

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

PE 100 pipe

Pestán d.o.o



EPD HUB, HUB-1966

Published on 27.08.2024, last updated on 27.08.2024, valid until 27.08.2029.

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Pestan d.o.o
Address	1300 Kaplara br. 189,34301 Arandjelovac
Contact details	office@pestan.net
Website	https://pestan.net/en/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 und ISO 14025
PCR	EPD Hub Core PCR Version 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	LCA Institut
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification
EPD verifier	Edis Glogic, as an authorized verifier acting for EPD Hub Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	PE 100 pipe
Additional labels	HDPE pipes / HDPE pipes with PP cover
Product reference	dn400/12m pn6 PE 100
Place of production	Serbia
Period for data	2023
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	-

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	2.11
GWP-total, A1-A3 (kgCO ₂ e)	2.07
Secondary material, inputs (%)	7.84
Secondary material, outputs (%)	75
Total energy use, A1-A3 (kWh)	8.56
Net freshwater use, A1-A3 (m ³)	29.8

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Private company Peštan is a leader in the Balkans in the production and distribution of products and solutions from the polymers.

The company was founded in 1989 and has been producing water pipes made of polyethylene. Over time, we introduced new materials (polypropylene and PVC) and an expanded product assortment. Today, in our offer you may find more than 8500 products, divided into two categories: piping and bathroom solutions.

Peštan operates in more than 80 countries worldwide through a global network of agents and distributors. Primarily export-oriented, the company is present in the market of Europe, the Middle East, North Africa, Latin America, and the United States.

PRODUCT DESCRIPTION

Pestan HDPE pipes for water conduction under pressure and gas are high quality pipes made of supreme quality polyethylene PE-100. Pipes made of polyethylene are physiologically and toxicologically completely safe for use in water supply. Complete program Pestan HDPE pipes is produced under the norm EN 12201. Advantage of this type of pipes comparing to the other types of pipe materials is its high flexibility and resistance to seismic impacts and ground movement and can be used in areas with such characteristics. Flexibility radius of polyethylene pipes is 20d. High resistance of polyethylene to scale makes these types of pipes more adequate for usage in water conduction than other pipe materials. Polyethylene water pipes are resistant to UV rays and temperatures between -30°C and +60°C. Further information can be found at <https://pestan.net/en/>.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	-	-
Minerals	-	-
Fossil materials	100	World
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0.01

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg
Mass per declared unit	1 kg

SUBSTANCES, REACH - VERY HIGH CONCERN

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

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

Raw materials considered are covering virgin and recycled PE used for the pipe production process, as well as the paint and any losses made during the

production process. The production method is a extrusion of the pipes and energy for that process is accounted, including solar energy produced by roof-installed panels. The different stages are material conveying, extrusion, cooling, cutting and final packaging of the product that includes label and wood pallets.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. Transportation is calculated based on averaged scenario and impacts are included in the results. Mass of packed product is used for the calculation in module A4. Installation (A5) is including also the waste treatment for end of life modelling of packaging average european scenario has been used. Transportation distance of waste to the waste treatment facility is included as well.

