



ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2006 and
EN 15804:2012+A2:2019/AC:2021 for:

Ventilam Alu Plus/ ML-3 Plus 20-50mm

Version 1

Date of publication: 2024/08/01

Validity: 5 years

Valid until: 2029/07/31

**Scope of the EPD®: Poland
EPD of multiple product based on
a representative product**



THE INTERNATIONAL EPD® SYSTEM

The International EPD® System

Program operator: EPD international AB

Registration number: EPD-IES-0014466



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

LCI data is not yet based on 1 year of production

Programme information

PROGRAMME: The International EPD® System
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CEN standard EN 15804:2012 + A2:2019/AC:2021 serves as the Core Product Category Rules (PCR)

Product category rules (PCR): PCR 2019:14 Construction Products, version 1.3.4

Complementary PCR: (c-PCR-005), 2019-12-20. Thermal insulation products (EN 16783:2017)

PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members.

President: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact - Contact via info@environdec.com

LCA accountability: Gabriela Kania; Gabriela.Kania@saint-gobain.com,
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Independent third-party verification of the declaration and data, according to ISO 14025:2006:

EPD verification by individual verifier

Third party verifier: Joanna Zhuravlova, Bureau Veritas Polska

joanna.zhuravlova@bureauveritas.com

Approved by: The International EPD© System

Procedure for follow-up of data during EPD validity involves third part verifier: Yes No

EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same version number up to the first two digits) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical DU/FU); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of Comparison. For further information about comparability, see EN 15804:2012+A2:2019/AC:2021 and ISO 14025:2006.

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

Product information

Company information

Manufacturer: SAINT-GOBAIN CONSTRUCTION PRODUCTS POLSKA sp. z o.o

Production plant: SAINT-GOBAIN CONSTRUCTION PRODUCTS POLSKA sp. z o.o.

Isover, ul. Okrężna 16; 44-100 Gliwice PL

Management system-related certification: The manufacturer has implemented the principles of Factory Production Control (FPC). Certificate of consistency of Performance issued by notified body. The products have a declaration of performance in accordance with the requirements of the CPR and EN 14303 in System 1 and System 3 The Assessment and Verification of Constancy of Performance (AVCP)

Programme used: EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works – Environmental product declaration - core rules for the product category of construction product and The International EPD® System

PCR identification PCR 2019:14 version 1.3.4 for Construction products

Prepared by: IVL Swedish Environmental Research Institute, EPD International Secretariat

Owner of the declaration: SAINT-GOBAIN CONSTRUCTION PRODUCTS POLSKA sp. z o.o

UN CPC CODE: 37990 Non-metallic mineral products n.e.c. (including mineral wool, expanded mineral materials, worked mica, articles of mica, non-electrical articles of graphite or other carbon and articles of peat)

Product name and manufacturer represented: Ventilam Alu Plus/ ML-3 Plus - SAINT-GOBAIN CONSTRUCTION PRODUCTS POLSKA sp. z o.o

EPD® prepared by: Katarzyna.malczak@saint-gobain.com Gabriela.kania@saint-gobain.com and Joffrey.martin@saint-gobain.com (Saint-Gobain LCA central team)

The intended use of this EPD is for B2B communication.

Geographical scope of the EPD®: Poland

EPD® registration number: EPD-IES-0014466

Declaration issued: 2024/08/01 valid until: 2029/07/31

Demonstration of verification: An independent verification of the declaration was made, according to ISO 14025:2010. This verification was external and conducted by the following third party based on the PCR mentioned above.

Product description

Product description and description of use

This Environmental Product Declaration (EPD®) describes the environmental impacts of 1 m² of mineral wool with a Thermal conductivity in 10⁰ C - 0.038 W/(m·K) of Ventilam Alu Plus/ ML-3 Plus To calculate the impact of the range of commercial thicknesses between 20 mm and 50 mm, see the table "influence of particular thickness". in additional information section.

Despite the differences in characteristics and thickness, these products share same material and are manufactured at a single site in Poland by Isover. They follow identical core processes, leading to an expected similarity in their environmental impact per unit weight. The production volume of Ventilam Alu Plus/ ML-3 Plus 50 mm was the highest.

This EPD applies for one specific product produced in one single plant of Saint-Gobain Construction Product Polska Sp. z o.o.

