

# 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 windows:***

***SINERGY VISION 80 WINDOW SYSTEMS***

from

***Sinergy SRL***



Programme:	The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a>
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0015130
Publication date:	2024-09-17
Valid until:	2029-09-17


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



## General information

### Programme information

<b>Programme:</b>	The International EPD <sup>®</sup> System
<b>Address:</b>	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
<b>Website:</b>	<a href="http://www.environdec.com">www.environdec.com</a>
<b>E-mail:</b>	<a href="mailto:info@environdec.com">info@environdec.com</a>

<b>Accountabilities for PCR, LCA and independent, third-party verification</b>
<b>Product Category Rules (PCR)</b>
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): <i>construction products, PCR 2019:14, VERSION 1.3.4</i>
PCR review was conducted by: <i>Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat <a href="http://www.environdec.com/contact">www.environdec.com/contact</a>.</i>
<b>Life Cycle Assessment (LCA)</b>
LCA accountability: <i>Forethinking Srl Società Benefit; <a href="mailto:info@forethinking.com">info@forethinking.com</a>; <a href="http://www.forethinking.com">www.forethinking.com</a></i>

<b>Third-party verification</b>
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: RINA Services S.p.a. – Via Corsica 12, I – 16128 Genova (Italia) is an approved certification body accountable for the third-party verification
Tel: +39.010.53851 – Fax: +39.010.5351000 – <a href="http://www.rina.org">www.rina.org</a> Accredited by: Accredia 0002VV
Approved by: The International EPD <sup>®</sup> 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.

Contact: Andrea Giachero

andrea.giachero@mysinergy.eu

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, as well as highly specialised technical personnel.

### 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 operator in the field of painting for aluminium fixtures (Ral, classic and special).

### 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 that manages the selection, picking and preparation of orders, by means of an entire line connected directly to the warehouse

Product-related or management system-related certifications: Sinergy pursues its high standard production internal goals for the testing, inspection, and certification of its own quality management system in compliance with UNI EN ISO 9001/UNI EN ISO 14001 and UNI EN ISO 45001.

Name and location of production site(s): the Sinergy production site is based in Puglia, in Surano (Lecce), in the South of Italy.

## Product information

Product name: Sinergy aluminium window system

Product identification: Vision 80 window system

Dimension: 2,18 m x 2,18 m

### Product description:

The product included in this EPD are aluminium windows consisting of a frame and sliding sashes. The frame is assembled from coated aluminium profiles with thermal break. The thermal break is made by means of a reinforced polyamide strip sandwiched between aluminium profiles. Sashes and frames are assembled using components known as fittings. To guarantee the air and water tightness of the window, gaskets made of EPDM and other plastic materials are installed.

### Composition

Vision 80 aluminium windows are composed of:

- Extruded aluminium profiles,
- Polyamide strips,
- Sealing caps in nylon,

- Gaskets in expanded EPDM and PVC
- Brackets in die-cast aluminium and steel
- Nylon glazing gaskets to seal the glasses
- Fitting in steel, aluminium and nylon
- Double insulating glass
- Aluminium handle

### **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 m<sup>2</sup>

Time representativeness: the reference year for the LCA calculation is 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 aluminum, EPDM, paper and cardboard, polyethylene, nylon, wood, steel, glass, processing of secondary materials (e.g., aluminum recycling processes), and generation of electricity, steam, and heat from energy sources primary energy sources, including their extraction, processing, and transportation;

