

# Environmental Product Declaration



In accordance with ISO 14025 and EN 15804:2012+A2:2019 for **Clinker Bricks**  
Manufactured by **Işıklar Tuğla**

Programme  
**The International  
EPD® System**

Programme Operator  
**EPD International AB**

Local Operator  
**EPD Türkiye**

EPD registration number  
**EPD-IES-0017324**

Publication Date  
**2024-12-13**

Valid Until  
**2029-12-13**

# General Information

## Programme Information

<b>Programme</b>	The International EPD® System	<b>Local Operator</b>	EPD Türkiye, managed and run by: SÜRATAM A.S
<b>Address</b>	EPD International AB Box 210 60 SE-100 31 Stockholm, Sweden	<b>Address</b>	Nef 09 B Blok No:7/15 34415 Kağıthane/Istanbul, Türkiye
<b>Website</b>	<a href="http://www.environdec.com">www.environdec.com</a>	<b>Website</b>	<a href="http://www.epdturkey.com">www.epdturkey.com</a>
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## Product Category Rules (PCR)

- CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
- Product Category Rules (PCR): 2019:14 Version 1.3.3, 2023-07-08, Construction Products and CPC 54 Construction Services, EN 15804:2012 + A2:2019 Sustainability of Construction Works with UN CPC code 37310
- PCR review was conducted by: The Technical Committee of the International EPD® System. <https://www.environdec.com/about-us/the-international-epd-system-about-the-system>. The review panel may be contacted via the Secretariat [www.environdec.com/contact](http://www.environdec.com/contact).

## Life Cycle Assessment (LCA)

- LCA practitioner: Can Sönmez MSc. - GreeniX Sustainability Solutions

## 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
- Approved by: The International EPD® System

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

EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they 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 characterization factors); have equivalent content declarations; and be valid at the time of comparison.

Işıklar İnşaat Malzemeleri Sanayi ve Ticaret A.Ş. has the sole ownership, liability, and responsibility for the EPD



# Company Information

Owner of the EPD: Işıklar Tuğla

Contact: Koray Gülsoy, [kgulsoy@isiklartugla.com.tr](mailto:kgulsoy@isiklartugla.com.tr)

In 1973, it started its journey with the vision of quality, durable, reliable and functional building materials, and with half a century of experience and knowledge, it has become one of the leading brands in the brick sector in Turkey.

Işıklar Tuğla, which has always prioritized customer satisfaction and trust and strengthened its leadership in the sector, continues its work with the aim of offering sustainable and aesthetic solutions by expanding the areas of use of bricks in order to carry its deep-rooted past and knowledge to the future.

The product groups of the company, which appeals to every area of the construction and building sector with its wide product range, include Işıklar Pressed Brick, Işıklar Coating Brick, Işıklar Base Brick, Işıklar Cotto, Işıklar İzoklinker® Panel System, and Architon® Facade Systems, which have been heavily preferred in contemporary facades in recent years.

The company, which produces at international standards with high technology in its factories, constantly carries out R&D studies to increase the quality and variety of its products.

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# Company Information

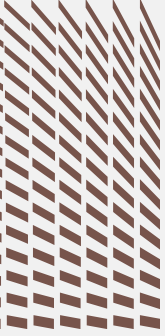
Its products are manufactured in accordance with the quality norms determined by the Turkish Standards Institute and also meet the US and UK standards.

Sustainability is one of the core values of Işıklar Tuğla. Acting with the aim of leaving a livable world for future generations with environmentally friendly production processes and product development studies, the company ensures that its teams are informed about the latest innovations in the sector with continuous training and development programs.

It continues to offer products and services that exceed customer expectations by combining the long-term experiences of its employees with innovative perspectives.

Işıklar Tuğla has an annual production capacity of 118,800 tons and employs more than 250 expert personnel. Its production, sales and field teams work devotedly to provide the best service to its customers with in-depth knowledge of bricks and other products.

Işıklar Tuğla continues to develop innovative products and services, offer the highest quality solutions to customers and contribute to the construction of aesthetic structures inspired by architecture, while maintaining our strong and original position in the sector.