The production site of Saint-Gobain Construction Product Polska Sp. z o.o.in Gliwice uses natural raw materials (sand), recycled glass cullet, and fusion and fiberizing techniques to produce glass wool. The products are obtained in the form of a "mineral wool mat" characterized with a soft and airy structure.

Ventilam Alu Plus/ ML-3 Plus is self-adhesive glass wool mat covered on one side with reinforced aluminum foil. External anti-condensation, thermal and acoustic insulation of round and rectangular ventilation ducts (HVAC).

Other uses:

- pipeline insulation,
- insulation of tanks and cisterns,
- insulation of heat exchangers
- protection of water installations (hydrants, pipelines, tanks, valves) against freezing in winter.
- The adhesive layer allows to shorten the assembly time and eliminates the need to use additional assembly elements

LCI data is not yet based on 1 year of production

Justification for grouping of products:

Despite the differences in characteristics and thickness, these products share same material and are manufactured at a single site in Poland by Isover. They follow identical core processes, leading to an expected similarity in their environmental impact per unit weight. The production volume of Ventilam Alu Plus/ ML-3 Plus 50 mm was the highest.

Technical data/physical characteristics:

| PARAMETER | VALUE / DESCRIPTION |
|-------------------------------------------|--------------------------|
| Thermal conductivity in 10 ⁰ C | 0.038 W/(m·K) (EN 12667) |
| Reaction to fire | A2-s1,d0 (EN 13501-1) |
| Density | 31,5 kg/m ³ |

Declaration of the main product components and/or materials

Description of the main components and/or materials:

| Product components | Weight (%) | Post-consumer material weight (%) | Biogenic material weight-kg C/product |
|-----------------------------------------------------|---------------|-----------------------------------|----------------------------------------|
| Mineral materials | 30 – 33 % | 0% | 0 |
| Recycled glass (external cullet) | 57 – 60 % | 0% | 0 |
| Additives | 2,5-3 % | 0% | 0 |
| Binder | 5,5-7,5% | 0% | 8,14E-03 |
| Facing | 0,8-1,2 % | 0% | 0 |
| Sum | 100% | 0% | 8,14E-03 |
| Packaging materials | Weight (%) | Weight-% (vs the product) | Biogenic material, weight-kg C/product |
| Wooden Pallet | 0,3-0,4 | 11 % | 1,49E-01 |
| Low-density polyethylene (LDPE) film with print | 0,003-0,004 | <1 % | 0 |
| Low-density polyethylene (LDPE) stretch film / hood | 0,02-0,03 | 1 % | 0 |
| Paper for Label | 0,0001-0,0002 | <1 % | 6,59E-04 |

At the date of issue of this declaration, there is no “Substance of Very High Concern” (SVHC) in concentration above 0.1% by weight, and neither do their packaging, following the European REACH regulation (Registration, Evaluation, Authorization and Restriction of Chemicals).

The verifier and the program operator do not make any claim nor have any responsibility of the legality of the product.

LCA calculation information

| | |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TYPE OF EPD | Cradle to grave and module D |
| FUNCTIONAL UNIT | Providing a thermal insulation on 1 m ² of product with a thermal conductivity of 0.038 W/(m·K) in 10 ⁰ C and a thickness of 50 mm during 50 years |
| SYSTEM BOUNDARIES | Cradle to grave (A1, A2, A3, A4, A5, B1–B7, C1–C4) and module D |
| REFERENCE SERVICE LIFE (RSL) | The Reference Service Life (RSL) of the insulation product is 50 years. This 50-year value is the amount of time that we recommend our products last for without refurbishment and corresponds to standard building design life. |
| CUT-OFF RULES | In the case that there is not enough information, the process energy and materials representing less than 1% of the whole energy and mass used can be excluded (if they do not cause significant impacts). The addition of all the inputs and outputs excluded cannot be bigger than the 5% of the whole mass and energy used, as well of the emissions to environment occurred. Flows related to human activities such as employee transport are excluded. 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. |

ALLOCATIONS

Allocation has been avoided when possible and when not possible a mass allocation has been applied.

