

Environmental Product Declaration



THE INTERNATIONAL EPD® SYSTEM



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

EPD of aluminium window SINERGY VISION 180 WINDOW SYSTEM

from

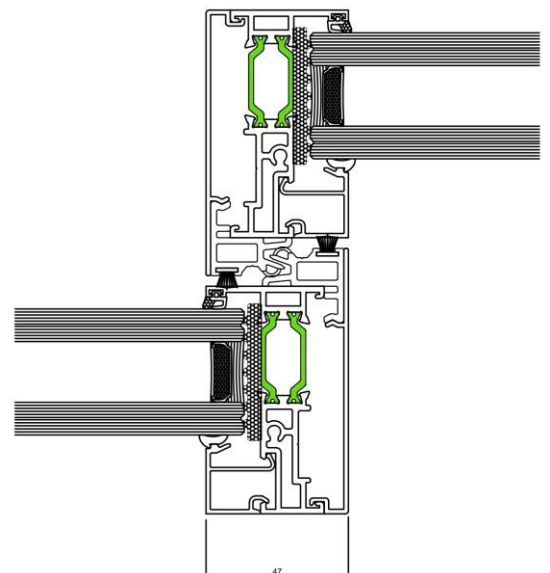
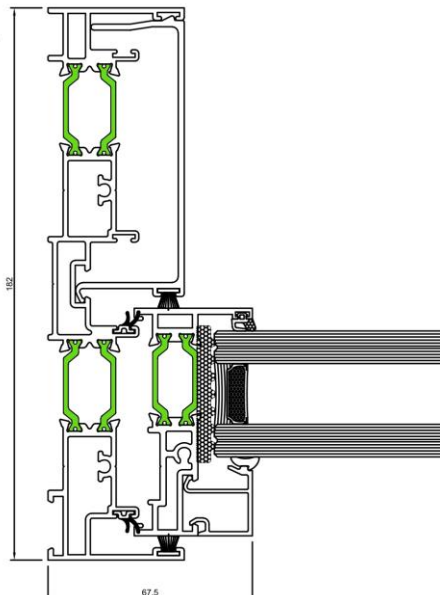
Sinergy SRL



Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-11395
Publication date:	2024-01-08
Valid until:	2029-01-08

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

VISION 180X



General information

Programme information

Programme:	The International EPD [®] System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): construction products, PCR 2019:14, VERSION 1.3.1
PCR review was conducted by: No chair appointed
Life Cycle Assessment (LCA)
LCA accountability: Forethinking Srl Società Benefit; info@forethinking.com ; www.forethinking.com
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: <input checked="" type="checkbox"/> EPD verification by accredited certification body Third-party verification: <i>RINA Services S.p.a. - Via Corsica 12, I - 16128 Genova (Italia)</i> is an approved certification body accountable for the third-party verification Tel: +39.010.53851 – Fax: +39.010.5351000 – www.rina.org Accredited by: Accredia 001H Approved by: The International EPD [®] System
Procedure for follow-up of data during EPD validity involves third party verifier: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); 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 and ISO 14025.

Company information

Owner of the EPD: SINERGY S.R.L.

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0836/935218

Description of the organisation: funded in 1972 in Surano, the company is the result of the vision of its founder Pietro De Francesco. Today the sons Luciano, Tina and Franco continue, with tenacity and determination, to manage a global company, always growing and constantly evolving. At their side a young, competent and enthusiastic staff, in addition to the highly specialized technical staff.

Architecture Division

DFV with the architecture division Sinergy Aluminium Solution, deals with the design and distribution of systems for the construction of aluminium windows. The company constantly invests in new resources, technologies, and automation systems to ensure an advanced product and service for architecture. Sinergy Lab is in fact the name of the network of window and door workshops that aims to transfer to the final consumer market the know-how, quality, organization and values of the parent company DFV, recognized as an authoritative player in the field of painting for aluminium fixtures (Ral, classic and special) is the undisputed leader for the painting of aluminium fixtures decorated with wood effect, with powder-on-powder technology, to which DFV joins those decorated with sublimation.

Logistics Division

- Delivery of finished products and collection of raw materials: based on fixed weekly appointments, the vehicle companies deliver the finished products to their destination and at the same time collect the raw material from the shipping processing. Sinergy guarantees a widespread and efficient distribution network: it counts on many vehicles, all equipped with cantilever, and on the quality of the packaging to give greater protection to the products handled and greater safety during transport.