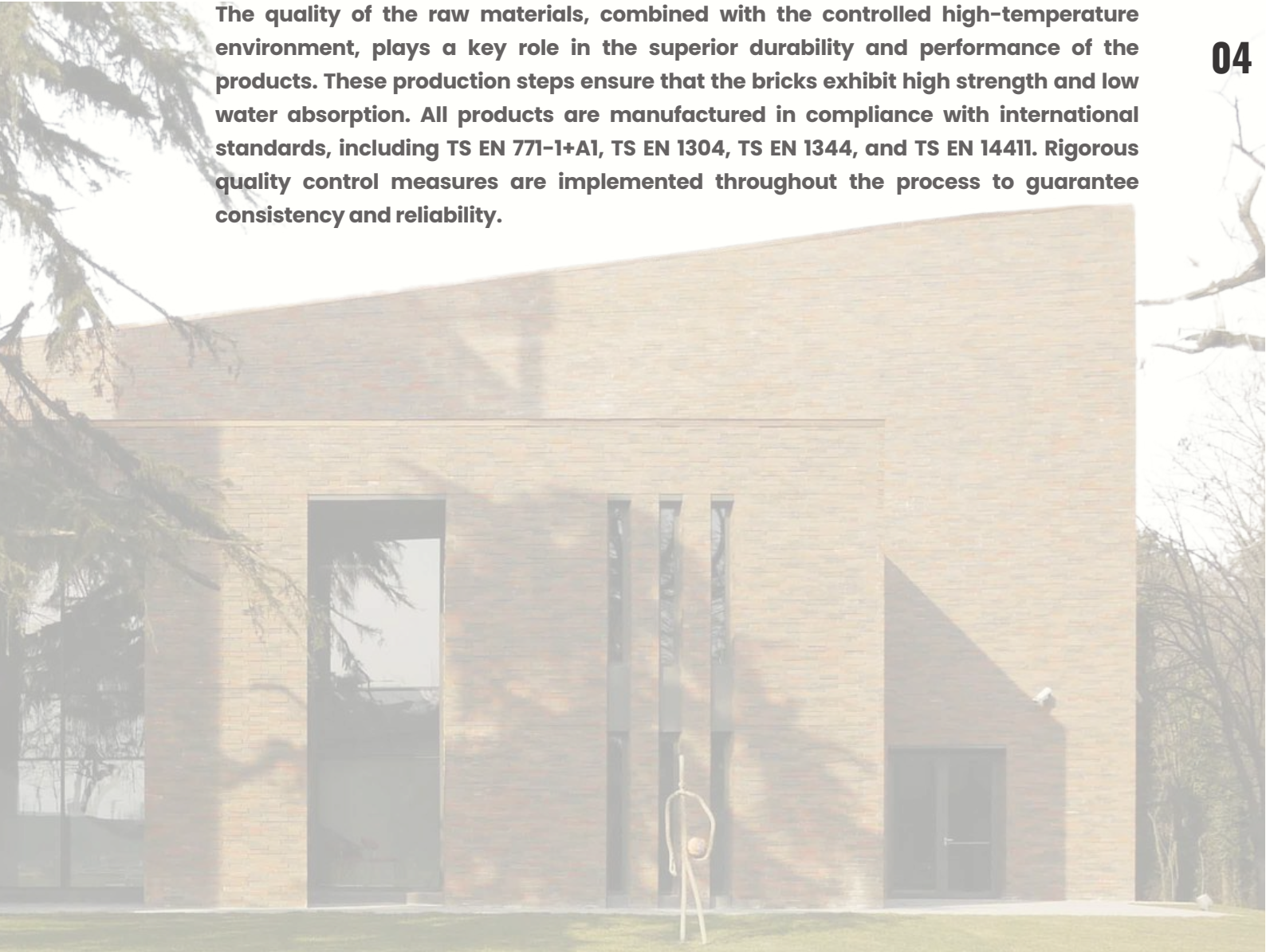


# Product Information

The production process starts with the extraction of high-quality clay from our dedicated mine in Bartın Province, Türkiye. This clay, known for its superior properties, is transported directly to the factory site. Upon arrival, it undergoes an initial crushing and grinding process in the crushing plant to achieve the desired consistency. The prepared clay is then moistened appropriately in the preparation unit and transferred to resting silos for optimal conditioning. This resting phase is essential to ensure uniform quality during the subsequent stages.

