Linius horizontal continuous louvres system

Registration number: 20241241427 - Publication date: 02/2025 - Version: 1.1

Warning

The information contained in this declaration is provided under the responsibility of Renson (producer of the EPD) in accordance with NF EN 15804+A2 and the national supplement NF EN 15804+A2/CN.

Any use, in whole or in part, of the information provided in this document must at least be accompanied by the full reference of the original EPD and its producer, which will be able to provide a complete copy.

CEN standard EN 15804+A2 and the national supplement NF EN 15804+A2/CN serve as rules for defining product categories (PCR).

NOTE: The French translation of 'EPD (Environmental Product Declaration)' is 'DEP' (Déclaration Environnementale de Produit). However, in France, the term FDES (Fiche de Déclaration Environnementale et Sanitaire – Environmental and Health Declaration Sheet) is commonly used. It covers both the Environmental Declaration and the Health information for the product covered by the FDES. The FDES is therefore an 'EPD' supplemented by health information.

Reading guide

The following display rules apply:

- Values are expressed in simplified scientific notation: 0.0038 = 3.80 × 10-3 = 3.80E-3
- The units used are specified in front of each flow: the kilogram (kg), the gram (g), the kilowatt-hour (kWh), the megajoule (MJ), the square metre (m2), the kelvin (K), the watt (W), the kilometre (km) and the millimetre (mm);
- Non-zero values are expressed to 3 significant figures; when the result of the calculation of the inventory is zero, then the value zero is displayed.
- Modules and indicators that are not declared are marked "N/A".

List of abbreviations used:

Abbreviation	Meaning
LCA	Life Cycle Assessment
RSL	Reference Service Life
FU	Functional Unit
DU	Declared Unit
N/A	Not applicable

Precautions to be taken when using the EPD to compare products

Construction product EPDs may not be comparable if they do not comply with standard NF EN 15804+A2.

NF EN 15804+A2 standard defines in § 5.3 Comparability of EPDs* for construction products, the conditions under which construction products can be compared, on the basis of the information provided by the EPD:

"Consequently, a comparison of the environmental performance of construction products using information from EPDs must be based on the use of the products and their impacts on the building, and must take into account the entire life cycle (all information modules)"

NOTE 1: Outside the context of the environmental assessment of a building, EPDs are not tools to compare construction products and services.

NOTE 2: In assessing the contribution of buildings to sustainable development, a comparison of environmental aspects and impacts should be undertaken in conjunction with the socio-economic aspects and impacts relating to the building.

NOTE 3: For the interpretation of a comparison, reference values are necessary.

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General information

This declaration is an individual range declaration covering the life cycle from cradle to grave (including module D), made at the request of Renson.

This declaration covers the following LINIUS horizontal continuous louvres items in powder coated finish: L.033.01, L.050.00, L.050.25, L.050HF, L.060HF, L.066.01, L.066.06, L.066P, L.075HF, L.120.01, L.033.08, L.033CL, L.050WS.

This declaration covers products of the above-mentioned items placed on the market in mainland France.

Scope of validity: LINIUS products with a weight per unit area of 6.81 kg/m² to 9.78 kg/m². The results of the EPD are based on an average product in the range (average weight of raw materials).

Ventilation profiles may or may not be perforated.

The blades included in the scope of validity are the following items (this includes perforated profile versions):

- Main range: L.033.01, L.050.00, L.050.25, L.050HF, L.060HF, L.066.01, L.066.06, L.066P, L.075HF, L.120.01
- Non-stick and non-transparent: L.033.08
- Closed: L.033CL
- L.050 WS

Aluminium mullion, supporting structure and blade supports are included in the scope of the study.

The additional products are:

- aluminium mounting brackets (mounting brackets, sliding brackets, etc.)
- stainless steel screws.

Not included in the scope of the study: load-bearing wooden structure, finishing strips, sectional door option.

This declaration was published in 03/2025 and is valid until 12/2030 (5-year validity period). This is the first publication.

The declaration is available at the following address: www.inies.fr

Responsible for the declaration and market launch

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Registered office: RENSON NV, MAALBEEKSTRAAT 10, 8790 WAREGEM, BELGIUM
Manufacturing site: Belgium

Making the declaration

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24, rue Joseph Fourier, 38400 Saint-Martin-d'Hères, France

Independent third-party verification

CEN standard EN 15804 is used as the PCR [a]

(As appropriate [b]) Independent verification of declaration and data in accordance with EN ISO 14025: 2010

☐ Internal ☒ External

Independent third-party check: Franck Morin, Nobatek
ISO 14025 registration number: **20241241427**
Date of first publication: 04/02/25
Date checked: 09/2025-01/2025
Period of validity: 02/2025 – 12/2030
Address: Association HQE 4 Avenue Recteur Poincaré 75016 Paris

a) Product Category Rules
b) Optional for business-to-business communication, mandatory for communication between a company and its customers (see standard EN ISO 14025:2010, 9.4).