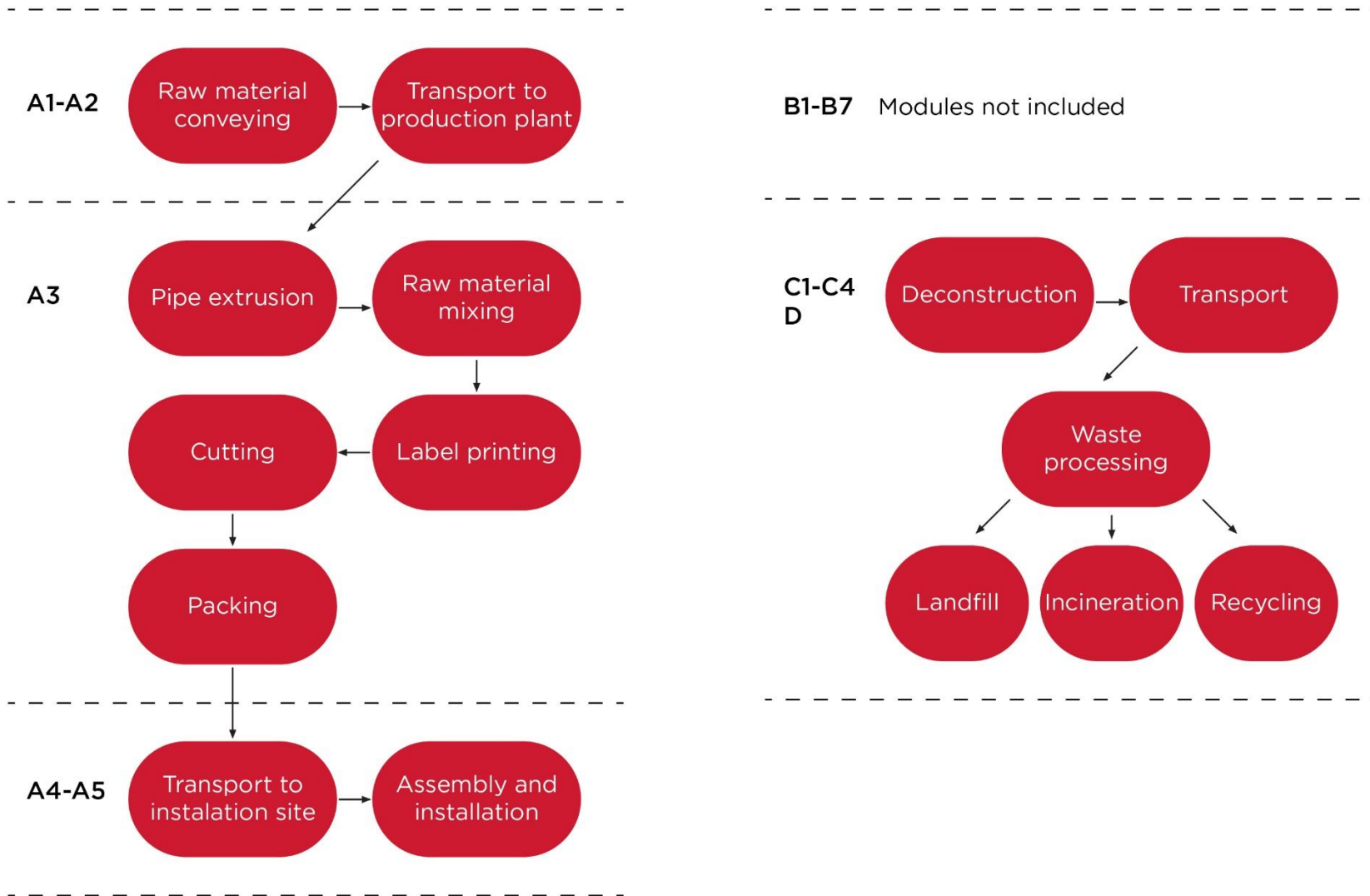
PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.

PRODUCT END OF LIFE (C1-C4, D)

It is assumed that the waste product is collected separately and transported to a waste treatment facility. Transportation distance to waste treatment plant is assumed to be 50 km and the transportation method is assumed to be lorry (C2). Module C3 accounts for energy and resource inputs for sorting and treating of materials for recycling. Landfilled materials are included in module C4. Due to the material recovery potential of the product, and material and energy recovery potential of its packaging, recycled raw materials lead to avoided virgin material production and the energy recovered from incineration replaces electricity and heat from primary sources. Benefits and loads from incineration and recycling are included in Module D.

LIFE CYCLE DIAGRAM



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	Allocated by mass or volume
Packaging material	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	-

This EPD is product and factory specific and does not contain average calculations.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases as sources of environmental data.



ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total ¹⁾	kg CO ₂ e	1,69E+00	8,89E-02	2,91E-01	2,07E+00	8,90E-02	3,63E-02	MND	MND	MND	MND	MND	MND	MND	MNR	4,50E-03	1,33E+00	3,71E-02	-1,65E+00
GWP – fossil	kg CO ₂ e	1,69E+00	8,88E-02	3,27E-01	2,11E+00	8,90E-02	4,01E-04	MND	MND	MND	MND	MND	MND	MND	MNR	4,50E-03	1,33E+00	3,71E-02	-1,67E+00
GWP – biogenic	kg CO ₂ e	-1,21E-03	3,40E-05	-3,58E-02	-3,70E-02	0,00E+00	3,59E-02	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	2,55E-02
GWP – LULUC	kg CO ₂ e	2,50E-03	3,28E-05	7,49E-05	2,61E-03	3,63E-05	3,34E-07	MND	MND	MND	MND	MND	MND	MND	MNR	1,75E-06	3,78E-05	2,80E-06	-1,67E-03
Ozone depletion pot.	kg CFC ₋₁₁ e	1,33E-09	2,04E-08	3,88E-09	2,56E-08	1,96E-08	6,87E-11	MND	MND	MND	MND	MND	MND	MND	MNR	1,06E-09	2,15E-09	8,02E-10	-6,53E-08
Acidification potential	mol H ⁺ e	4,86E-03	3,76E-04	3,93E-03	9,17E-03	3,68E-04	2,89E-06	MND	MND	MND	MND	MND	MND	MND	MNR	1,46E-05	2,57E-04	2,28E-05	-1,04E-02
EP-freshwater ²⁾	kg Pe	5,30E-05	7,27E-07	1,04E-04	1,57E-04	7,51E-07	1,11E-08	MND	MND	MND	MND	MND	MND	MND	MNR	3,81E-08	8,59E-07	4,40E-08	-5,08E-05
EP-marine	kg Ne	1,12E-03	1,12E-04	8,52E-04	2,08E-03	1,07E-04	1,33E-06	MND	MND	MND	MND	MND	MND	MND	MNR	3,22E-06	1,05E-04	1,41E-05	-1,33E-03
EP-terrestrial	mol Ne	1,20E-02	1,23E-03	2,91E-03	1,61E-02	1,19E-03	1,13E-05	MND	MND	MND	MND	MND	MND	MND	MNR	3,57E-05	1,12E-03	8,44E-05	-1,56E-02
POCP (“smog”) ³⁾	kg NMVOCe	5,75E-03	3,94E-04	8,76E-04	7,02E-03	3,61E-04	3,29E-06	MND	MND	MND	MND	MND	MND	MND	MNR	1,38E-05	2,88E-04	3,24E-05	-5,26E-03
ADP-minerals & metals ⁴⁾	kg Sbe	8,43E-08	2,08E-07	9,26E-07	1,22E-06	3,10E-07	1,13E-09	MND	MND	MND	MND	MND	MND	MND	MNR	1,10E-08	3,66E-07	9,10E-09	-4,79E-06
ADP-fossil resources	MJ	1,28E-01	1,33E+00	3,61E+00	5,07E+00	1,29E+00	6,46E-03	MND	MND	MND	MND	MND	MND	MND	MNR	7,04E-02	2,83E-01	6,16E-02	-3,54E+01
Water use ⁵⁾	m ³ e depr.	7,85E-03	5,97E-03	2,58E-01	2,72E-01	5,64E-03	5,79E-04	MND	MND	MND	MND	MND	MND	MND	MNR	3,14E-04	4,39E-02	3,70E-04	-4,35E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO₄e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy ⁸⁾	MJ	7,43E-01	1,50E-02	9,01E-01	1,66E+00	1,51E-02	3,20E-04	MND	MND	MND	MND	MND	MND	MND	MNR	7,93E-04	2,22E-02	1,15E-03	-2,93E+00
Renew. PER as material	MJ	9,95E-03	0,00E+00	3,14E-01	3,24E-01	0,00E+00	-3,14E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	-7,35E-03	-2,45E-03	4,61E-01
Total use of renew. PER	MJ	7,53E-01	1,50E-02	1,22E+00	1,98E+00	1,51E-02	-3,14E-01	MND	MND	MND	MND	MND	MND	MND	MNR	7,93E-04	1,49E-02	-1,30E-03	-2,47E+00
Non-re. PER as energy	MJ	2,42E+01	1,33E+00	3,58E+00	2,92E+01	1,29E+00	6,46E-03	MND	MND	MND	MND	MND	MND	MND	MNR	7,05E-02	2,83E-01	6,16E-02	-2,14E+01
Non-re. PER as material	MJ	4,48E+01	0,00E+00	-6,82E-01	4,41E+01	0,00E+00	-2,08E-02	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	-3,30E+01	-1,10E+01	1,54E+01
Total use of non-re. PER	MJ	6,90E+01	1,33E+00	2,90E+00	7,32E+01	1,29E+00	-1,43E-02	MND	MND	MND	MND	MND	MND	MND	MNR	7,05E-02	-3,28E+01	-1,10E+01	-5,95E+00
Secondary materials	kg	7,84E-02	3,70E-04	2,02E-03	8,08E-02	4,24E-04	4,28E-06	MND	MND	MND	MND	MND	MND	MND	MNR	1,95E-05	1,28E-03	2,20E-05	3,49E-01
Renew. secondary fuels	MJ	1,85E-06	3,74E-06	1,06E-02	1,06E-02	5,49E-06	4,36E-08	MND	MND	MND	MND	MND	MND	MND	MNR	1,97E-07	9,78E-06	8,45E-07	-7,88E-06
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m ³	2,98E+01	1,73E-04	-2,39E-02	2,98E+01	1,52E-04	2,21E-06	MND	MND	MND	MND	MND	MND	MND	MNR	9,09E-06	2,93E-04	6,59E-05	-1,74E-02