**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).

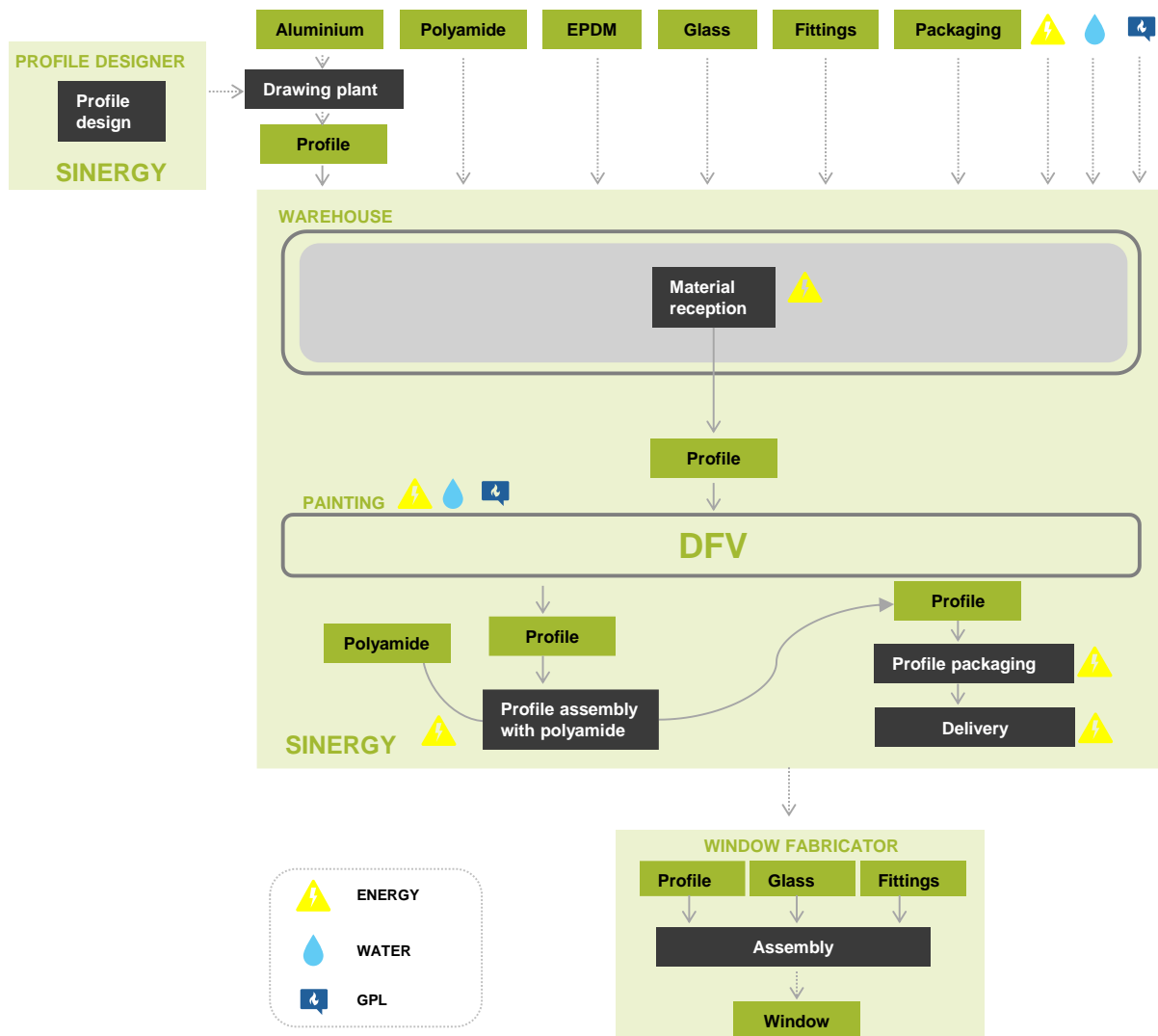
According to PCRs, the following are not considered within the boundaries of the system:

- 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*	X	ND*	ND*	ND*	ND*	ND*	ND*	ND*	X	X	X	X	X
Geography	EU, GLO	EU, GLO	EU, IT	ND*	EU, GLO	ND*	ND*	ND*	ND*	ND*	ND*	ND*	EU, GLO	EU, GLO	EU, GLO	EU, GLO	EU, GLO
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-

(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. 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 assumed to be transported with trucks for some raw materials, with van for others. The real distances were considered 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

The allocation is made in accordance with EN 15804. Energy, resources, incoming packaging, waste and emissions in output are allocated to the production of the window under study according to the total production in the considered year (2023).

### 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 modelling of the aluminium profile painting process was done by using proxy data. The painting process impact on the GWP-GHG was 2.9%.

Based on the information provided by the company, the following transports were 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 energy consumption due to the manufacturing, the total amount of energy consumed in Sinergy production site in 2023 was related to the total production, with the aim to calculate the kWh consumed per kg of product. The energy source is composed of grid energy. Its climate impact is 0,61 kg CO<sub>2</sub> eq./kWh.

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

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;

- for phase C3 and C4: the percentages of recycling and landfill, respectively, are in line with those defined in the UNI EN 17213 standard, as reported in following table.

Parameters, C3, C4 and D	
<b>Recovery rate for metals (recycling)</b>	95%
<b>Recovery rate for glass (recycling)</b>	30%
<b>Recovery rate for plastics (energy valorization)</b>	95%
<b>Metals and plastics to landfill</b>	5%
<b>Glass to landfill</b>	70%
<b>Efficiency for materials recycling</b>	90%

For the benefits and impacts reported in module D, the data provided by the UNI EN 17213 standard were used. Module D reports the environmental burden of recycled scraps generated at the end of life minus that used at the production stage.

Scrap inputs to the production stage are subtracted from scrap to be recycled at the end of life with the aim to obtain the net scrap output from the product system. This principle is applied for aluminium, steel, plastic and glass.

LCA practitioners

This EPD and the supporting LCA study has been performed by:  
Forethinking Srl Società Benefit; info@forethinking.com; [www.forethinking.com](http://www.forethinking.com)



## Content information

### Vision 80 window system (2.18 m\* 2.18 m)

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Aluminium	32,85	-	-
Polymers	11,96	-	-
Steel	2,17	-	-
Glass	115,40	-	-
TOTAL	162,38	-	-
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/m <sup>2</sup>
Corrugated board box	0,8	<1%	0.08
Plastic film	0,1	<1%	-
TOTAL			-

The recycled content according to this PCR excludes pre-consumer scrap. According to ISO 14021:2016, the average recycled content in the product is about 17%. This percentage considers both the recycled content stated in the suppliers' product declarations (where available) and the average recycled content found in the database guidance.