Once sufficiently rested, the clay is pressed to form bricks, which are sent to tunnel dryers to remove residual moisture. At the end of the drying process, the bricks are carefully loaded onto Tunnel Kiln cars. These cars transport the bricks through a tunnel kiln, where they are subjected to exceptionally high temperatures using natural gas as the energy source. This precise baking process is crucial for achieving the desired product properties.

The quality of the raw materials, combined with the controlled high-temperature environment, plays a key role in the superior durability and performance of the products. These production steps ensure that the bricks exhibit high strength and low water absorption. All products are manufactured in compliance with international standards, including TS EN 771-1+A1, TS EN 1304, TS EN 1344, and TS EN 14411. Rigorous quality control measures are implemented throughout the process to guarantee consistency and reliability.



# Product Information

## PRODUCT COMPOSITION

		BIOGENIC CONTENT, KG C/DECLARED UNIT
99% >	<b>Clay</b>	0
1% <	<b>BaCO<sub>3</sub></b>	0

## PACKAGING DETAILS

		BIOGENIC CONTENT, KG C/DECLARED UNIT
Shrink	<b>0.811 kg</b>	0
Cardboard	<b>2.552 kg</b>	0
Wooden Pallet	<b>0.744 piece</b>	<b>8.36</b>

per declared unit

# Technical Specifications

Specifications	Parameter	Value
Water Absorption	%	7
Compressive Strength (Average)	Mpa	30
Bending Strength (TS EN 1304) Min.	N	600
Bending Strength (TS EN 1344) Avg.	N/mm	80
Active Soluble Salt Content	Class	S2
Durability	Class	F2
Fire Resistance	Class	A1
Dimension Tolerance	Class	T2
Interval	Class	R2
Gross Dry Unit Volume Mass (Category D1)	kg/m <sup>3</sup>	1640
Net Dry Unit Volume Mass (Category D1)	kg/m <sup>3</sup>	2100

# PROCESS FLOW DIAGRAM

RAW MATERIAL QUARRY



WAREHOUSE



CRUSHER



BOX FEEDER



CRUSHED SOIL STOCKPILE AREA



KOLLERGANG MILL



SHAFT KILN



SILO



ROUND BOX FEEDER



PREHEATING AND TUNNEL KILN



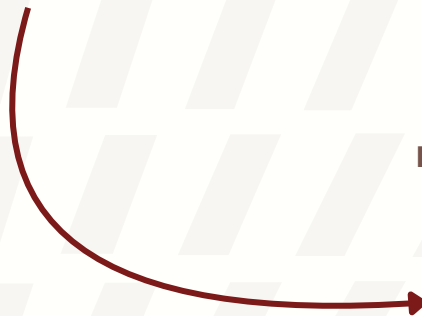
DRYING



EXTRUSION PRESSES



FINISHED GOODS STORAGE AREA





# System Boundary



# A1

## RAW MATERIAL SUPPLY

Raw material supply stage includes raw material extraction and pre-treatment processes before the production. The materials needed for the production of a clinker brick are: clay and barium carbonate.



# A2

## RAW MATERIAL TRANSPORT

Transport is relevant for delivery of raw materials and packaging materials to the plant and transport of materials within the facility. The transport distances and routes are calculated based on the given information from the manufacturer for 2023.



# A3

## MANUFACTURING

This stage considers every step involved in the manufacturing process. This step takes into account the product's packaging as well as energy and water usage.



# A4

## FINAL PRODUCT SHIPMENT

The transportation of the finished product is affected by this step. The manufacturer supplies the transportation routes and tons. When shipping finished goods, sea transportation is the most common mode of transportation.



# A5

## CONSTRUCTION INSTALLATION

The construction & installation module in this project is about the disposal of the packaging of products leaving the factory. It has been taken into account that the shrink and cardboard used will be sent to landfill.





