Environmental Product Declaration

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

Wood-plastic composite (WPC) profiles

from

Ino Wood

EPD of multiple products, based on the average results of the product group

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

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): PCR 2019:14 – Construction Products (EN 15804+A2) – version 1.3.3 the UN CPC code 36990 “Articles of plastics”
PCR review was conducted by: PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Life Cycle Assessment (LCA)
LCA accountability: Silvija Serapinaitė, UAB ‘‘Vesta Consulting‘‘
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: Anni Oviir, Rangi Maja OÜ Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ 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: Intervilža, JSC

Address: Elektrėnų str. 14, 21332 Pastrėvys, Lithuania

Contact: Laurynas Savickas
E-mail: info@inowood.eu
WEB: www.inowood.eu

Description of the organisation: InterVilža JSC founded in 1992, has been operating as a manufacturing company since 1935. Production of WPC products begins in 2012. At that time, the company creates the brand InoWood. Today, we are the largest producers of wood-plastic composites in the Baltic States. We specializing in the design, manufacture, and supply of wood-plastic composite (WPC) products. InoWood is recognized as an example of a circular economy, producing WPC products that are both durable and environmentally friendly. They give a second life to recycled secondary raw materials. Our WPC products are popular in residential and public spaces due to their durability and practicality. InoWood is committed to protecting the environment by using 100% recycled raw materials, avoiding hazardous materials, and ensuring their products can be recycled repeatedly.
The company maintains high-quality standards with six modern extrusion lines operating 24/7 and conducts regular product quality checks and laboratory tests in compliance with international standards.
InoWood production is certified - flammability class B-roof and B-floor. In 2013 the German laboratory SKZ conducted tests on InoWood wood-plastic composite terrace boards and confirmed that they meet the requirements of the WPC manufacturers' association QG-Holzwerkstoffe. For that purpose, the commission of this institution conducted an inspection of the production control system and issued a quality certificate giving the right to use the quality label.
We have also carried out technical tests of InoWood products at the KTU laboratory center and the Fire Research Center, the flammability class of WPC boards produced by InoWood was checked. Our products meet the highest quality standards.

Name and location of production site(s): Elektrėnų str. 14, 21332 Pastrėvys, Lithuania

Product information

Product name: Wood-plastic composite (WPC) profiles

Product description: WPC profiles can be used in many industries in the construction industry, furniture production, automotive industry, wherever an alternative to wood or organic plastic is needed. The composite profiles produced by InoWood can be used to install bridges, piers, piers, pool terraces, beds, nests, beehives, and in the production of indoor or outdoor furniture.
InoWood specializes in crafting cutting-edge bio-composite profiles for the construction industry. Their sustainable products include: InoSide, InoDeck, InoFence and others.
Their commitment to sustainability, 25-year warranty against rotting, and certification since 2013 make InoWood a trusted choice for eco-conscious projects.

Product application: InoWood products find application in various contexts, contributing to sustainable construction and architectural designs. Here's where they are commonly used:

1. Facades (InoSide): InoSide provides durable cladding solutions for house facades and shelters. Its impeccable appearance and durability make it an excellent choice for enhancing building exteriors.

2. Terraces (InoDeck): The InoDeck wood-plastic composite terrace system is designed for easy installation in private and public spaces. It's ideal for terraces, bridges, piers, and pool terraces.
3. Fences (InoFence): InoFence offers durable fences, railings, walls, partitions, sectional fences, and sliding gate solutions. Some designs even incorporate metal or glass inserts.
4. Other Products: In addition to the above, InoWood's versatile bio-composite materials can be used for sheds, pergolas, chandeliers, benches, podiums, pots, stairs, and more.