- Pick-up and order preparation service: a service is provided for customers who use the picking and order preparation shipping accounting to which an entire line is dedicated connected directly to the warehouse automatically.

Name and location of production site(s): the Sinergy production site is based in Puglia, in Surano, a municipality in the province of Lecce, located in the heart of the lower Salento.

Product information

Product name: Sinergy aluminium window system line:

- Sinergy vision 180 window system

Dimension:

2,18 m x 2,18 m

Product description:

The Sinergy window element (vision 180) is an aluminium system consisting of: profiles, polyamide bars, gaskets, brackets, sealing caps, hardware, handles, glass, hardware, nylon dowels, completely disassemblable sealants, for applications in architecture.

The product under study is composed of:

- extruded profiles in aluminum alloy EN AW-6060 (UNI EN 573-3), state of supply T5 and T6 compliant with the UNI EN 515 standard with dimensional tolerances and thicknesses compliant with the UNI EN 12020-2 standard;
- 30 mm bars in polyamide 6,6, reinforced with 25% glass fibre, whose assembly takes place by means of computerized mechanical rolling; furthermore, the mechanical characteristics of the bars must remain unchanged up to a maximum treatment temperature of 245°C;
- fixed frames with a depth of 180 mm;
- central gaskets in expanded EPDM, connected in the joints with the appropriate vulcanized corners;
- 30 mm glazing bead with 90° cut;

- glass bead gaskets to seal the glass;
- die-cast aluminum brackets;
- sealing caps in EPDM and PA6;
- rail (small U) in stainless steel;
- under glass in expanded PE (2L+4H);
- polyester toothbrush (3.5L+4H);
- steel screws;
- glass, double insulating glass composition.

Packaging

The windows are generally transported directly from Sinergy production site to the building site by lorry. Windows are separated from each other by plastic film and corrugated board. These packaging materials are included in the scope of this EPD.

Recycling and disposal

When an aluminium building product reaches the end of its life, it is systematically and selectively collected and sent to recycling facilities for secondary billet production. A collection rate for aluminium products next to 95% is well documented in construction sector and included as default value in EN 17213.

For the other components of the windows, i.e. steel, plastic and glass, end of life scenarios have been setup according to default values specified in EN 17213.

In module D are reported only the net benefits of recycling, i.e. the burden savings at the end of life minus the benefits already considered in the module A1 due to secondary material content.

UN CPC code:

42120 "Doors, windows and their frames and thresholds for doors, of iron, steel or aluminium.

LCA information

Functional unit / declared unit: 1 m²

Time representativeness: the reference year for the LCA calculation is 2023 (gen-aug 2023).

Database(s) and LCA software used: Ecoinvent 3.8 database, SimaPro 9.3.0.3

Description of system boundaries: The system boundaries are cradle to gate with options, modules C1–C4, module D and A5 as optional module (A1–A3 + A5 + C + D and additional modules). Modules B1 to B7 are excluded as they are strongly dependent on the specific application case.

The following stages are included in the study:

Product stage

Module A1: extraction and processing of raw materials, such as aluminium, EPDM, paper and cardboard, polyethylene, recycled nylon, wood, steel, glass, processing of secondary secondary materials (e.g. aluminium recycling processes) and generation of electricity, steam and heat from energy sources primary energy sources, also including their extraction, processing and transport;

Module A2: transport to the gate of the Sinergy S.r.l. production site and internal transport, transport to the window assembler;

Module A3: production of auxiliaries or preliminary products; production of products and co-products; waste disposal; production of packaging for finished products;

Module A5: recycling and disposal of the packaging.

End of life stage

Module C1: demolition/deconstruction;

Module C2: transport from collection to waste processing and disposal site;

Module C3: waste processing;

Module C4: disposal (landfill and incineration) of unrecovered material fractions of waste (not sent for recycling/re-use).