# C1

## DECONSTRUCTION/DEMOLITION

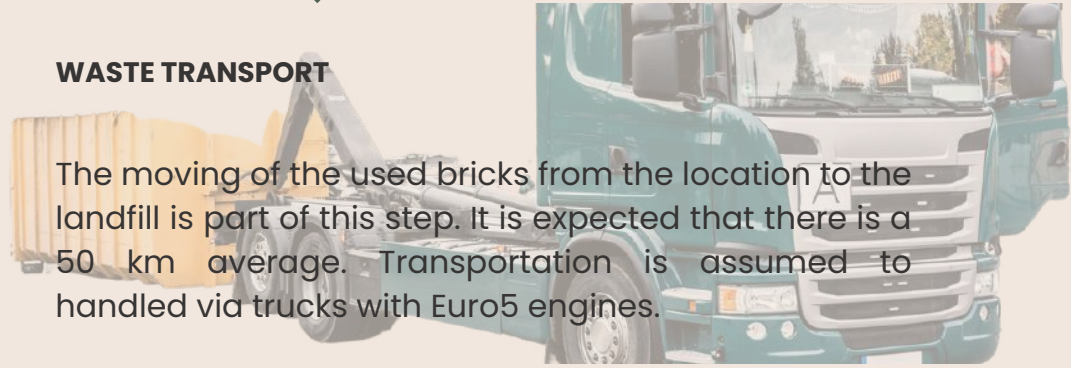
The impacts made during the disassembly process are included at this stage. The impact at this stage for 1 ton of declared product becomes very minimal and can be omitted according to the linked PCR by applying the 1% cut-off criterion, taking into account the product's overall impact throughout multiple life cycle phases



# C2

## WASTE TRANSPORT

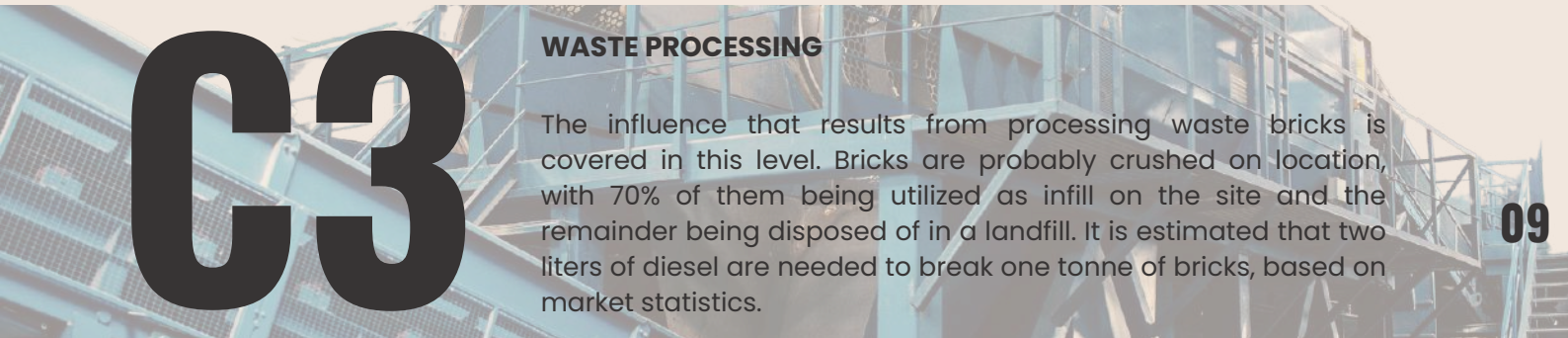
The moving of the used bricks from the location to the landfill is part of this step. It is expected that there is a 50 km average. Transportation is assumed to be handled via trucks with Euro5 engines.



# C3

## WASTE PROCESSING

The influence that results from processing waste bricks is covered in this level. Bricks are probably crushed on location, with 70% of them being utilized as infill on the site and the remainder being disposed of in a landfill. It is estimated that two liters of diesel are needed to break one tonne of bricks, based on market statistics.



