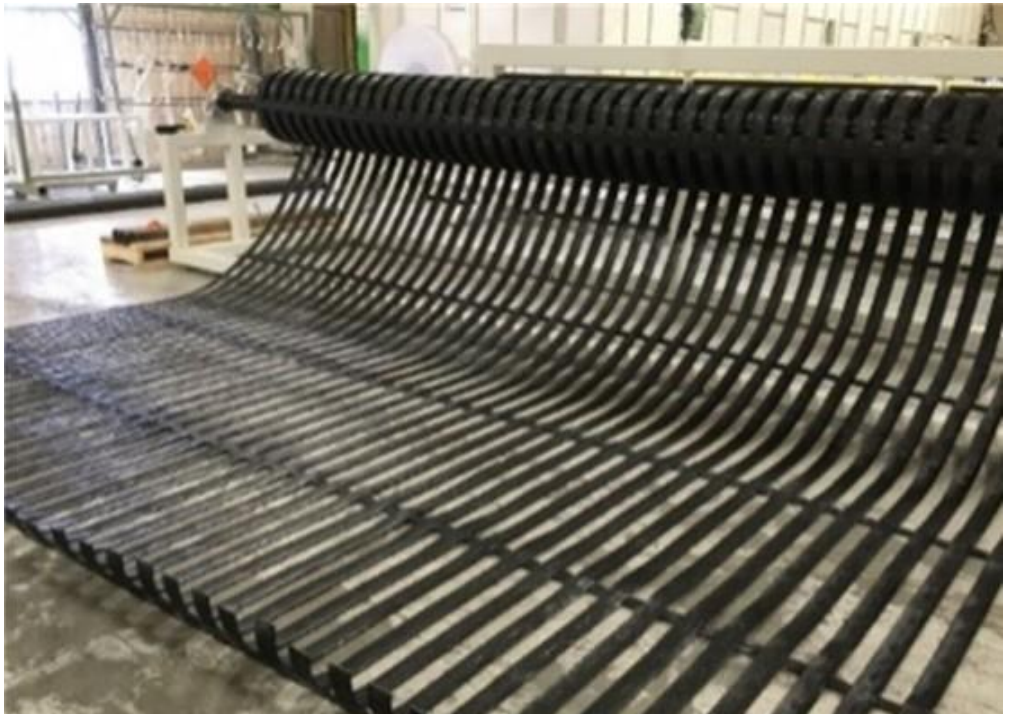
ENVIRONMENTAL PRODUCT DECLARATION

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

ArmaLynk - PET_{HS}

Reinforced Earth India Private Limited



EPD HUB, HUB-0978

Published on 22.12.2023, last updated on 22.12.2023, valid until 22.12.2028

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Reinforced Earth India Private Limited
Address	Arijuka Plot No. 255, 250, 251&252GIDC Industrial Estate, Hansalpur, Viramgam, District: Ahmedabad, INDIA
Contact details	info@terre-armee.com
Website	https://www.terre-armee.com

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.0, 1 Feb 2022
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	Anais Grandclerc
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	Lucas Pedro Berman, 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	ArmaLynk - PETHS
Additional labels	-
Product reference	AL300, AL400, AL500, AL600, AL700, AL800, AL900, AL1000, AL1100, AL1200, AL1300, AL1400, AL1500 and AL1600
Place of production	Arijuka Plot No. 255, 250, 251&252 GIDC Industrial Estate, Hansalpur, Viramgam, District: Ahmedabad, INDIA
Period for data	November 2022 - November 2023
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	0.96-0.32 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	3,00E+00
GWP-total, A1-A3 (kgCO2e)	3,00E+00
Secondary material, inputs (%)	0.546
Secondary material, outputs (%)	0.0
Total energy use, A1-A3 (kWh)	11.6
Total water use, A1-A3 (m3e)	4,63E-02

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Located in India, this factory is dedicated to produce geosynthetic reinforcements specifically designed for reinforced earth walls. With two distinct facilities, Arjikuja 1 and Arjikuja 2, specialized production lines are employed to manufacture high-quality geosynthetics. These products effectively enhance structural stability and adhere to rigorous standards of quality and safety.