The polluter pays and the modularity principles as well have been followed.

| | |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GEOGRAPHICAL COVERAGE AND TIME PERIOD | Scope: Poland Data is collected from one site production site SAINT-GOBAIN CONSTRUCTION PRODUCTS POLSKA sp. z o.o. Isover, ul. Okrężna 16; 44-100 Gliwice PL located in Poland Data collected for the 10.2023-02.2024 |
| BACKGROUND DATA SOURCE | The databases Sphera 2023.2 and ecoinvent v.3.9.1 |
| SOFTWARE | Sphera LCA for experts (GaBi) 10 |

LCA scope

System boundaries (X=included. MND=module not declared)

| | PRODUCT STAGE | | | CONSTRUCTION STAGE | | USE STAGE | | | | | | | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY |
|--------------------|---------------------|-----------|---------------|--------------------|-----------------------------------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|-----------------------------------------------|
| | Raw material supply | Transport | Manufacturing | Transport | Construction-Installation process | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-recovery |
| 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 | X |
| Geography | EU | EU | PL | PL | PL | PL | PL | PL | PL | PL | PL | PL | PL | PL | PL | PL | PL |
| Specific data used | >68% GWP-GHG | | | | | | | | | | | | | | | | |
| Variation products | -58% to +0% | | | | | | | | | | | | | | | | |
| Variation sites | 0% | | | | | | | | | | | | | | | | |

Life cycle stages



A1-A3, Product stage

The product stage of the mineral wool products is subdivided into 3 modules A1, A2 and A3 respectively “raw material supply”, “transport” and “manufacturing”.

A1, Raw materials supply

This module includes the extraction and transformation of raw materials.

A2, Transport to the manufacturer

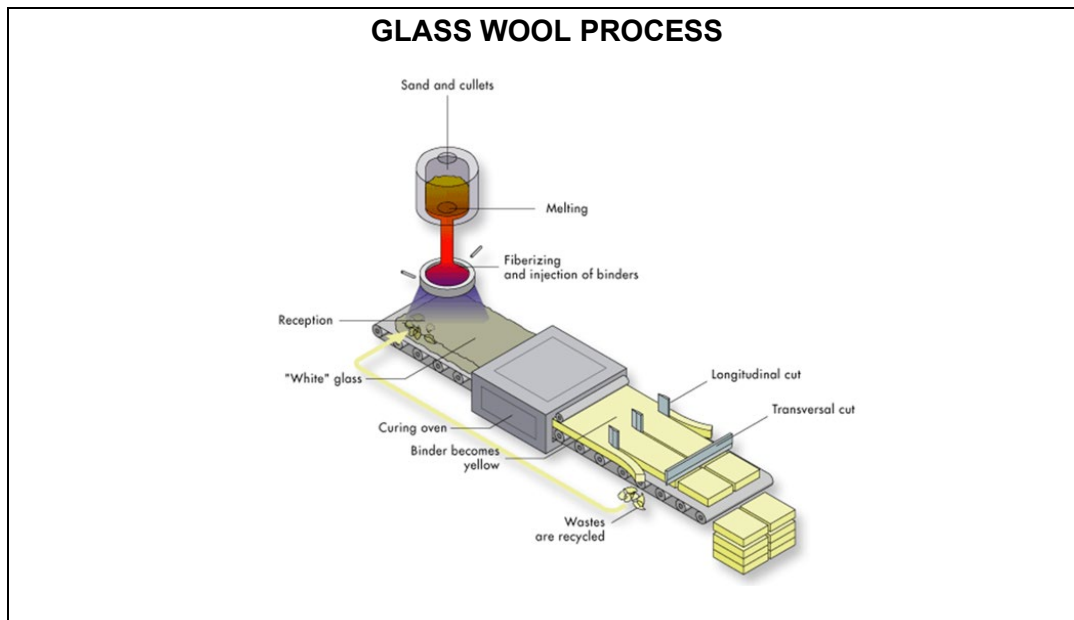
This module includes the transportation of raw materials and packaging to the manufacturing site. The modelling includes road transportations.

A3, Manufacturing

This module includes the manufacture of products such as (fusion, fiberizing, etc) and the manufacture of packaging. The production of packaging material is considered at this stage. The processing of any waste arising from this stage is also included.

Manufacturing process flow diagram

System diagram:



Manufacturing in detail:

Mineral wool is made from high-temperature molten glass that is blown away using centrifugal force to form fine cotton-like fibers.

Then, a binder is sprayed on the material to form it, and the product is heated in an oven.