Technical specifications:

Product code	Name and description	Weight per meter length (kg/m)
ADC	InoSide, Façade system	1,56
AP	InoSide, Façade system	0,84
IP	InoSide, Façade system	0,96
PR	InoFence, Fencing system	0,96
PS	InoFence, Fencing system	2,35
FL	InoSide, Façade system	2,20
SE130	InoFence, Fencing system	2,51
SEC100	InoFence, Fencing system	1,49
SP	InoSide, Façade system	0,84
ST	InoFence, Fencing system	3,71
TK	InoDeck, Terrace system	0,89
TL	InoDeck, Terrace system	2,86
TLK	InoDeck, Terrace system	2,10
TLR	InoDeck, Terrace system	3,55
TLR1	InoDeck, Terrace system	3,55
TLR2	InoDeck, Terrace system	3,38
TLR2C	InoDeck, Terrace system	3,55
TLRC	InoDeck, Terrace system	3,55
UPA	InoSide, Façade system	0,84
VP	InoSide, Façade system	0,89

Physical properties of the product:

Characteristics	Standard	Units	Value
Deformation, at 500N load	DIN EN 310	mm	≤1,30
Destructive force	DIN EN 310	N	≥4600
Boiling water absorbtion – length variation	DIN EN 1087	%	≤0,3

UN CPC code: UN CPC code 36990 376 “Articles of plastics”

Geographical scope: The geographical scope of this EPD is Europe, as product is produced in Lithuania and other modules (as transportation or end-of-life treatment) are modelled for the market in Europe.

LCA information

Functional unit / declared unit: The declared unit is 1 kg of product, including its packaging (the weight of the packaging is not included in this 1 kg).

Reference service life: On the assumption of proper use and care, a typical service life is 25 years.

Time representativeness: Primary data was collected internally. The production data refers to the average of the year 2022.

Database(s) and LCA software used: The Ecoinvent database provides the life cycle inventory data for the raw and processed materials obtained from the background system. The used database is Ecoinvent 3.10. The LCA software used is One Click LCA. The EN 15804 reference package used is based on EF 3.1.

Data quality: The foreground data collected internally is based on yearly production amounts and extrapolations of measurements on specific machines and plants. Overall, the data quality can be described as good. The primary data collection has been done thoroughly.

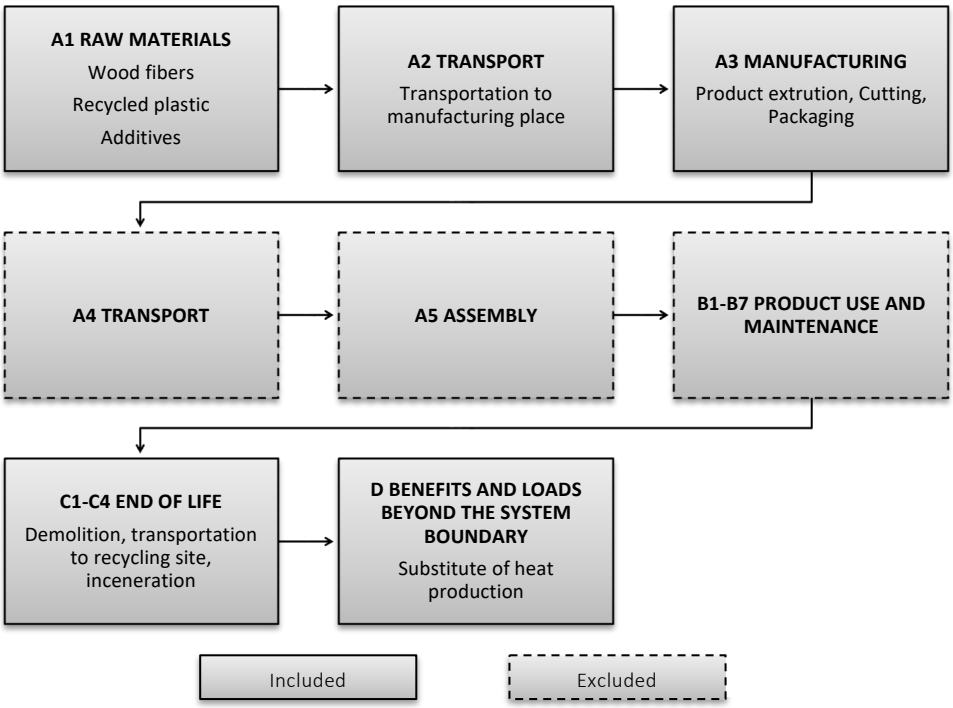
Cut-off criteria: Life cycle inventory data for a minimum of 99% of total material and energy input flows have been included in the life cycle analysis. Although only materials having in summa less than 1% of weight of product were not used in calculations.