According to PCRs, the following are not considered within the boundaries of the system:

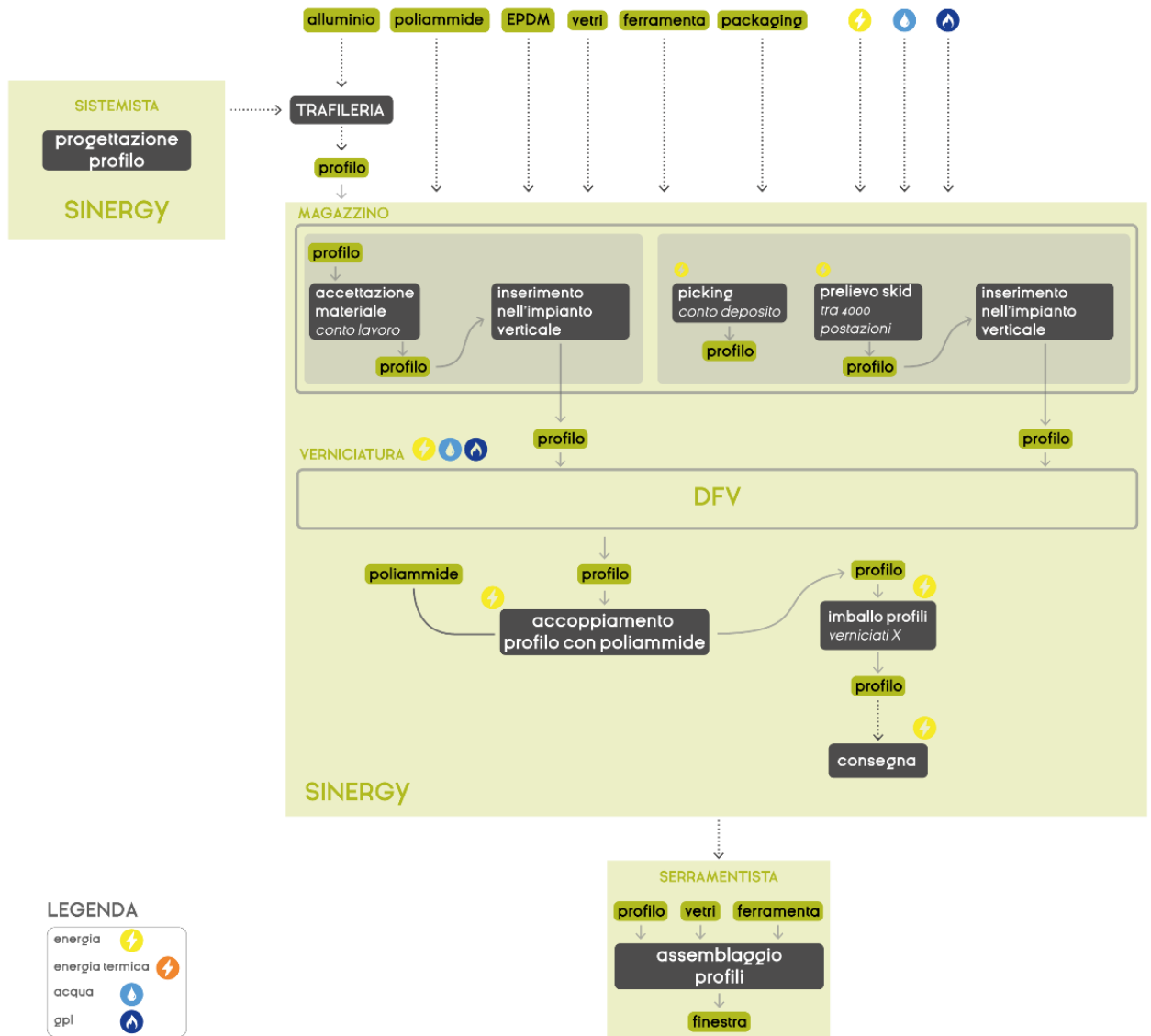
- the production of equipment and buildings with a life span of more than 3 years;
- employee mobility;

- business trips;
- research and development activities.

Module D: load and benefit due to the reusability of the products, the recyclability of the materials (aluminum, steel and glass) and the energy carriers (heat and electricity) that leave the product system.

A4, B1-B7 modules were not included in the study as they were optional according to PCR.

System diagram:



Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage		
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	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	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	X	X	X	X	X		
Geography	GLO	GLO	IT	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	GLO	GLO	GLO	GLO	GLO		
Specific data used	2%					-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation - products (1)	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites (2)	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-

(1) Maximum variation for all declared products - (2) Maximum variation for all manufacturers

X= declared module *ND= not declared module

Data quality:

Specific data used for the manufacturing phase are based on the production year 2023 (gen-aug 2023). All background data used in the study are from LCI database and are not older than 5 years.