A4-A5, Construction process stage

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

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.

| PARAMETER | VALUE |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat, etc. | Freight truck, maximum load weight of 27 t and consumption of 0.38 liters per km |
| Distance | 316 km |
| Capacity utilisation (including empty returns) | 100% of the capacity in volume 30% of empty returns |
| Bulk density of transported products | 25,5 kg/m ³ |
| Volume capacity utilisation factor | 1 |

A5, Installation in the building: this module includes the installation of the product manually and no additional accessories, nor energy are considered

| PARAMETER | VALUE/DESCRIPTION |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type) | 5 % |
| Distance | 10 km to landfill by truck |
| Output materials (specified by type) as results of waste processing at the building site e.g., of collection for recycling, for energy recovering, disposal (specified by route) | Product losses: 0,13 kg/m ² Pallet: 0,3-0,4 kg/m ² PE film: 0,02-0,03 kg/m ² |

B1-B7, Use stage (excluding potential savings)

The use stage is divided into the following modules:

- **B1:** Use
- **B2:** Maintenance
- **B3:** Repair
- **B4:** Replacement
- **B5:** Refurbishment
- **B6:** Operational energy use
- **B7:** Operational water use

The product has a reference service life of 50 years. This assumes that the product will last in situ with no requirements for maintenance, repair, replacement, or refurbishment throughout this period. Therefore, it has no impact at this stage.

C1-C4, End of Life Stage

This stage includes the following modules:

- **C1:** The de-construction and/or dismantling of the product takes part of the demolition of the entire building. In our case, the energy is considered is 0.05 MJ/kg.
- **C2:** Transport to waste processing
- **C3:** Waste processing for reuse, recovery and/or recycling
- **C4:** Waste disposal, including physical pre-treatment and site management.

Description of the scenarios and additional technical information for the end of life:

| PARAMETER | VALUE/DESCRIPTION |
|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Collection process specified by type | The entire product, including any facing is collected with mixed construction waste. 1,7 kg of mineral wool |
| Recovery system specified by type | There is no recovery, recycling or reuse of the product once it has reached its end of life phase. |
| Disposal specified by type | 1,7 kg of mineral wool are landfilled |
| Assumptions for scenario development (e.g. transportation) | The waste going to landfill is transported 10 km by truck from deconstruction/demolition sites to landfill |

D, Reuse/recovery/recycling potential

100% of wastes are landfilled. There is no reuse, nor recycling, nor incineration with energy recovery for the for the product nor its packaging.

Considering all the above, no benefits or loads are reported on stage D.

LCA results

As specified in EN 15804:2012+A2:2019/AC:2021 and the Product-Category Rules, the environmental impacts are declared and reported using the baseline characterization factors are from the ILCD. Raw materials and energy consumption, as well as transport distances have been taken directly from the manufacturing plant. Characterisation factors EN15804 based on EF 3.1.

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.














All emissions to air, water, and soil, and all materials and energy used have been included.

The results of the impact categories abiotic depletion of minerals and metals, land use, human toxicity (cancer), human toxicity, noncancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/infrastructure in generic datasets, in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.

This EPD including module C, we strongly advise against using the results of modules A1-A3 without considering the results of module C.











Results refer to a functional unit of 1 m² of mineral wool with thermal resistance of a thermal conductivity of 0,038 W/(m·K) (in 10 °C) for a thickness of 50 mm. To obtain results with different commercial thicknesses see additional information section.