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 (1 m <sup>2</sup> )								
Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
GWP-fossil	kg CO <sub>2</sub> eq.	1,16E+02	5,87E-02	0,00E+00	1,56E-01	8,31E+00	1,00E-01	-2,03E+01
GWP-biogenic	kg CO <sub>2</sub> eq.	9,14E-01	8,76E-02	0,00E+00	1,59E-04	2,66E-01	4,70E-04	-5,58E-03
GWP-luluc	kg CO <sub>2</sub> eq.	2,50E-01	1,52E-06	0,00E+00	5,60E-05	3,40E-03	3,29E-05	-2,44E-01
GWP-total	kg CO <sub>2</sub> eq.	1,17E+02	1,46E-01	0,00E+00	1,56E-01	8,58E+00	1,01E-01	-2,06E+01
ODP	kg CFC 11 eq.	1,31E-05	7,32E-10	0,00E+00	3,72E-08	2,17E-07	3,76E-08	-7,23E-07
AP	mol H <sup>+</sup> eq.	7,91E-01	2,69E-05	0,00E+00	6,51E-04	1,28E-02	8,10E-04	-1,02E-01
EP-freshwater	kg P eq.	3,77E-02	3,60E-07	0,00E+00	9,71E-06	6,74E-04	8,32E-06	-4,74E-03
EP-marine	kg N eq.	1,41E-01	1,36E-05	0,00E+00	1,98E-04	3,47E-03	5,59E-04	-2,67E-02
EP-terrestrial	mol N eq.	1,48E+00	1,19E-04	0,00E+00	2,17E-03	3,21E-02	3,22E-03	-1,82E-01
POCP	kg NMVOC eq.	4,19E-01	3,29E-05	0,00E+00	6,98E-04	9,27E-03	9,27E-04	-5,76E-02
ADP-minerals&metals*	kg Sb eq.	1,21E-03	1,03E-08	0,00E+00	3,57E-07	8,64E-05	1,76E-07	2,72E-04
ADP-fossil*	MJ	1,45E+03	4,20E-02	0,00E+00	2,43E+00	2,60E+01	2,56E+00	-2,76E+02
WDP*	m <sup>3</sup>	3,67E+01	8,19E-04	0,00E+00	8,36E-03	6,40E-01	1,39E-02	-1,29E+01
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 (1 m <sup>2</sup> )								
Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
GWP-GHG <sup>1</sup>	kg CO <sub>2</sub> eq.	1,17E+02	5,87E-02	0,00E+00	1,56E-01	8,52E+00	1,01E-01	-2,04E+01

<sup>1</sup> 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 CO<sub>2</sub> is set to zero.

## Resource use indicators

Results per functional or declared unit (1 m <sup>2</sup> )								
Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
PERE	MJ	1,70E+02	2,86E+00	0,00E+00	3,09E-02	2,14E+00	6,06E-02	-5,32E+01
PERM	MJ	2,86E+00	-2,86E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,73E+02	1,07E-03	0,00E+00	3,09E-02	2,14E+00	6,06E-02	-5,32E+01
PENRE	MJ	1,37E+03	4,20E-02	0,00E+00	2,43E+00	9,46E+01	6,18E+00	-2,76E+02
PENRM	MJ	7,23E+01	0,00E+00	0,00E+00	0,00E+00	-6,87E+01	-3,61E+00	0,00E+00
PENRT	MJ	1,45E+03	4,20E-02	0,00E+00	2,43E+00	2,60E+01	2,56E+00	-2,76E+02
SM	kg	5,81E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m <sup>3</sup>	1,12E+00	3,90E-05	0,00E+00	2,68E-04	2,15E-02	2,97E-03	-7,19E-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							

## Waste indicators

Results per functional or declared unit (1 m <sup>2</sup> )								
Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	3,33E-02	1,04E-07	0,00E+00	5,88E-06	4,34E-02	2,83E-06	4,40E-03
Non-hazardous waste disposed	kg	2,59E+01	3,37E-01	0,00E+00	2,27E-01	1,67E+01	1,75E+01	-2,19E+00
Radioactive waste disposed	kg	4,69E-03	2,50E-07	0,00E+00	1,65E-05	1,10E-04	1,67E-05	-7,03E-04

## Output flow indicators

Results per functional or declared unit (1 m <sup>2</sup> )								
Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,67E+01	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## Additional environmental information

This EPD and the PCR 2019:14 "Construction products" are available on the website of The International EPD<sup>®</sup> System ([www.environdec.com](http://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](http://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 (vision 80) 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 1.3.4
- 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/>
- Conai, Green economy report 2020