Based on the information provided by the company, raw materials were considered to be transport with trucks for some raw materials, with van for others.

The real distances have been taken for the transport of raw materials to the factory (module A2).

With specific reference to the electricity used in the manufacturing processes, the electricity residual mix is used.

Allocation:

In line with EN 15804, no allocation has been made. Energy, resources, incoming packaging, waste and outgoing emissions are assigned to the production of the window under study, which appears to be the only product generated in module A1-A3, without any co-product.

Cut-offs criteria and main assumption:

The main assumptions used in the study are summarized below.

For the production of some raw materials, auxiliary products and packaging an average European production process was considered, while for others a global production process was used.

The modeling of the aluminum profile painting process was done considering the process present inecoinvent: or Powder coat, aluminum sheet {RER}| powder coating, aluminum sheet | Cut-off, U-PAINTING PROFILES, and at the same time including the primary data of:

- raw materials (powder coating): 0,051 kg per kg of painted aluminium;
- energy consumption: 0,139 kWh per kg of painted aluminium;
- GPL: 0,036 kg per kg of painted aluminium supplied by DFV, which is one of Sinergy's major suppliers of aluminum profiles.

In ecoinvent the painting process (powder coating, energy and LPG) refers to 1 m² of 2 mm thick aluminum sheet, while the primary data (powder coating, energy and LPG) refers to 1 kg of aluminum profile . Bearing in mind that the density of aluminum is equal to 2700 kg/m³ and that the painting process according to ecoinvent refers to a 2 mm thick sheet, a conversion process of the primary data was carried out, dividing it by 0,19 m² (0,19 m² = 1 kg/(0,002 m * 2700 kg/m³)), so that the data referred to 1 m² of profile.

Since no information is available on the % of recycled content of incoming aluminum bars, the % of primary and recycled content from the database were taken into consideration in modeling global aluminum (Aluminium alloy, AlMg3 {GLO} | market for | Cut-off , U – 6060, for global aluminium, from Simapro data we can observe that primary aluminum represents 26%, therefore 74% of secondary aluminium, of which the distinction between pre and post consumer is not known).

Furthermore, to model the aluminium, we used the 6060 alloy composition provided by the customer.

The modeling of the recycled polyamide was carried out using:

- Extrusion, plastic pipes {RER}| extrusion, plastic pipes | Cut-off, S;
- Polyethylene terephthalate, granulate, amorphous, recycled {Europe without Switzerland}| market for polyethylene terephthalate, granulate, amorphous, recycled | Cut-off, S, the PET process was used since the recycled nylon one is not present in the database. It is equally valid because it involves the same processes.

The painting of the aluminum profiles modeled according to the above, was inserted into the window product considering as the total surface area the product between the average length and width of the profile, multiplied by two considering that the painting takes place on the two faces of the profile and taking into account a quantity increased by 0,5% due to aluminum scraps during the production process.

Based on the information provided by the company, transport by vehicle was considered for incoming raw materials

- Transport, freight, lorry >32 metric ton, EURO5 {RER}| transport, freight, lorry >32 metric ton, EURO5 | Cut-off, S (balancing);
- Transport, freight, lorry 16-32 metric ton, EURO5 {RER}| transport, freight, lorry 16-32 metric ton, EURO5 | Cut-off, S (pickup truck);
- Transport, freight, light commercial vehicle {Europe without Switzerland}| processing | Cut-off, S (van).

For the transport of raw materials to the factory (module A2), the actual distances were considered.

For energy consumption, two data were considered:

- or relating to the processing phase at Sinergy: consumption 0,083 kWh/kg;
- or relating to the window assembly phase, third-party data was collected, for which consumption is defined as follows: consumption 0,4 kWh/kg.