Description of the functional unit and the product

Description of the functional unit

The functional unit is as follows: "To cover a 1 m² external vertical wall with a ventilated aluminium louvre continuous louvres system over a 50-year lifespan."

The weight per m² of the reference product is 8.28 kg/m². The reference product is the average of the range covered by the EPD: ranging from 6.81 kg/m² to 9.78 kg/m² surface density and distance between blades from 33 mm to 120 mm.

Main performance of the functional unit

/

Description of the product and its packaging

The product is a continuous louvres system consisting of an aluminium support structure to which aluminium blades are fixed by means of aluminium blade supports. Blades come in different thicknesses, lengths and widths.

The product is packaged in cardboard, PE, wooden panels and wooden pallets.

Description of product use (areas of application)

The Linius system can be used to create façades or parts of façades that form a sleek whole with a strong horizontal emphasis.

Other technical features not included in the functional unit

/

Description of the main components and/or materials of the product

The product consists of aluminium blades and powder. The blades are made in the Netherlands.

Reference flow

	Quantity	Units
Main product (mid-range product):		
Aluminium blade and brackets	$7.74^{E}+00$	kg
Powder	$5.40^{E}-01$	kg
Distribution packaging:		
Pine wood	$7.00^{E}-01$	Kg
Oriented strand board	$5.00^{E}-02$	Kg
Cardboard	$8.00^{E}-02$	Kg
PE	$2.00^{E}-02$	kg
Additional installation products:		
Stainless steel screws	$4.00^{E}-01$	kg
Optional aluminium mounting brackets	$6.68^{E}-02$	kg
Total reference flows:	$9.1^{E}+00$	kg

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Specify whether the product contains substances on the REACH candidate list (if more than 0.1% by mass)

The declared product does not contain any substance on the candidate list in excess of 0.1% by mass.

Proof of suitability for use

Certificate EN 1090-1 + A1:2012 – Factory Production Control (FPC)

Distribution channel (B2B or B2C)

B2B or B2C (Business to Business or Business to Consumer)

Description of the reference service life

Parameter	Value
Reference service life	50 years
Declared product properties (on leaving the factory)	/
Theoretical application parameters (if are imposed by the manufacturer), including references to appropriate practices	The product is installed on site in accordance with the specifications described in the documentation supplied by RENSON (installation manual)
Presumed quality of work when installation complies with manufacturer's instructions	No replacement is necessary during the life of the product. The product requires regular maintenance.
Indoor environment (for indoor applications)	Not applicable
Outdoor environment (for outdoor applications)	Refer to the installation guide
Conditions of use	Once installed, the product is constantly exposed to the outdoor environment.
Maintenance scenario	Products are cleaned with water (1L/m²/year)