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	2,51E-03	1,77E-03	4,79E-03	9,07E-03	1,85E-03	7,82E-06	MND	MND	MND	MND	MND	MND	MND	MNR	9,28E-05	3,56E-03	0,00E+00	-1,02E-01
Non-hazardous waste	kg	3,79E-02	2,91E-02	3,56E+00	3,63E+00	2,96E-02	1,76E-02	MND	MND	MND	MND	MND	MND	MND	MNR	1,52E-03	4,71E-01	2,50E-01	-3,65E+00
Radioactive waste	kg	3,86E-07	8,92E-06	4,76E-06	1,41E-05	8,51E-06	2,15E-08	MND	MND	MND	MND	MND	MND	MND	MNR	4,75E-07	7,48E-07	0,00E+00	-7,98E-05

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	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	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,80E-03	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	3,30E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	4,20E-01	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,10E-02	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	6,77E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO ₂ e	1,66E+00	8,79E-02	3,25E-01	2,07E+00	8,81E-02	1,01E-03	MND	MND	MND	MND	MND	MND	MND	MNR	4,45E-03	1,32E+00	3,01E-02	-1,61E+00
Ozone depletion Pot.	kg CFC ₁₁ e	1,20E-09	1,62E-08	3,39E-09	2,08E-08	1,55E-08	5,53E-11	MND	MND	MND	MND	MND	MND	MND	MNR	8,38E-10	1,87E-09	6,37E-10	-5,36E-08
Acidification	kg SO ₂ e	3,97E-03	2,92E-04	3,47E-03	7,73E-03	2,87E-04	2,17E-06	MND	MND	MND	MND	MND	MND	MND	MNR	1,19E-05	1,87E-04	1,73E-05	-8,83E-03
Eutrophication	kg PO ₄ ³ e	1,15E-03	6,65E-05	2,78E-03	3,99E-03	6,58E-05	2,87E-05	MND	MND	MND	MND	MND	MND	MND	MNR	2,60E-06	2,87E-04	1,40E-03	-1,86E-03
POCP (“smog”)	kg C ₂ H ₄ e	5,92E-04	1,14E-05	1,34E-04	7,37E-04	1,17E-05	2,15E-07	MND	MND	MND	MND	MND	MND	MND	MNR	5,47E-07	7,47E-06	5,46E-06	-4,91E-04
ADP-elements	kg Sbe	9,71E-08	2,02E-07	9,08E-07	1,21E-06	3,02E-07	1,07E-09	MND	MND	MND	MND	MND	MND	MND	MNR	1,06E-08	3,57E-07	8,79E-09	-4,77E-06
ADP-fossil	MJ	7,09E+01	1,33E+00	3,61E+00	7,59E+01	1,29E+00	6,46E-03	MND	MND	MND	MND	MND	MND	MND	MNR	7,04E-02	2,82E-01	6,16E-02	-3,51E+01

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ⁹⁾	kg CO ₂ e	1,69E+00	8,88E-02	3,27E-01	2,11E+00	8,90E-02	4,01E-04	MND	MND	MND	MND	MND	MND	MND	MNR	4,50E-03	1,33E+00	3,71E-02	-1,67E+00

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH₄ fossil, CH₄ biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO₂ is set to zero.

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online

This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Edis Glogic, as an authorized verifier acting for EPD Hub Limited
27.08.2024