For module A5, the treatment and disposal process of the finished product packaging was considered. It was considered:

- the recycling of polyethylene "PE (waste treatment) {GLO}| recycling of PE | Cut-off, S"
- the incineration of polyethylene "Waste polyethylene {CH}| treatment of, municipal incineration | Cut-off, S"
- the recycling of "Paper (waste treatment) {GLO}| paper recycling of paper | Cut-off, S"
- the incineration of "Waste paperboard {CH}| treatment of, municipal incineration | Cut-off, S"
- the polyethylene landfill "Waste polyethylene {RoW}| treatment of waste polyethylene, sanitary landfill | Cut-off, S"
- the paper landfill "Waste paperboard {RoW}| treatment of, inert material landfill | Cut-off, S"

For the definition of the end-of-life scenario:

- for phase C1, consumption was not considered as it was carried out manually;
- for phase C2 a distance of 50 km from the waste treatment and disposal plant was assumed, considering a transport "Municipal waste collection service by 21 metric ton lorry {RoW}| processing | Cut-off, S";
- for phase C3 and C4 the percentages of recycling and landfill are in line with those defined in the UNI EN 17213 standard:
 - for phase C3, the aluminum recycling process "Aluminum (waste treatment) {GLO}| recycling of aluminum | Cut-off, S", the steel recycling process "Steel and iron (waste treatment) {GLO}| recycling of steel and iron | Cut-off, S", the glass recycling process "Packaging glass, white (waste treatment) {GLO}| recycling of packaging glass, white | Cut-off, S", the plastic incineration process "Waste plastic, mixture {RoW}| treatment of waste plastic, mixture, municipal incineration | Cut-off, S";
 - for the C4 phase, the aluminum landfill process "Waste aluminum {RoW}| was considered treatment of, sanitary landfill | Cut-off, S", steel dump "Scrap steel {Europe without Switzerland}| treatment of scrap steel, inert material landfill | Cut-off, S", glass landfill "Waste glass {CH}| treatment of, inert material landfill | Cut-off, S", plastic landfill "Waste plastic, mixture {RoW}| treatment of waste plastic, mixture, sanitary landfill | Cut-off, S"

For the benefits and impacts reported in module D, the data provided by the UNI EN 17213 standard were considered, considering the following products as avoided:

- Aluminium, primary, ingot {IAI Area, EU27 & EFTA}| production | Cut-off, S;
- Flat glass, uncoated {RER}| production | Cut-off, S;
- Steel, low-alloyed {RER}| steel production, converter, low-alloyed | Cut-off, S;
- Nylon 6-6 {RER}| production | Cut-off, S

Considering the recycled content in the starting materials, and considering the impacts of the following recycling processes:

- Aluminium, wrought alloy {RER}| treatment of aluminum scrap, new, at remelter | Cut-off, S;
- Packaging glass, green {RER w/o CH+DE}| production | Cut-off, S;
- Steel, low-alloyed {Europe without Switzerland and Austria}| steel production, electric, low-alloyed | Cut-off, S.
- Polyethylene terephthalate, granulate, amorphous, recycled {Europe without Switzerland}| market for polyethylene terephthalate, granulate, amorphous, recycled | Cut-off, S

Content information

The composition is as following:

Sinergy vision 180 window system

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Aluminium	46,21	ND	-
Polymers	5,91	ND	-
Steel	3,37	-	-
Glass	160	-	-
TOTAL	221,40	-	-
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/m ²
Corrugated board box	0,8	<1%	0,204
Plastic film	0,1	<1%	-
TOTAL	0,9		-

The content of substances included in the Candidate List of Substances of Very High Concern (SVHC) in the products does not exceed 0,1 % of their weights.

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit								
Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	1,51E+02	2,85E-02	0,00E+00	2,12E-01	2,81E+00	1,26E-01	-1,93E+01
GWP-biogenic	kg CO ₂ eq.	8,98E-01	4,38E-02	0,00E+00	2,06E-04	2,64E-04	5,99E-04	-4,64E-01
GWP-luluc	kg CO ₂ eq.	3,35E-01	4,53E-07	0,00E+00	7,63E-05	2,39E-05	4,45E-05	-3,33E-01
GWP-total	kg CO ₂ eq.	1,52E+02	7,23E-02	0,00E+00	2,13E-01	2,81E+00	1,27E-01	-2,01E+01
ODP	kg CFC 11 eq.	1,54E-05	1,61E-10	0,00E+00	5,07E-08	6,17E-09	5,18E-08	-1,26E-06
AP	mol H ⁺ eq.	1,04E+00	9,85E-06	0,00E+00	8,86E-04	6,50E-04	1,11E-03	-1,12E-01
EP-freshwater	kg P eq.	4,93E-02	1,27E-07	0,00E+00	1,32E-05	8,37E-06	1,14E-05	-6,94E-03
EP-marine	kg N eq.	1,83E-01	5,69E-06	0,00E+00	2,70E-04	3,65E-04	5,35E-04	-2,24E-02
EP-terrestrial	mol N eq.	1,94E+00	4,76E-05	0,00E+00	2,95E-03	3,12E-03	4,43E-03	-1,99E-01
POCP	kg NMVOC eq.	5,37E-01	1,26E-05	0,00E+00	9,51E-04	7,56E-04	1,27E-03	-6,26E-02
ADP-minerals&metals*	kg Sb eq.	1,61E-03	3,17E-09	0,00E+00	4,87E-07	1,99E-07	2,40E-07	3,10E-04
ADP-fossil*	MJ	1,80E+03	7,62E-03	0,00E+00	3,31E+00	5,26E-01	3,53E+00	-2,50E+02
WDP*	m ³	4,54E+01	3,63E-04	0,00E+00	1,14E-02	1,33E-01	1,82E-02	-5,68E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption							