Allocation principles:
Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation.

In this study, as per EN 15804, allocation is conducted in the following order;
1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

The allocations in the Ecoinvent 3.10 datasets used in this study follow the Ecoinvent system model ‘Allocation, cut-off, EN15804’.

Description of system boundaries: Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D)
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	MNR	MNR	MNR	MNR	MNR	MNR	MNR	MNR	MNR	x	x	x	x	x
Geography	EU	EU	LT	-	-	-	-	-	-	-	-	-	EU	EU	EU	EU	EU
Specific data used	24,76%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Description of the system boundary (X = Included in LCA; MND = Module Not declared; MNR =Module Not Relevant)

LT – Lithuania, EU = European Union

Product life cycle

Product stage (A1-A3)

A1: This stage considers the extraction and processing of raw materials.

Raw Materials:

InoWood uses WPC granules which are produced from secondary raw materials. These materials include wood fibers (often sourced from sawdust, wood chips, or wood shavings) and recycled plastic (such as polyvinylchloride). By using recycled materials, InoWood contributes to sustainability and reduces waste.

A2: The raw materials are transported to the manufacturing plant. In this case the model includes road transportation of each raw material.

A3: This stage includes the manufacture of products and packaging. It has considered all the energy consumption and waste generated in the production plant.

Manufacturing process

Extrusion Lines:

- InoWood's factory operates six modern extrusion lines continuously, 24 hours a day.
- These extrusion lines are essential for shaping the WPC profiles. During extrusion, the raw materials are heated and forced through a die to form the desired shape.
- Highly qualified technologists oversee the extrusion process to ensure precision and quality.

Quality Control:

- InoWood places a strong emphasis on product quality.
- Laboratory tests are conducted according to international standards to verify the mechanical properties, durability, and safety of their WPC products.
- These tests include assessments of bending strength, impact resistance, water absorption, and fire resistance.

InoWood's commitment to using recycled materials, maintaining high-quality production, and adhering to environmental standards makes them a leader in the WPC industry.

Construction process stage (A4-A5)

This EPD does not cover Construction process stage.

Use stage (B1-B7)

This EPD does not cover Use stage.

Product end of life (C1-C4, D)

C1: Deconstruction, dismantling, demolition

This stage assumes a manual removal of WPC products, so no energy or material consumption has been considered in this stage.

C2: Transport of the discarded product to the processing site

It is estimated that there is no mass loss during the use of the product. Therefore, the end-of-life product is assumed to have the same weight as the declared product. Whole end-of-life products are assumed to be sent to recycling facilities. Transportation distance to the closest facility is estimated as 50 km, and the transportation method is lorry, which is the most common.

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

It is assumed that 100% of product is collected and assumed to be chipped and combusted for heat production with a conversion efficiency higher than 60%.

C4: Discharge (disposal)
It is assumed that 0% of products are sent directly to landfill.

Benefits and loads beyond the system boundary (D):
Module D declares the environmental consequences of the net flows of recovered materials (for reuse, recycling, or energy recovery) or exported energy (recovered energy from, e.g., waste incineration with energy recovery) that have fulfilled the end-of-waste criteria and leave modules A-C. In this case net flow is zero (as product is produced from recycled materials), so benefit in stage D is not accounted.

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-%	Biogenic material, kg C/kg
Plastic (PVC)	0,485	100	0	0
Timber particles	0,485	100	100	0,25
Additives	0,03	0	0	0
TOTAL	1	97		0,25
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**	
Paper	0,00093	0,09	0,0052	
Plastic film	0,00095	0,09	0	
TOTAL	0,00188	0,18		
GWP-GHG intensity of Post-consumer material – 0,541 kg CO_2 eq./kg				

Note: 1 kg biogenic carbon is equivalent to 44/12 kg of biogenic CO_2

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

Results of the environmental performance indicators

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. Note: it is discouraged to use the results of modules A1-A3 without considering the results of module C when module C is declared.