Environmental Impacts

| Environmental indicators | PRODUCT STAGE | CONSTRUCTION STAGE | | USE STAGE | | | | | | | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------|-----------------|-----------|----------------|-----------|----------------|------------------|---------------------------|--------------------------|--------------------------------|--------------|---------------------|-------------|------------------------------------------|
| | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Operational energy use | B7 Operational water use | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | D Reuse, recovery, recycling |
|  Climate Change [kg CO2 eq.] | 3,56E+00 | 3,94E-02 | 7,38E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 5,31E-03 | 0 | 3,03E-02 | 0 |
|  Climate Change (fossil) [kg CO2 eq.] | 4,15E+00 | 3,84E-02 | 2,18E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 5,18E-03 | 0 | 2,72E-02 | 0 |
|  Climate Change (biogenic) [kg CO2 eq.] | -3,49E-01 | 9,65E-04 | 5,20E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 1,30E-04 | 0 | 2,99E-03 | 0 |
|  Climate Change (land use change) [kg CO2 eq.] | 1,62E-03 | 2,25E-06 | 8,61E-05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 3,03E-07 | 0 | 7,83E-05 | 0 |
|  Ozone depletion [kg CFC-11 eq.] | 3,97E-07 | 5,68E-18 | 2,00E-08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 7,65E-19 | 0 | 1,01E-16 | 0 |
|  Acidification terrestrial and freshwater [Mole of H+ eq.] | 9,25E-03 | 2,27E-04 | 4,96E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 3,06E-05 | 0 | 1,95E-04 | 0 |
|  Eutrophication freshwater [kg P eq.] | 1,54E-04 | 7,40E-09 | 7,85E-06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 9,97E-10 | 0 | 4,68E-08 | 0 |
|  Eutrophication marine [kg N eq.] | 2,08E-03 | 1,12E-04 | 1,37E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 1,51E-05 | 0 | 5,03E-05 | 0 |
|  Eutrophication terrestrial [Mole of N eq.] | 2,22E-02 | 1,23E-03 | 1,25E-03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 1,66E-04 | 0 | 5,52E-04 | 0 |
|  Photochemical ozone formation - human health [kg NMVOC eq.] | 6,99E-03 | 2,11E-04 | 3,82E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 2,84E-05 | 0 | 1,52E-04 | 0 |
|  Resource use, mineral and metals [kg Sb eq.] ¹ | 9,71E-06 | 4,61E-10 | 5,00E-07 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 6,21E-11 | 0 | 2,44E-09 | 0 |
|  Resource use, energy carriers [MJ] ¹ | 5,66E+01 | 5,30E-01 | 2,91E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 7,15E-02 | 0 | 3,57E-01 | 0 |
|  Water deprivation potential [m ³ world equiv.] ¹ | 7,30E-01 | 3,75E-05 | 3,73E-02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 5,05E-06 | 0 | 2,85E-03 | 0 |









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

Resources Use


| Resources Use indicators | PRODUCT STAGE | CONSTRUCTION STAGE | | USE STAGE | | | | | | | END OF LIFE STAGE | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------|-----------------|-----------|----------------|-----------|----------------|------------------|---------------------------|--------------------------|--------------------------------|--------------|---------------------|------------------------------------------|------------------------------|
| | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Operational energy use | B7 Operational water use | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | D Reuse, recovery, recycling |
|  Use of renewable primary energy (PERE) [MJ] ² | 1,09E+01 | 1,29E-02 | 5,52E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,73E-03 | 0 | 4,68E-02 | 0 |
|  Primary energy resources used as raw materials (PERM) [MJ] ² | 6,11E+00 | 0,00E+00 | 3,05E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 0 | 0,00E+00 | 0 |
|  Total use of renewable primary energy resources (PERT) [MJ] ² | 1,70E+01 | 1,29E-02 | 8,57E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,73E-03 | 0 | 4,68E-02 | 0 |
|  Use of non-renewable primary energy (PENRE) [MJ] ² | 5,25E+01 | 5,32E-01 | 2,70E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7,17E-02 | 0 | 3,57E-01 | 0 |
|  Non-renewable primary energy resources used as raw materials (PENRM) [MJ] ² | 4,16E+00 | 0,00E+00 | 2,11E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 0 | 0,00E+00 | 0 |
|  Total use of non-renewable primary energy resources (PENRT) [MJ] ² | 5,66E+01 | 5,32E-01 | 2,91E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7,17E-02 | 0 | 3,57E-01 | 0 |
|  Input of secondary material (SM) [kg] | 1,20E+00 | 0 | 0,05992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 0 |
|  Use of renewable secondary fuels (RSF) [MJ] | 1,36E-20 | 0 | 6,79E-22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 0 |
|  Use of non-renewable secondary fuels (NRSF) [MJ] | 1,60E-19 | 0,00E+00 | 7,98E-21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 0 | 0,00E+00 | 0 |
|  Use of net fresh water (FW) [m3] | 2,14E-02 | 2,34E-06 | 1,09E-03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,15E-07 | 0 | 9,01E-05 | 0 |

² From EPD International Construction Product PCR 1.3.4 (Annex 3). The option B was retained to calculate the primary energy use indicators.