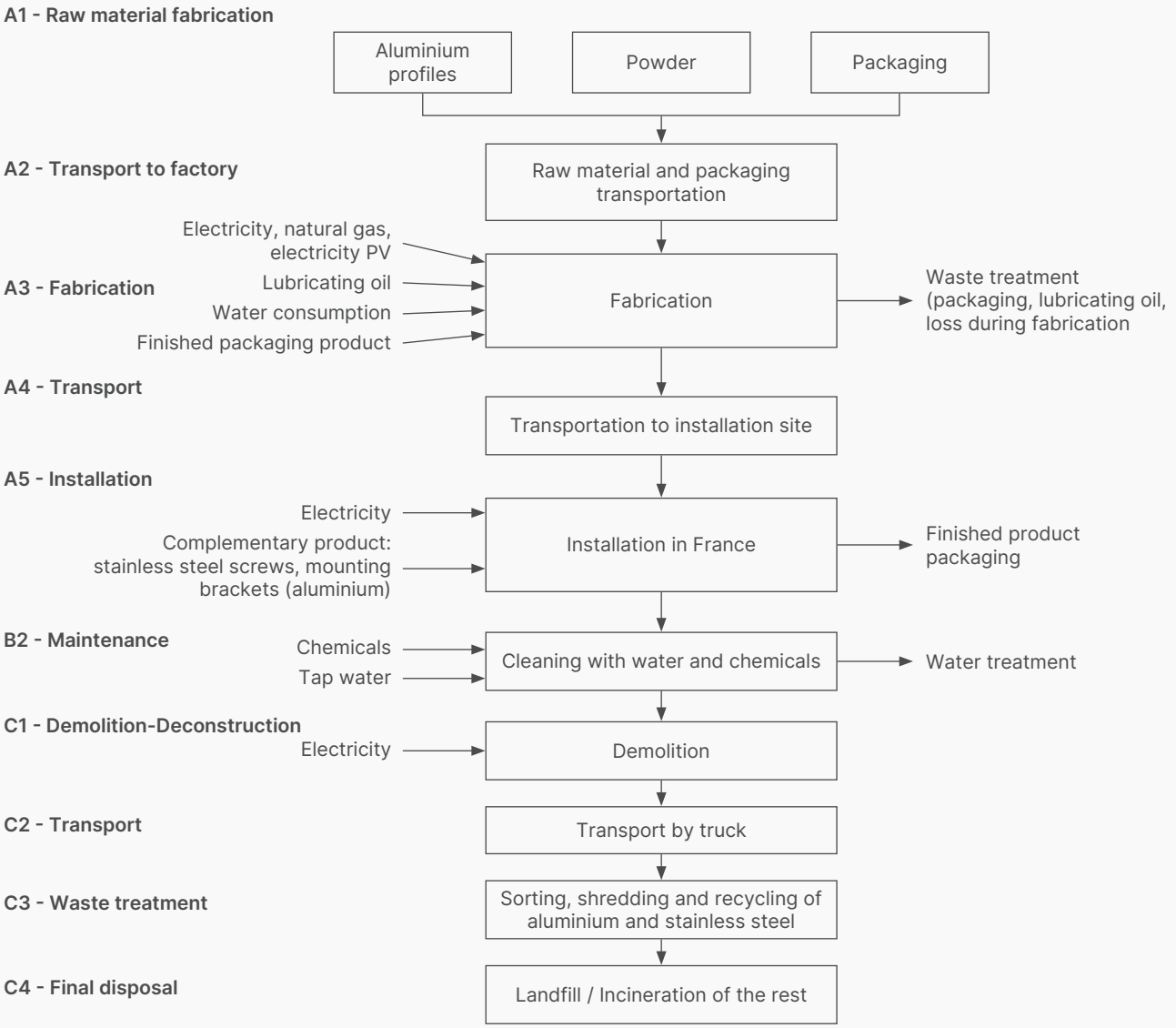
Information on biogenic carbon content

The product does not contain any carbon of biogenic origin. It is delivered using cardboard, PE, pallets and wooden panels.

Biogenic carbon content	**Unit** (expressed per functional unit or per declared unit)
Biogenic carbon content of the product (on leaving the factory)	0 kg C
Biogenic carbon content of the associated packaging (on leaving the factory)	3.68^{E}-01 Kg C

Life cycle stages

Life cycle diagram



The stages taken into account are shown in the table below.

DESCRIPTION OF SYSTEM BOUNDARIES (X = INCLUDED IN LCA ; ND = NOT DECLARED)																
Production stage			Installation stage		Use stage							End-of-life stage				Benefits and costs beyond system boundaries
Extraction of raw materials	Transport	Product manufacture	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Use of energy during the use stage	Use of water during the use stage	Demolition/ Deconstruction	Transport	Waste treatment	Disposal	Potential for reuse, recovery and recycling
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Production stage A1-A3

The aluminium profiles arrive at the factory and are then cut and sawn by hand. After any pre-assembly, the profiles are powder coated in the colour chosen by the customer. The profiles are packed in wooden crates, ready for dispatch.
This stage takes into account:

- The production of aluminium blades (modelled using the supplier's EPD);
- The production of powders (modelled using the supplier's EPD);
- The production of raw material and finished product packaging and its end of life;
- Transport of raw materials and packaging;
- Energy and water consumption;
- Production, transport and end-of-life of consumables (lubricating oil)
- The production of raw material losses, their transport and end of life;

Installation stage A4-A5

Transport to installation site A4

The transport phase covers average transport from the production site to the installation site.

Scenario information	**Units** (expressed per functional unit or per declared unit)
Type of fuel and consumption of the vehicle or type of vehicle used for transport, e.g. long-distance lorry, boat, etc.	Transport, freight, lorry > 32 metric ton, euro6 {RER} | transport, freight, lorry >3232 metric ton, EURO6 | Cut-off, U
Distance	1,000 km per truck
Capacity utilisation (including empty returns)	Approximately 36%
Bulk density of products transported	9.1kg/m²
Volume capacity utilisation coefficient (coefficient: =1 or <1 or ≥1 for compressed or nested products)	Coefficient: <1

Installation in building A5

Installation in the building includes:

- Energy consumption;
- Production of additional products;
- The end-of-life of finished product packaging.

There is no loss of product during installation, as the products are custom-made.

Scenario information	**Units** (expressed per functional unit or per declared unit)
Product falls during installation	0%
Auxiliary inputs for installation	Stainless steel screws: 4.00^{E}-01 kg Aluminium: 6.68^{E}-02kg (mounting bracket)
Use of water	Not concerned