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# C4

## DISPOSAL

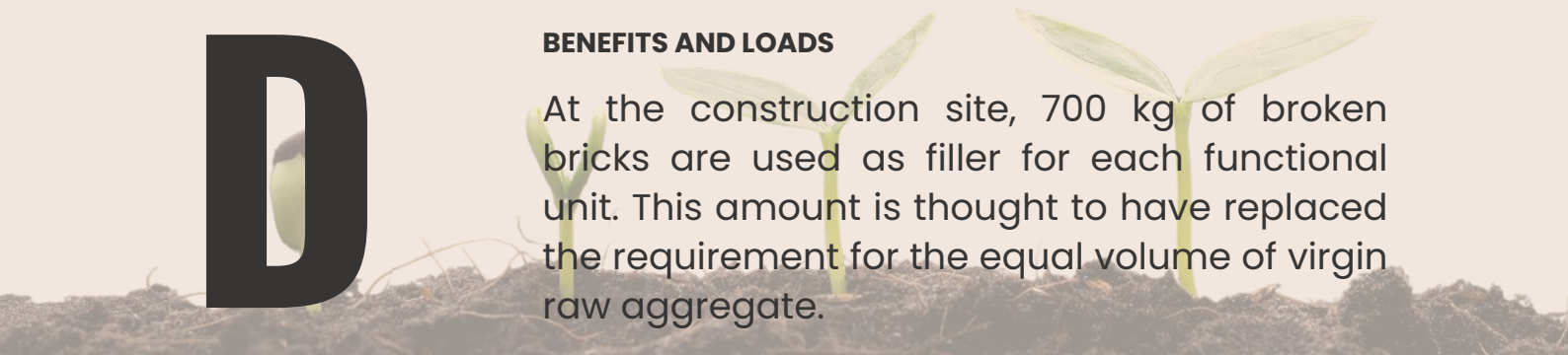
The remaining 30% of the waste bricks are sent to landfill.



# D

## BENEFITS AND LOADS

At the construction site, 700 kg of broken bricks are used as filler for each functional unit. This amount is thought to have replaced the requirement for the equal volume of virgin raw aggregate.



## A4

Transport Mode	Type
Road	Vehicle: Lorry Size Class: >32 Metric Ton Diesel, Euro 5
Sea	Vehicle: Bulk Carrier DWT (Load Capacity): 43,000 Tonnes Heavy Fuel Oil

## A5

Transport Mode	Type
Landfil	Amount: 3,36 kg (Per 1 ton)

## END OF LIFE (C1-C4)

Parameter	Value / Type
Waste Processing (C1)	Demolition (Diesel, burned in building machine)
Average Transport Distance waste (C2)	50 km
Disposal Type (C3-C4)	%70 Recycle (700 kg)
	%30 Landfill (300 kg)
Type of Fuel and Type of Vehicle Used for Transport	Lorry, Size Class: >32 Metric ton, Emission Standard: EURO 5 Fuel Type: Diesel 100% of the Weight Capacity



# LCA Information

## Declared Unit

1 ton of clinker brick manufactured by Işıklar Tuğla

## Conversion Factor

126 kg / m<sup>2</sup>

## System Boundary

Cradle to gate with options, modules C1–C4, module D with optional modules (A1–A3 + A4 + A5 + C + D)

## Cut-Off Rules

1% cut-off applied. Data for elementary flows to and from the product system contributing to a minimum of 99% of the declared environmental impacts have been included.

## LCA Modelling, Calculation and Data Quality

The results of the LCA with the indicators as per EPD requirement are given in the LCA result tables. All energy calculations were obtained using Cumulative Energy Demand (LHV) methodology, while fresh water use is calculated with selected inventory flows in SimaPro according to the PCR. There are no co-product allocations within the LCA study underlying this EPD. The SimaPro 9.6 LCA software and the Ecoinvent 3.9.1 LCA database were used to calculate the environmental impacts. The regional energy datasets were used for all energy calculations. Raw materials, energy and water consumption, waste material and product transport data is primary data collected from the manufacturer.

## Database(s) and LCA Software

Ecoinvent 3.9.1 and SimaPro 9.6

## REACH Regulation

No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH regulations are present in this product either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

## Period Under Review

01.01.2023 – 31.12.2023

## Allocations

Raw materials transportation were weighted according to 2023 transportation figures. In addition, hazardous and non-hazardous waste amounts were also allocated from the 2023 total waste generation.

“Allocation, cut-off by classification” system model was used.