Waste Category & Output flows

| Waste Category & Output Flows | PRODUCT STAGE | CONSTRUCTION STAGE | | USE STAGE | | | | | | | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE |
|-----------------------------------------------------------------------------------------------------------------------------|---------------|--------------------|-----------------|-----------|----------------|-----------|----------------|------------------|---------------------------|--------------------------|--------------------------------|--------------|---------------------|-------------|------------------------------------------|
| | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Operational energy use | B7 Operational water use | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | D Reuse, recovery, recycling |
|  Hazardous waste disposed (HWD) [kg] | 2,13E-08 | 3,43E-11 | 1,39E-09 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 4,62E-12 | 0 | 5,446E-09 | 0 |
|  Non-hazardous waste disposed (NHWD) [kg] | 2,01E-01 | 1,08E-05 | 1,16E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 1,45E-06 | 0 | 1,796 | 0 |
|  Radioactive waste disposed (RWD) [kg] | 6,14E-04 | 6,03E-07 | 3,10E-05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8,131E-08 | 0 | 4,058E-06 | 0 |
|  Components for re-use (CRU) [kg] | 0,00E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  Materials for Recycling (MFR) [kg] | 6,08E-03 | 0 | 3,40E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  Material for Energy Recovery (MER) [kg] | 0,00E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  Exported electrical energy (EEE) [MJ] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  Exported thermal energy (EET) [MJ] | 0 | 0 | 0,00E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 0 |

Additional voluntary indicators from EN 15804

| Environmental indicators | PRODUCT STAGE | CONSTRUCTION STAGE | | USE STAGE | | | | | | | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE LIFE CYCLE |
|---------------------------------------------------------------------------------------------------------------------|---------------|--------------------|-----------------|-----------|----------------|-----------|----------------|------------------|-----------------------|--------------------------|--------------------------------|--------------|---------------------|-------------|------------------------------------------|
| | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Operational energy | B7 Operational water use | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | D Reuse, recovery, recycling |
|  GWP-GHG [kg CO2 eq.] ³ | 3,56E+00 | 3,94E-02 | 7,38E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 5,31E-03 | 0 | 3,03E-02 | 3,56E+00 |

Information on biogenic carbon content

| Biogenic Carbon Content | | PRODUCT STAGE |
|-------------------------------------------------------------------------------------|-------------------------------------------|---------------|
| | | A1 / A2 / A3 |
|  | Biogenic carbon content in product [kg] | 3,46E-03 |
|  | Biogenic carbon content in packaging [kg] | 1,49E-01 |

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2.

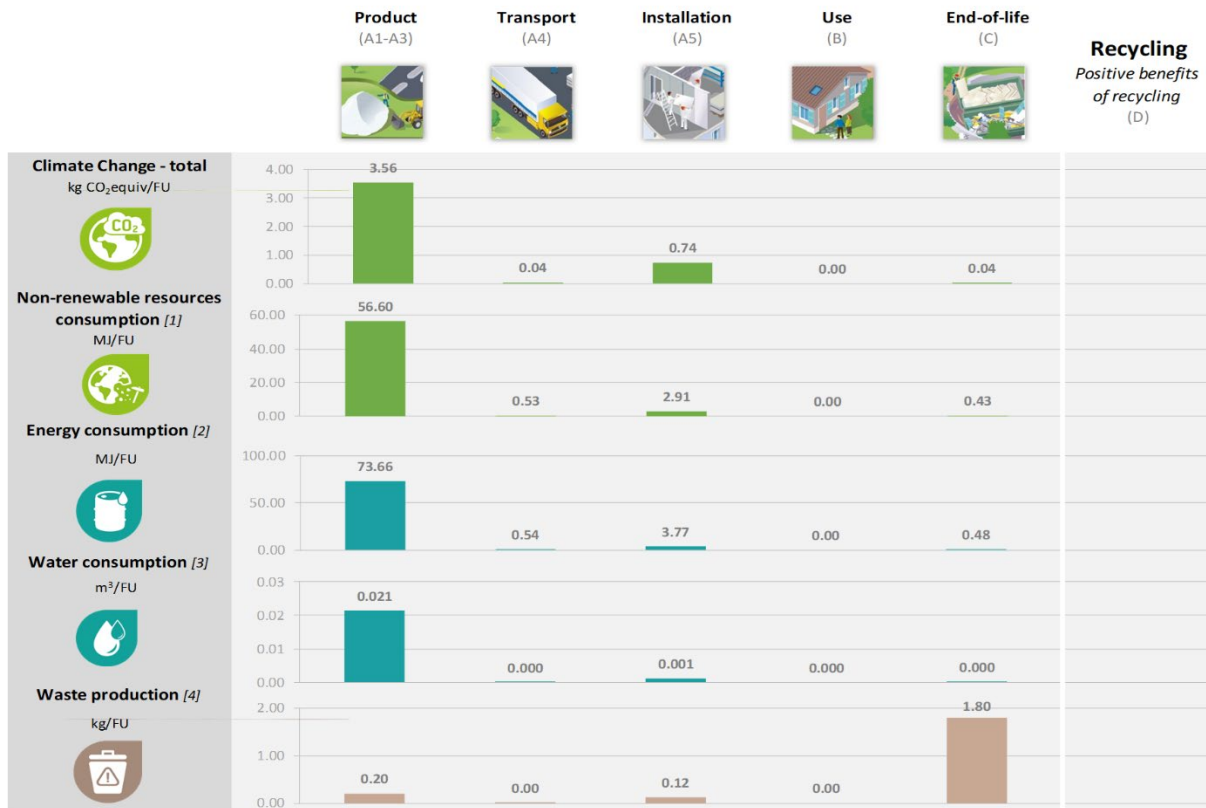
The product contains biogenic carbon due to the additives used. Regarding packaging, biogenic carbon is quantified due to wooden pallets production.

³ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO2 is set to zero.

Additional information:

LCA interpretation

The following results are given for the studied product : Ventilam Alu Plus/ML-3 Plus 50mm



[1] This indicator corresponds to the abiotic depletion potential of fossil resources.

[2] This indicator corresponds to the total use of primary energy.

[3] This indicator corresponds to the use of net fresh water.

[4] This indicator corresponds to the sum of hazardous, non-hazardous and radioactive waste disposed.

Variation impact indicator

| | max. | min | difference |
|-----------------------------------------------------------------------|----------|----------|------------|
| Climate Change [kg CO ₂ eq.] | 4,37E+00 | 2,12E+00 | 51% |
| Climate Change (fossil) [kg CO ₂ eq.] | 4,44E+00 | 2,28E+00 | 49% |
| Climate Change (biogenic) [kg CO ₂ eq.] | 1,75E-01 | 1,75E-01 | 0% |
| Climate Change (land use change) [kg CO ₂ eq.] | 1,79E-03 | 1,44E-03 | 20% |
| Ozone depletion [kg CFC-11 eq.] | 4,17E-07 | 1,74E-07 | 58% |
| Acidification terrestrial and freshwater [Mole of H ⁺ eq.] | 1,02E-02 | 6,04E-03 | 41% |
| Eutrophication freshwater [kg P eq.] | 1,62E-04 | 8,94E-05 | 45% |
| Eutrophication marine [kg N eq.] | 2,40E-03 | 1,39E-03 | 42% |
| Eutrophication terrestrial [Mole of N eq.] | 2,54E-02 | 1,46E-02 | 43% |
| Photochemical ozone formation - human health [kg NMVOC eq.] | 7,77E-03 | 4,56E-03 | 41% |
| Resource use, mineral and metals [kg Sb eq.] | 1,02E-05 | 5,38E-06 | 47% |
| Resource use, energy carriers [MJ] | 6,05E+01 | 3,55E+01 | 41% |
| Water scarcity [m ³ world equiv.] | 7,70E-01 | 4,26E-01 | 45% |

Influence of thicknesses

This EPD® includes the range of products with different thicknesses between 20 mm and 50 mm. A multiplication factor can be applied to obtain the environmental performance of every thickness. All the results of this EPD® refer to the reference thickness of 50 mm with a value of a thermal conductivity of 0,038 W/(m·K) (in 10 °C)

To obtain the environmental performance associated with every specific thickness, the results expressed in this EPD® must be multiplied by its corresponding multiplication factor.