Scenario information	**Units** (expressed per functional unit or per declared unit)
Use of other resources	Not concerned
Quantitative description of the type of energy (regional mix) and consumption during the installation process	1.0^{E}-01 kWh Electricity, medium voltage {FR} | market for electricity, medium voltage | Cut-off, U
Material waste on the construction site prior to the treatment of waste generated by the installation of the product	Product falls: 0.00^{E}+00 kg Auxiliary inputs for the installation: 0.00^{E}+00 kg
Outgoing materials produced by waste treatment on the construction site, e.g. collection for recycling, energy recovery, disposal, etc.	Product falls: 0.00^{E}+00 kg Auxiliary inputs for the installation: 0.00^{E}+00 kg Packaging waste from finished products: - Wooden pallet: 7.00^{E}-01 kg - Wooden panels: 5.00^{E}-02 kg - Cardboard: 8.00^{E}-02 kg - PE: 2.00^{E}-02 kg Wood: 44.5% recycling, 48% energy recovery, 7.5% landfill (GDBAT, 2022) Plastic: 27% recycling, 33.2% energy recovery, 39.8% landfill (Elys Conseil scenario) Paper & cardboard: 91% recycling, 4.1% recovery energy, 4.9% landfill (Elys Conseil scenario)
Direct emissions into the air, soil and water	/

Stage of use B1-B7

Linius products do not require repair, replacement, rehabilitation, energy or water during their working life (B3, B4, B5, B6, B7 nil).

Linius products are cleaned with water once a year (1L/year/m² over the lifetime of the product).

End-of-life stage C1-C4

This stage includes the following end-of-life modules:

- C1: Deconstruction, demolition: electricity consumption for dismantling (unscrewing)
- C2: Transport to waste treatment plant: waste transported over 50 km (NF EN 15804+A2/CN)
- C3: Treatment of waste with a view to reuse, recovery and/or recycling:
  - 96% recycling of aluminium blades and mounting bracket (NF EN 15804+A2/CN)
  - 99% recycling of stainless steel screws (NF EN 15804+A2/CN)
- C4: Disposal.

Scenarios and additional information:

Process	**Units** (expressed per functional unit or per declared unit of components, products or materials specified by type of material)
Collection process specified by type	8.75^{E}+00kg collected individually
	0^{E}+00 kg collected with mixed construction waste
Recovery system specified by type	0^{E}+00 kg for reuse
	7.90^{E}+00kg for recycling
	5.40^{E}-01kg for energy recovery
Disposal specified by type	8.56^{E}-01kg of product or material intended for final disposal
Assumptions for developing scenarios (e.g. transport)	The waste flow is transported by lorry over a distance of 50 km.

Benefits and costs D

Recycling operations in A5 and C3 are included in module D:

- Wood, cardboard and plastic packaging waste in A5:
  - recycling: impact of transport and recycling, avoided production of raw materials
  - energy recovery: avoided production of recovered thermal and electrical energy
- Finished product waste in C3:
  - metal recycling: impact of transport and recycling, avoidance of raw material production

The waste is transported over a distance of 50 km to the sorting centre.

Recovered materials leaving the system boundaries	Recycling processes beyond system boundaries	Materials/energy saved	Associated quantities
Wood	Sorting and shredding	Avoidance of virgin material production	2.48E-01 kg
		Substitution of thermal and electric energy	2.93E-01 kg
Cardboard	Sorting and shredding	Avoidance of virgin material production	7.28E-02 kg
		Substitution of thermal and electric energy	3.28E-03 kg
Plastic: PE	Sorting, finer crushing, selection of aggregate size	Avoidance of raw material production	5.40E-03 kg
		Substitution of thermal and electric energy	6.64E-03 kg
Aluminium	Sorting and shredding	Avoidance of virgin material production	1.71E+00 kg
Steel	Sorting and shredding	Avoidance of virgin material production	1.76E-01 kg

Information for calculating the life cycle assessment

PCR used	NF EN 15804+A2 (2019) and NF 15804+A2/CN (2022)
PSR used	/
System boundaries	The study covers the entire life cycle as defined by NF EN 15804+A2 standard. The following modules are null: - B1 Use: No suitable data identified; - B3 to B5: Not applicable; - B6, B7 Energy and water consumption: none; - No other processes have been omitted.
Allocations	No allocations were required for raw materials made available to factories. Electricity and natural gas are allocated by economic allocation (2022) and then surface allocation. Recycled content (attribution) and/or biomass balance (BMB) allocation approaches such as the 'mass balance credits' method and/or the 'Book and Claim' method in accordance with ISO 22095 cannot be used in the context of ECO EPDs.
Cut-off rule Complies with the requirements of EN 15804+A2	The cut-off rule complies with the requirements of EN 15804+A2 standard. No cut-off rule has been used in this modelling.
Geographical representativeness **Temporal**	The background data comes from the Ecoinvent database v3.9.1 (cut-off by classification), December 2022, subject to an internal critical review in accordance with ISO 14040. The foreground data has been provided by the declarant on the basis of measurements carried out in factories and their own accounts and estimates and corresponds to the context of the year 2022.

Representativeness	Evaluation
Geographical	These EPDs are representative of aluminium continuous louvres systems manufactured in Belgium and used in France.
Technology	These EPDs are representative of continuous louvres systems using lacquered aluminium strips.
Temporal	These EPDs are representative of the year 2022.