# LCA Information

	Product Stage			Construction Process Stage		Use Stage							End of Life Stage				Benefifits and Loads
	Raw Material Supply	Transport	Manufacturing	Transport	Construction Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction / Demolition	Transport	Waste Processing	Disposal	Future reuse, recycling or energy recovery potentials
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Module Declared	X	X	X	X	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A	X	X	X	X	X
Geography	GLO	GLO	TR	GLO	GLO	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific Data Used	95.7%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - Products	-				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - Sites	0%				-	-	-	-	-	-	-	-	-	-	-	-	-

X: Included in LCA  
 NR: Not relevant  
 ND: Not declared

# LCA Results

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.

EN 15804 reference package is based on EF 3.1

Core Environmental Impact Indicators (Mandatory)	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-Fossil	kg CO2 eq.	2.88E+02	5.87E+01	1.12E-02	0.00E+00	5.36E+00	7.72E+00	1.01E+00	-2.92E+01
GWP-Biogenic	kg CO2 eq.	-6.00E-03	1.05E-02	2.90E-01	0.00E+00	9.73E-04	6.86E-04	6.38E-04	-9.26E-03
GWP-Luluc	kg CO2 eq.	7.92E-01	2.36E-02	1.22E-06	0.00E+00	1.84E-03	6.70E-04	1.09E-04	-5.04E-02
GWP-Total	kg CO2 eq.	2.66E+02	5.88E+01	5.43E-03	0.00E+00	5.37E+00	7.72E+00	1.02E+00	-2.93E+01
ODP	kg CFC11 eq.	8.71E-06	1.11E-06	1.47E-10	0.00E+00	1.08E-07	1.18E-07	1.31E-08	-4.41E-07
AP	mol H+ eq.	8.60E-01	4.54E-01	9.35E-05	0.00E+00	1.73E-02	6.97E-02	8.34E-03	-2.36E-01
EP - Freshwater	kg P eq.	7.85E-02	3.64E-03	1.26E-06	0.00E+00	3.65E-04	2.25E-04	1.12E-04	-3.07E-03
EP - Marine	kg N eq.	2.29E-01	1.20E-01	3.92E-05	0.00E+00	5.88E-03	3.23E-02	3.50E-03	-7.44E-02
EP - Terrestrial	mol N eq.	2.37E+00	1.33E+00	4.27E-04	0.00E+00	6.40E-02	3.54E-01	3.81E-02	-8.16E-01
POCP	kg NMVOC eq.	9.04E-01	4.61E-01	1.35E-04	0.00E+00	2.82E-02	1.05E-01	1.20E-02	-2.57E-01
*ADPE	kg SB eq.	5.45E-04	1.41E-04	4.69E-09	0.00E+00	1.45E-05	2.75E-06	4.19E-07	-1.14E-04
*ADPF	MJ	4.20E+03	8.24E+02	1.39E-01	0.00E+00	7.77E+01	1.01E+02	1.24E+01	-3.98E+02
*WDP	m3 depriv.	6.12E+01	3.63E+00	3.08E-04	0.00E+00	3.70E-01	2.19E-01	2.75E-02	-3.29E+01
Additional environmental impact indicators (Mandatory)	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
**GWP-GHG	kg CO2 eq.	2.90E+02	5.88E+01	1.12E-02	0.00E+00	5.38E+00	7.73E+00	1.00E+00	-2.93E+01
Additional environmental impact indicators (Optional)	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease inc.	9.02E-06	5.03E-06	2.45E-09	0.00E+00	0.00E+00	5.33E-07	1.98E-06	2.18E-07
***IR	kBq U-235 eq.	3.12E+00	9.06E-01	1.15E-04	0.00E+00	0.00E+00	9.44E-02	4.52E-02	1.03E-02
ETP-FW	CTUe	5.05E+03	3.79E+02	4.97E-02	0.00E+00	0.00E+00	3.68E+01	2.86E+01	4.43E+00
*HTP-C	CTUh	2.25E-06	6.97E-07	1.02E-10	0.00E+00	0.00E+00	6.63E-08	6.03E-08	9.08E-09
*HTP-NC	CTUh	1.06E-05	9.54E-07	6.16E-11	0.00E+00	0.00E+00	1.00E-07	2.50E-08	5.49E-09
*SQP	Pt	2.58E+03	6.99E+02	7.39E-01	0.00E+00	0.00E+00	7.82E+01	7.10E+00	6.60E+01
<b>Acronyms</b>	GWP-total: Climate change, GWP-fossil: Climate change- fossil, GWP-biogenic: Climate change - biogenic, GWP-luluc: Climate change - land use and transformation, ODP: Ozone layer depletion, AP: Acidification terrestrial and freshwater, EP-freshwater: Eutrophication freshwater, EP-marine: Eutrophication marine, EP-terrestrial: Eutrophication terrestrial, POCP: Photochemical oxidation, ADPE: Abiotic depletion - elements, ADPF: Abiotic depletion - fossil resources, WDP: Water scarcity, PM: Respiratory inorganics - particulate matter, IR: Ionising radiation, ETP-FW: Ecotoxicity freshwater, HTP-c: Cancer human health effects, HTP-nc: Non-cancer human health effects, SQP: Land use related impacts, soil quality.								
<b>Legend</b>	A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A4: Transport, A5: Installation, C1: Deconstruction/Demolition, C2: Waste transport, C3: Waste Processing, C4: Disposal, D: Benefits and loads								