| Ventilam Alu Plus/ ML-3 Plus | Thickness | | | | |
|------------------------------|-------------|-------------|-------------|-------------|-------------|
| | 20 mm | 25 mm | 30 mm | 40 mm | 50 mm |
| conversion factor | 0,51 | 0,59 | 0,67 | 0,84 | 1,00 |

Electricity information

| TYPE OF INFORMATION | DESCRIPTION |
|------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Location | Residual Mix for Poland |
| Geographical representativeness description | Share of energy sources Poland |
| Reference year | 2023 |
| Type of dataset | Cradle to gate from Gabi and ecoinvent databases |
| Source | Gabi 2023 and ecoinvent 3.9.1 databases or International Energy Agency (IEA) |
| CO₂ emission kg CO₂ eq. / kWh | 7,164E-01 kg of CO ₂ eq./kWh Based on Climate Change - total indicator |

The factory based in Gliwice uses electricity with Guarantee of Origin certificate (GO's). Hence, the electricity mix considered for the manufacturing of the studied product is modelled according to the electricity mix described in the Guarantee of Origin certificate. The amount of electricity purchased with GO's covers 6,3% of the electricity consumption on the manufacturing site.

Data quality

Inventory data quality is judged by geographical, temporal, and technological representativeness. To cover these requirements and to ensure reliable results, first-hand industry data crossed with LCA background datasets were used. The data was collected from internal records and reporting documents from the Plant. After evaluating the inventory, according to the defined ranking in the LCA report, the assessment reflects good inventory data quality.

Environmental impacts according to EN 15804:2012 + A1

The following tables presents results for 1 m² with a thermal conductivity of 0,038 W/(m·K) (in 10 °C) for a thickness of 50mm

| Environmental impacts | PRODUCT STAGE | CONSTRUCTION STAGE | | USE STAGE | | | | | | | END OF LIFE STAGE | | | | REUSE, RECOVERY, RECYCLING |
|---------------------------------------------------------------------------------|---------------|--------------------|-----------------|-----------|----------------|-----------|----------------|------------------|---------------------------|--------------------------|--------------------------------|--------------|---------------------|-------------|------------------------------|
| | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Operational energy use | B7 Operational water use | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | D Reuse, recovery, recycling |
| Global Warming Potential (GWP) [kg CO ₂ eq.] | 4,11E+00 | 3,80E-02 | 2,15E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,12E-03 | 0 | 2,67E-02 | 0 |
| Ozone depletion (ODP) [kg CFC 11eq.] | 4,47E-07 | 7,57E-18 | 2,25E-08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,02E-18 | 0 | 1,35E-16 | 0 |
| Acidification potential (AP) [kg SO ₂ eq.] | 7,70E-03 | 1,55E-04 | 4,10E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,10E-05 | 0 | 1,57E-04 | 0 |
| Eutrophication potential (EP) [kg (PO ₄) ₃ -eq.] | 2,61E-03 | 3,85E-05 | 1,37E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,18E-06 | 0 | 1,77E-05 | 0 |
| Photochemical ozone creation (POCP) - [kg Ethylene eq.] | 9,51E-04 | 4,71E-06 | 5,01E-05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6,34E-07 | 0 | 1,26E-05 | 0 |
| Abiotic depletion potential for non-fossil resources (ADP-elements) [kg Sb eq.] | 9,82E-05 | 4,81E-10 | 4,93E-06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6,48E-11 | 0 | 9,43E-09 | 0 |
| Abiotic depletion potential for fossil resources (ADP-fossil fuels) [MJ] | 5,40E+01 | 5,31E-01 | 2,77E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7,15E-02 | 0 | 3,47E-01 | 0 |

Differences versus previous versions

A previous version of EPD for this product was published on cenia.cz

Latest version uses latest version of PCR and standard and a new data collection was used

References

1. EN 15804:2012+A1:2013 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
2. EN 15804:2012+A2:2019/AC:2021 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
3. EN 16783:2017 Thermal insulation products - Product category rules (PCR) for factory made and in-situ formed products for preparing environmental product declarations
4. EPD International. General Program Instructions (GPI) for the International EPD® System (version 4.0) www.environdec.com.
5. The International EPD System PCR 2019:14 Construction products and Construction services. Version 1.3.4
6. European Chemical Agency, Candidate List of substances of very high concern for Authorization. <https://echa.europa.eu/candidate-list-table>
7. LCA report for VA and VA+ 06/2024