Variability (for non-specific EPDs, i.e. collective, range and multi-site EPDs)

The variability of the results for the control environmental impacts is less than ±14%.
Climate Change – Total: - 13%/+13%
Total use of non-renewable primary energy resources (excluding non-renewable primary energy resources used as raw materials): -13%/+14%
Non-hazardous waste disposed of: -13%/+11%
The environmental indicators reported are average indicators.

Impact category	Units	Linius - min	Linius - max	Linius
Climate change	kg CO2 eq	$3.76^{E}+01$	$4.88^{E}+01$	$4.32^{E}+01$
Total non-renewable primary energy	MJ, net LC	$5.63^{E}+02$	$7.39^{E}+02$	$6.49^{E}+02$
Non-hazardous waste disposed of	kg	$2.68^{E}+01$	$3.42^{E}+01$	$3.07^{E}+01$

Software used	SimaPro 9.6
Quality of data	The quality of the main specific data is assessed as follows: • 88% of data with a very good rating • 14% of data with a good rating • 0% of data with an average rating • 0% of data with a poor rating • 0% of data with a very poor rating The quality of the main generic data is assessed as follows: • 0% of data with a very good rating • 92% of data with a good rating • 8% of data with an average rating • 0% of data with a poor rating • 0% of data with a very poor rating The quality of the main generic data is assessed as follows: • 100% of secondary data is plausible • 100% of secondary data is complete • 100% of secondary data is consistent with EN 15804+A2

Results of the life cycle assessment

The tables below summarise the results of the LCA. Totals may not correspond due to rounding.

For energy indicators used as raw materials, a negative value corresponds to a change of use from raw materials to fuels (in the case of incineration, for example).

* **Disclaimer:** the results of these environmental impact indicators should be used with caution because the uncertainties of these results are high or because the experience related to these indicators is limited.

** **Exemption from liability:** this category of impact mainly concerns the possible impact on human health of low-dose ionising radiation from the nuclear fuel cycle. It does not take into account the consequences of possible nuclear accidents, occupational exposure or the disposal of radioactive waste in underground facilities. Potential ionising radiation from soil, radon and certain building materials is not measured by this indicator either.

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Environmental impacts	Production stage	Construction stage		Use stage								End-of-life stage				D Benefits and costs beyond system boundaries
BENCHMARK ENVIRONMENTAL IMPACT INDICATORS	A1/A2/A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Use of energy	B7 Use	C1 Deconstruction /demolition	C2 Transport	C3 Waste treatment	C4 Disposal	
Climate change – total *kg CO_2 equiv/FU*	3.54E+01	9.15E-01	5.24E+00	0.00E+00	3.17E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.79E-03	8.03E-02	1.28E+00	2.86E-01	-1.91E+01
Climate change – fossil fuels *kg CO_2 equiv/FU*	3.61E+01	9.14E-01	3.83E+00	0.00E+00	2.83E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.75E-03	8.02E-02	1.24E+00	2.86E-01	-1.86E+01
Climate change – biogenic *kg CO_2 equiv/FU*	-1.12E+00	3.06E-04	1.40E+00	0.00E+00	3.44E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.44E-05	2.58E-05	3.91E-02	3.00E-05	-1.60E-01
Climate change – land use and land use change *kg CO_2 equiv/FU*	3.89E-01	4.50E-04	1.53E-02	0.00E+00	4.14E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.04E-06	3.99E-05	1.13E-03	7.29E-06	-3.13E-01
Impoverishment of the ozone layer *kg CFC 11 equiv/FU*	1.01E-05	2.07E-08	5.91E-08	0.00E+00	6.07E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.63E-10	1.75E-09	1.51E-08	9.34E-10	-4.63E-07
Acidification *mole of H+ equiv/FU*	1.72E-01	2.26E-03	2.09E-02	0.00E+00	1.68E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.13E-05	1.75E-04	5.17E-03	1.92E-04	-1.06E-01
Aquatic eutrophication, fresh water *kg of P equiv/FU*	1.00E-02	7.66E-06	1.68E-04	0.00E+00	5.67E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.84E-07	6.51E-07	2.64E-05	3.46E-07	-9.00E-04
Marine aquatic eutrophication *kg of N equiv/FU*	2.91E-02	6.04E-04	3.52E-03	0.00E+00	9.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.89E-06	4.32E-05	1.00E-03	8.44E-05	-1.51E-02
Eutrophication on land *kg of N equiv/FU*	2.88E-01	6.33E-03	3.86E-02	0.00E+00	4.31E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.71E-05	4.49E-04	1.10E-02	8.77E-04	-1.61E-01
Photochemical ozone formation *kg of NMCOV equiv/FU*	1.15E-01	3.70E-03	1.38E-02	0.00E+00	1.10E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.31E-05	2.72E-04	3.61E-03	2.43E-04	-6.35E-02