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	1,92E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,39E-03	1,44E+00	0,00E+00	0,00E+00
GWP-fossil	kg CO_2 eq.	1,06E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,39E-03	5,67E-01	0,00E+00	0,00E+00
GWP-biogenic	kg CO_2 eq.	-8,69E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	8,69E-01	0,00E+00	0,00E+00
GWP-luluc	kg CO_2 eq.	1,19E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,16E-06	2,14E-04	0,00E+00	0,00E+00
ODP	kg CFC 11 eq.	2,37E-08	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,94E-11	1,14E-09	0,00E+00	0,00E+00
AP	mol H^+ eq.	6,56E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,84E-05	5,58E-04	0,00E+00	0,00E+00
EP-freshwater	kg P eq.	4,08E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,92E-08	1,79E-06	0,00E+00	0,00E+00
EP-marine	kg N eq.	5,58E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,96E-06	2,19E-04	0,00E+00	0,00E+00
EP-terrestrial	mol N eq.	6,10E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,57E-05	2,31E-03	0,00E+00	0,00E+00
POCP	kg NMVOC eq.	1,30E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,71E-05	6,59E-04	0,00E+00	0,00E+00
ADP-minerals&metals*	kg Sb eq.	3,93E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,50E-08	2,34E-07	0,00E+00	0,00E+00
ADP-fossil*	MJ	2,02E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,82E-02	1,00E+00	0,00E+00	0,00E+00
WDP*	m^3	3,89E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,76E-04	7,48E-02	0,00E+00	0,00E+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**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	1,06E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,39E-03	5,67E-01	0,00E+00	0,00E+00

Resource use indicators

Results per functional or declared unit															
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	-1,46E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,03E-03	-1,91E+01	0,00E+00	0,00E+00
PERM	MJ	6,44E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-6,44E+00	0,00E+00	0,00E+00
PERT	MJ	4,98E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,03E-03	-2,56E+01	0,00E+00	0,00E+00
PENRE	MJ	-1,74E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,82E-02	-5,02E+00	0,00E+00	0,00E+00
PENRM	MJ	2,14E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-2,14E+01	0,00E+00	0,00E+00
PENRT	MJ	1,97E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,82E-02	-2,64E+01	0,00E+00	0,00E+00
SM	kg	5,19E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,33E-05	7,89E-04	0,00E+00	0,00E+00
RSF	MJ	7,71E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,22E-07	1,20E-05	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,23E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,13E-05	1,27E-03	0,00E+00	0,00E+00
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 CO_2 is set to zero.

Waste indicators

Results per functional or declared unit															
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	5,55E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,33E-04	4,32E-02	0,00E+00	0,00E+00
Non-hazardous waste disposed	kg	2,16E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,47E-03	1,35E+00	0,00E+00	0,00E+00
Radioactive waste disposed	kg	6,88E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,69E-08	8,73E-07	0,00E+00	0,00E+00

Output flow indicators

Results per functional or declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	7,04E+00	0,00E+00	0,00E+00

Additional environmental information

Manufacturing energy scenario documentation

Scenario parameter	Value	Source
Residual mix (Lithuania)	0.619 kg CO_2e/kWh	Average Lithuanian residual mix of last three last years (2021, 2022 and 2023) has been modelled according to the Association of Issuing Bodies data (https://www.aib-net.org/facts/european-residual-mix). Data sources: ecoinvent 3.10
Solar energy	0.0833 kg CO_2e/kWh	Electricity production, photovoltaic, 570kWp open ground installation, multi-Si. Data sources: ecoinvent 3.10

References

ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations Principles and procedures.

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.

EN 15804+A2 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

Product Category Rules (PCR): PCR 2019:14 – Construction Products (EN 15804+A2) – version 1.3.3 the UN CPC code 36990 “Articles of plastics”

General Programme Instructions of the international EPD® system. Version 5.0.0.

Data references:
One Click LCA tool

Ecoinvent 3.10 database

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