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit								
Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	1,52E+02	2,85E-02	0,00E+00	2,12E-01	2,81E+00	1,27E-01	-1,96E+01

Resource use indicators

Results per functional or declared unit								
Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
PERE	MJ	2,26E+02	3,6E-04	0,0E+00	4,2E-02	2,0E-02	8,4E-02	-7,4E+01
PERM	MJ	2,86E+00	-	-	-	-	-	-
PERT	MJ	2,3E+02	3,6E-04	0,0E+00	4,2E-02	2,0E-02	8,4E-02	-7,4E+01
PENRE	MJ	1,75E+03	7,6E-03	0,0E+00	3,3E+00	5,3E-01	3,5E+00	-2,5E+02
PENRM	MJ	4,54E+01	-	-	-	-	-	-
PENRT	MJ	1,8E+03	7,6E-03	0,0E+00	3,3E+00	5,3E-01	3,5E+00	-2,5E+02
SM	kg	7,95E+00	-	-	-	-	-	-
RSF	MJ	-	-	-	-	-	-	-
NRSF	MJ	-	-	-	-	-	-	-
FW	m ³	1,42E+00	1,80E-05	0,00E+00	3,65E-04	4,14E-03	4,10E-03	-7,08E-01
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water							

¹ 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.

Waste indicators

Results per functional or declared unit								
Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	4,86E-02	1,96E-08	0,00E+00	8,01E-06	1,70E-06	3,89E-06	5,34E-03
Non-hazardous waste disposed	kg	3,26E+01	1,67E-01	0,00E+00	3,10E-01	2,00E+01	2,42E+01	-3,73E+00
Radioactive waste disposed	kg	5,63E-03	3,45E-08	0,00E+00	2,24E-05	1,19E-06	2,30E-05	-1,12E-03

Output flow indicators

Results per functional or declared unit								
Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
Components for re-use	kg	-	-	-	-	-	-	-
Material for recycling	kg	2,12E+01	-	-	-	0,21	-	-
Materials for energy recovery	kg	-	-	-	-	-	-	-
Exported energy, electricity	MJ	-	-	-	-	-	-	-
Exported energy, thermal	MJ	-	-	-	-	-	-	-

Additional environmental information

This EPD and the PCR 2019:14 "Construction products" are available on the website of The International EPD® System (www.environdec.com).

The verifier and the Programme Operator do not make any claim nor have any responsibility of the legality of the products included in the present EPD. The LCA study and the present EPD have been issued with the technical scientific support of Forethinking Srl Società Benefit, www.forethinking.com

References

- General Programme Instructions of the International EPD® System. Version 4.0
- Forethinking Srl Società Benefit, 2023. Technical report: LCA of windows system produced by Sinergy
- EN 15804:2012+A2:2019 "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"
- International EPD® System PCR 2019:14 Construction products, version 1.3
- International Organisation for Standardization (ISO), 2006a Environmental management - Life Cycle assessment Principles and framework. ISO 14040:2006/Amd 1:2020, Geneva
- International Organisation for Standardization (ISO), 2006b Environmental management - Life Cycle assessment Requirements and guidelines. ISO 14044:2006/Amd 2:2020, Geneva
- International Organisation for Standardization (ISO), 2006c Environmental labels and declarations - Type III environmental declarations - Principles and procedures. ISO 14025:2006, Geneva
- EN 17213:2019 - Windows and doors - Environmental Product Declarations - Product category rules for windows and pedestrian doorsets
- Ecoinvent Database. <http://www.ecoinvent.org/database/>