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		Production stage	Construction stage		Use stage								End-of-life stage				D Benefits and costs beyond system boundaries
	Environmental impacts	A1/A2/A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Use of energy	B7 Use	C1 Deconstruction /demolition	C2 Transport	C3 Waste treatment	C4 Disposal	
BENCHMARK ENVIRONMENTAL IMPACT INDICATORS (CONT.)	Depletion of abiotic resources (minerals & metals) *kg Sb equiv/FU**	8.45E-05	2.62E-06	6.76E-05	0.00E+00	1.62E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.14E-07	2.69E-07	2.69E-05	7.48E-08	1.10E-04
	Depletion of abiotic resources (fossil fuels) *MJ/FU*	6.28E+02	1.39E+01	4.85E+01	0.00E+00	4.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E+00	1.14E+00	9.56E+00	2.77E-01	-2.64E+02
	Water need *m³ of equiv deprivation in the world/FU*	2.32E+02	6.72E-02	9.69E-01	0.00E+00	-4.74E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.30E-03	4.76E-03	1.06E-01	6.85E-03	-1.02E+00
ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS	Fine particle emissions *Disease index/FU*	1.65E-06	9.04E-08	2.75E-07	0.00E+00	1.57E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E-10	5.96E-09	8.36E-08	2.10E-09	-1.35E-06
	Ionising radiation (human health) *kBq of U235 equiv/FU***	6.87E+00	6.68E-03	1.66E-01	0.00E+00	2.88E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E-02	5.77E-04	2.61E-02	5.16E-04	-1.32E+00
	Ecotoxicity (freshwater) *CTUe/FU**	3.46E+02	6.67E+00	1.67E+01	0.00E+00	2.34E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.29E-02	5.63E-01	6.64E+00	3.71E+00	-6.23E+01
	Human toxicity, carcinogenic effects *CTUh/FU**	6.10E-08	4.07E-10	1.85E-08	0.00E+00	9.19E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E-11	3.66E-11	8.43E-10	8.56E-11	-5.06E-08
	Human toxicity, non-carcinogenic effects *CTUh/FU**	7.26E-07	9.92E-09	8.31E-08	0.00E+00	4.24E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.54E-10	8.08E-10	3.20E-08	2.79E-09	-3.03E-07
	Impacts related to land use/Soil quality *No dimension/FU**	2.60E+02	1.41E+01	1.90E+01	0.00E+00	1.41E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.97E-02	6.89E-01	1.15E+01	2.96E-01	-3.21E+01

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USE OF RESOURCES

Environmental impacts	Production stage	Construction stage		Use stage							End-of-life stage				
	A1/A2/A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Use of energy	B7 Use	C1 Deconstruction/demolition	C2 Transport	C3 Waste treatment	C4 Disposal	D Benefits and costs beyond system boundaries
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials – *MJ/FU*	1.39E+02	2.03E-01	4.90E+00	0.00E+00	6.31E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E-01	1.79E-02	1.07E+00	2.41E-02	-8.88E+01
Use of renewable primary energy resources as raw materials – *MJ/FU*	1.45E+01	0.00E+00	-6.79E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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/FU*	1.54E+02	2.03E-01	-1.89E+00	0.00E+00	6.31E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E-01	1.79E-02	1.07E+00	2.41E-02	-8.88E+01
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials – *MJ/FU*	6.26E+02	1.39E+01	4.82E+01	0.00E+00	4.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E+00	1.14E+00	9.56E+00	-5.43E+01	-2.64E+02
Use of non-renewable primary energy resources as raw materials – *MJ/FU*	1.83E+00	0.00E+00	-2.32E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.60E-06	0.00E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) -*MJ/FU*	6.28E+02	1.39E+01	4.85E+01	0.00E+00	4.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E+00	1.14E+00	9.56E+00	-5.43E+01	-2.64E+02
Use of secondary materials – *kg/FU*	6.25E+00	0.00E+00	2.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels – *MJ/FU*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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/FU*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water – *m³/FU*	5.44E+00	2.17E-03	4.97E-02	0.00E+00	-1.09E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.42E-04	1.64E-04	5.19E-03	7.44E-04	-5.66E-01