# LCA Results

Core Environmental Impact Indicators (Mandatory)	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	3.43E+02	1.17E+01	1.29E+01	0.00E+00	1.20E+00	6.03E-01	1.33E-01	0.00E+00
PERM	MJ	1.29E+01	0.00E+00	-1.29E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	3.56E+02	1.17E+01	1.49E-03	0.00E+00	1.20E+00	6.03E-01	1.33E-01	0.00E+00
PENRE	MJ	1.98E+03	8.24E+02	4.26E+01	0.00E+00	7.77E+01	1.01E+02	1.24E+01	0.00E+00
PENRM	MJ	4.25E+01	0.00E+00	-4.25E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	2.03E+03	8.24E+02	1.39E-01	0.00E+00	7.77E+01	1.01E+02	1.24E+01	0.00E+00
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.00E+02
RSF	MJ	0.00E+00	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	0.00E+00
Abbreviations	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 nonrenewable								
	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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable								
	secondary fuels								

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous Waste	kg	1.48E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-Hazardous Waste	kg	2.88E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive Waste	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for reuse	kg	0.00E+00	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	0.00E+00	7.00+02	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	0.00E+00
Exported Energy. Electricity	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported Energy. Thermal	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
*Disclaimer 1	The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.								
*Disclaimer 2	GWP-GHG = Global Warming Potential total excl. biogenic carbon following IPCC AR5 methodology								
	The indicator includes all greenhouse gases included in the GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013								
*Disclaimer 3	This impact category deals mainly with the eventual impact of low dose ionising radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure, or due to radioactive waste disposal in underground facilities. This indicator also does not measure potential ionising radiation from the soil, from radon and from some construction materials is also not measured by this indicator.								
*Disclaimer 4	It is not recommended to use the results of modules A1-A3 without taking into account the results of Module C.								

# References



<b>ISO 14025</b>	EN ISO 14025:2011-10: Environmental labels and declarations – Type III environmental declarations – Principles and procedures
<b>EN 15804</b>	EN 15804:2012+A2:2019 Sustainability of construction works – Environmental Product Declarations – Core rules for the product category of construction products.
<b>PCR 2019-14 v.1.3.3</b>	EPD International. (2022). PCR 2019:14, Construction Products, version 1.3.3 <a href="http://www.environdec.com">www.environdec.com</a> .
<b>ISO 14040</b>	ISO 14040:2006, Environmental management – Life cycle assessment – Principles and framework.
<b>ISO 14044</b>	ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines (pp. 1–54).
<b>SimaPro</b>	SimaPro software for LCA calculations, developed by PRé Sustainability, Stationsplein 121, 3818 LE Amersfoort, Netherlands, <a href="https://simapro.com">https://simapro.com</a>
<b>Ecoinvent</b>	Ecoinvent dataset, developed by the Swiss Centre for Life Cycle inventories, Technoparkstrasse 1,8005 Zurich, Switzerland <a href="https://ecoinvent.org/">https://ecoinvent.org/</a>
<b>IPCC</b>	IPCC. (2021a). Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.
<b>GPI</b>	EPD International. (2021). General Programme Instructions for the International EPD® System. Version 4.0.

# Contact

## Programme

The International EPD® System  
[www.environdec.com](http://www.environdec.com)

## Programme Operator

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