E-06  | 0.00E+00 | 2.59E-04 | 0.00E+00                   |
|  Photochemical ozone creation<br>(POPC)[Ethene eq.]                                    | 4.15E-04      | -6.55E-05                  | 3.70E-05 | 0.00E+00  | 0.00E+00          | -1.62E-06 | 0.00E+00 | 6.51E-05 | 0.00E+00                   |
|  Abiotic depletion potential<br>for non-fossil resources<br>(ADP-elements) [kg Sb eq.] | 4.21E-06      | 9.04E-09                   | 2.11E-07 | 0.00E+00  | 0.00E+00          | 2.23E-10  | 0.00E+00 | 1.07E-09 | 0.00E+00                   |
|  Abiotic depletion potential<br>for fossil resources<br>(ADP-fossil fuels) [MJ/FU]     | 1.26E+01      | 2.23E+00                   | 8.00E-01 | 0.00E+00  | 0.00E+00          | 5.51E-02  | 0.00E+00 | 2.89E-01 | 0.00E+00                   |

Aggregation of Global Warming Potential (GWP) results from A1 to C4,  
according to EN 15804:2012+A1: 2,04594 kg CO<sub>2</sub> eq. / m<sup>2</sup>.



## REFERENCE LIST

**ISO 354:2003:** Acoustics – Measurement of sound absorption in a reverberation room

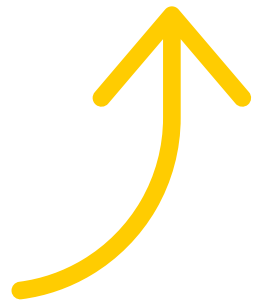
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**EN 15804:2012+A2:2019:** Sustainability of construction works  
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