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Environmental impacts		Production stage	Construction stage		Use stage								End-of-life stage				D Benefits and costs beyond system boundaries
		A1/A2/A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Use of energy	B7 Use	C1 Deconstruction /demolition	C2 Transport	C3 Waste treatment	C4 Disposal	
WASTE CATEGORY	Non-hazardous waste disposed of – *kg/FU*	1.24E+00	1.34E-02	2.55E+00	0.00E+00	2.10E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.41E-04	1.10E-03	4.65E-01	1.60E-01	-4.45E+00
	Non-hazardous waste disposed of – *kg/FU*	2.45E+01	1.32E+00	3.35E+00	0.00E+00	2.40E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.34E-02	6.58E-02	1.13E+00	3.25E-01	-3.17E+00
	Radioactive waste disposed of – *kg/FU*	5.38E-03	4.23E-06	1.29E-04	0.00E+00	2.30E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-05	3.74E-07	1.99E-05	3.12E-07	-1.06E-03
OUTGOING FLOWS	Components for re-use – *kg/FU*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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/FU*	9.83E-01	0.00E+00	4.12E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.89E+00	0.00E+00	0.00E+00
	Materials for energy recovery – *kg/FU*	0.00E+00	0.00E+00	3.70E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.40E-01	0.00E+00
	Electricity supplied externally – *MJ/FU*	0.00E+00	0.00E+00	5.53E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.04E+00	0.00E+00
	Steam energy supplied externally – *MJ/FU*	0.00E+00	0.00E+00	1.46E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Gas and process energy supplied externally – *MJ/FU*	0.00E+00	0.00E+00	1.89E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.24E+00	0.00E+00

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ENVIRONMENTAL IMPACTS
Aggregation of the various modules to produce a 'Stage Total' or 'Lifecycle Total'

BENCHMARK ENVIRONMENTAL IMPACT INDICATORS

Impacts/Flows	Production stage	Construction stage	Use stage	End-of-life stage	Life cycle total	Benefits and costs beyond system boundaries stage
Climate change – total *kg CO_2 equiv/FU*	3.54E+01	6.16E+00	3.17E-02	1.66E+00	4.32E+01	-1.91E+01
Climate change –fossil fuels *kg CO_2 equiv/FU*	3.61E+01	4.75E+00	2.83E-02	1.62E+00	4.25E+01	-1.86E+01
Climate change – biogenic *kg CO_2 equiv/FU*	-1.12E+00	1.40E+00	3.44E-03	3.92E-02	3.16E-01	-1.60E-01
Climate change – land use and land use change *kg CO_2 equiv/FU*	3.89E-01	1.58E-02	4.14E-05	1.18E-03	4.06E-01	-3.13E-01
Impoverishment of the ozone layer *kg CFC 11 equiv/FU*	1.01E-05	7.98E-08	6.07E-10	1.81E-08	1.02E-05	-4.63E-07
Acidification *mole of H+ equiv/FU*	1.72E-01	2.31E-02	1.68E-04	5.60E-03	2.00E-01	-1.06E-01
Aquatic eutrophication, fresh water *kg of P equiv/FU*	1.00E-02	1.75E-04	5.67E-05	2.77E-05	1.03E-02	-9.00E-04
Marine aquatic eutrophication *kg of N equiv/FU*	2.91E-02	4.12E-03	9.19E-04	1.14E-03	3.53E-02	-1.51E-02
Eutrophication on land *kg of N equiv/FU*	2.88E-01	4.49E-02	4.31E-04	1.24E-02	3.46E-01	-1.61E-01
Photochemical ozone formation *kg of NMCOV equiv/FU*	1.15E-01	1.75E-02	1.10E-04	4.15E-03	1.37E-01	-6.35E-02

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Aggregation of the various modules to produce a 'Stage Total' or 'Lifecycle Total'

Impacts/Flows	Production stage	Construction stage	Use stage	End-of-life stage	Life cycle total	Benefits and costs beyond system boundaries stage
BENCHMARK ENVIRONMENTAL IMPACT INDICATORS						
Depletion of abiotic resources (minerals & metals) *kg Sb equiv/FU**	8.45E-05	7.02E-05	1.62E-07	2.76E-05	1.82E-04	1.10E-04
Depletion of abiotic resources (fossil fuels) *MJ/FU*	6.28E+02	6.23E+01	4.50E-01	1.22E+01	7.03E+02	-2.64E+02
Water need *m³ of equiv deprivation in the world/FU*	2.32E+02	1.04E+00	-4.74E-01	1.21E-01	2.32E+02	-1.02E+00
ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS						
Fine particle emissions *Disease index/FU*	1.65E-06	3.66E-07	1.57E-09	9.20E-08	2.11E-06	-1.35E-06
Ionising radiation (human health) *kBq of U235 equiv/FU***	6.87E+00	1.73E-01	2.88E-03	3.91E-02	7.08E+00	-1.32E+00
Ecotoxicity (freshwater) *CTUe/FU**	3.46E+02	2.34E+01	2.34E+00	1.10E+01	3.83E+02	-6.23E+01
Human toxicity, carcinogenic effects *CTUh/FU**	6.10E-08	1.89E-08	9.19E-11	9.76E-10	8.09E-08	-5.06E-08
Human toxicity, non-carcinogenic effects *CTUh/FU**	7.26E-07	9.30E-08	4.24E-09	3.60E-08	8.59E-07	-3.03E-07
Impacts related to land use/ Soil quality *No dimension/FU**	2.60E+02	3.31E+01	1.41E-01	1.25E+01	3.06E+02	-3.21E+01

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ENVIRONMENTAL IMPACTS
Aggregation of the various modules to produce a 'Stage Total' or 'Lifecycle Total'

USE OF RESOURCES

Impacts/Flows	Production stage	Construction stage	Use stage	End-of-life stage	Life cycle total	Benefits and costs beyond system boundaries stage
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials – *MJ/FU*	1.39E+02	5.11E+00	6.31E-02	1.21E+00	1.46E+02	-8.88E+01
Use of renewable primary energy resources as raw materials – *MJ/FU*	1.45E+01	-6.79E+00	0.00E+00	0.00E+00	7.69E+00	0.00E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) – *MJ/FU*	1.54E+02	-1.69E+00	6.31E-02	1.21E+00	1.53E+02	-8.88E+01
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials – *MJ/FU*	6.26E+02	6.21E+01	4.50E-01	-4.24E+01	6.47E+02	-2.64E+02
Use of non-renewable primary energy resources as raw materials – *MJ/FU*	1.83E+00	-2.32E-01	0.00E+00	-3.60E-06	1.60E+00	0.00E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) –*MJ/FU*	6.28E+02	6.24E+01	4.50E-01	-4.24E+01	6.49E+02	-2.64E+02
Use of secondary materials – *kg/FU*	6.25E+00	2.20E-01	0.00E+00	0.00E+00	6.47E+00	0.00E+00
Use of renewable secondary fuels – *MJ/FU*	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/FU*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water – m^3/*FU*	5.44E+00	5.19E-02	-1.09E-02	6.44E-03	5.49E+00	-5.66E-01

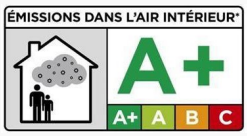
ENVIRONMENTAL IMPACTS
Aggregation of the various modules to produce a 'Stage Total' or 'Lifecycle Total'

Impacts/Flows	Production stage	Construction stage	Use stage	End-of-life stage	Life cycle total	Benefits and costs beyond system boundaries stage
WASTE CATEGORY						
Non-hazardous waste disposed of – *kg/FU*	1.24E+00	2.56E+00	2.10E-03	6.27E-01	4.43E+00	-4.45E+00
Non-hazardous waste disposed of – *kg/FU*	2.45E+01	4.67E+00	2.40E-02	1.53E+00	3.07E+01	-3.17E+00
Radioactive waste disposed of – *kg/FU*	5.38E-03	1.33E-04	2.30E-06	3.61E-05	5.56E-03	-1.06E-03
OUTGOING FLOWS						
Components for re-use – *kg/FU*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling – *kg/FU*	9.83E-01	4.12E-01	0.00E+00	7.89E+00	9.29E+00	0.00E+00
Materials for energy recovery – *kg/FU*	0.00E+00	3.70E-01	0.00E+00	5.40E-01	9.10E-01	0.00E+00
Electricity supplied externally – *MJ/FU*	0.00E+00	5.53E-01	0.00E+00	2.04E+00	2.60E+00	0.00E+00
Steam energy supplied externally – *MJ/FU*	0.00E+00	1.46E-01	0.00E+00	0.00E+00	1.46E-01	0.00E+00
Gas and process energy supplied externally – *MJ/FU*	0.00E+00	1.89E+00	0.00E+00	7.24E+00	9.14E+00	0.00E+00

Additional information on the release of hazardous substances into indoor air, soil and water during use stage

VOCs and formaldehyde (if relevant)

Non concerned.



Resistance to fungal growth (if relevant)

No tests were carried out.

Radioactive emissions (if relevant)

No tests were carried out.

Soil and water (if relevant)

Not applicable, as the product is not connected to the drinking water network. Furthermore, the product is not in contact with run-off water, seepage water, groundwater or surface water.

The product's contribution to quality of life inside buildings

Product characteristics contributing to the creation of hygrothermal comfort conditions in the building

This product does not claim any hygrothermal performance.

Product characteristics contributing to the creation of acoustic comfort conditions in the building

This product does not claim any acoustic performance.

Product characteristics that help to create conditions of visual comfort in the building

This product contributes to the visual aesthetics of the building.

Product characteristics contributing to the creation of olfactory comfort conditions in the building

This product claims no olfactory performance.

References

> ISO 14025: EN ISO 14025:2006-11: Environmental labels and declarations – Type III environmental declarations – Principles and procedures
> ISO 14040: EN ISO 14040:2006-10, Environmental management – Life cycle assessment – Principles and framework ISO 140444: EN ISO 140444:2006 Environmental management — Life cycle assessment — Requirements and guidelines
> NF EN 15804+A2 (2019), Contribution of construction works to sustainable development – Environmental product declarations – Rules for construction product categories
> NF EN 15804+A2/CN (2022), Contributions of construction works to sustainable development – Environmental product declarations – Rules for construction product groups – National supplement to NF EN 15804+A2
> INIES Verification Programme Regulations (2023), INIES, https://www.inies.fr/
> Ecoinvent, www.Eco-invent.org

The original document, published in French, can be provided upon request

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