PRODUCT DESCRIPTION

ArmaLynk-PET_{HS} is a soil reinforcement geosynthetic, manufactured from high tenacity polyester yarns, extruded and coated to form polymeric strips encased in Polyethylene sheath, and welded together to cross strips to generate a stable and strong geogrid structure. Some additives are also used but only represent less than 1% in mass when all added with an impact on the indicators even lower.
Technical characteristics of Armalynk are listed and detailed in the technical data sheet available through Terre Armée support teams.
For ArmaLynk-PET_{HS}, different grades are available from 300 kN to 1600 kN.

APPLICATIONS

1. Embankments over soft and very soft soils:
Embankment on soft soil reinforced with ArmaLynk provides additional stability to the embankment i.e. to prevent possible slips from occurring.

2. Reinforced embankment over areas prone to subsidence:
Reinforced embankment with ArmaLynk over areas prone to subsidence are the subset of basal reinforcement that aims to reduce the impact of collapse providing support to the embankment, while minimizing the failure in the surface deformation.

3. Piled embankment with basal reinforcement:
Structures founded over soft soils such as bridges, piers, and tanks commonly utilize piles to reduce settlements. The interaction between the piles, ArmaLynk and the granular fill provides an engineered system leading to more resilient infrastructure.

4. Piggyback landfill expansions:
High strength ArmaLynk geosynthetics can be efficiently used in combination with other Terre Armée products for landfill piggybacking to solve the ever-growing problem of waste materials disposal, especially for raising of the dykes over existing landfills and increasing the capacity of abandoned landfills.

5. Lagoon Closures:
ArmaLynk in combination with other Terre Armée products facilitates sludge lagoons remediation on soft to very soft ground condition together with special geotechnical stabilisation techniques and helps in land reclamation and redevelopment for various purposes like waste lagoon and sludge pond closures.

6. Access roads and load bearing platforms:
ArmaLynk when used in the ground improvement process of access road for heavy load movements and for load bearing platforms, induces stiffness to the soil underneath, improves lateral restraint, reduces the applied load on the soft soil and controls the differential settlement. It is used in the transition layer for distribution and transfer of load to rigid inclusions like stone columns or piles in soft foundation and optimises the requirement of such rigid inclusions.

Non-exhaustive list of standards for reference (without limitations) International technical reports ISO/TS 13434 and ISO/TR 20432 / EN 13249 / EN 13250 / EN 13251 / EN 13253 / EN 13254 / EN 13255 / EN 13257 / EN 13265

Further information can be found at https://www.terre-armee.com.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0	
Minerals	0	
Fossil materials	100	Asia
Bio-based materials	0	

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

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	kg
Mass per declared unit	1 kg
Functional unit	-
Reference service life	-

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/demol	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.

The manufacturing process is a co-extrusion process of LLDPE to coat channels of PET yarns to obtain strips and welded together to cross strips to generate a geogrid structure. The grid is supplied in rolled form with a steel core (40% of recycled steel) with sufficient strength to avoid collapse or other damage during transportation, handling, lifting and installation. Each roll is wrapped with plastic (PE strech&normal and PP woven sack) to protect the product from damage during shipping and handling. The water used for the manufacturing of the strips is provided in a closed circuit. The energy used for the production lines is purchased to a solar energy plant. The transportation distance of LLDPE from the supplier to the manufacturing plant, is equal to 5950 km from Pacific Asia (5250 km by boat and 700 km by lorry) and the transportation distances of carbon black and PET from the supplier to the manufacturing plant are respectively equal to 960 km and 414 km from India. The transportation distances considered for the packaging materials are equal to 100 km.

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 does not cause losses as products are packaged properly. Freight mode and distances for transportation from the production site to the construction site has been approached by an averaged transport scenario based on a barycentric method applied to sales on a representative year (an average of 10 000 km by boat and 1 150 km by lorry). The unloading process of ArmaLynk is by means of round steel tube inserted in the central steel core on all the roll length with a Forklift capacity of 3,5 MT more.

Regarding the installation process, a productivity ratio has been used to allocate the excavation/compaction works (diesel machine operation in hours and translated in Liters) needed to install the whole system (panels, reinforcements and backfill). It is based on an average reinforcement density and onsite building productivity ratio for a typical reinforced soil structure. Note that this system involves concrete panels (most common application). A 5% waste generation of ArmaLynk reinforcements has been considered during the installation phase. The steel core is sold for recycling after the installation phase. The packaging wastes (PE and PP) are considered incinerated after the installation phase. 50 km are considered from the construction site to the waste treatment location.

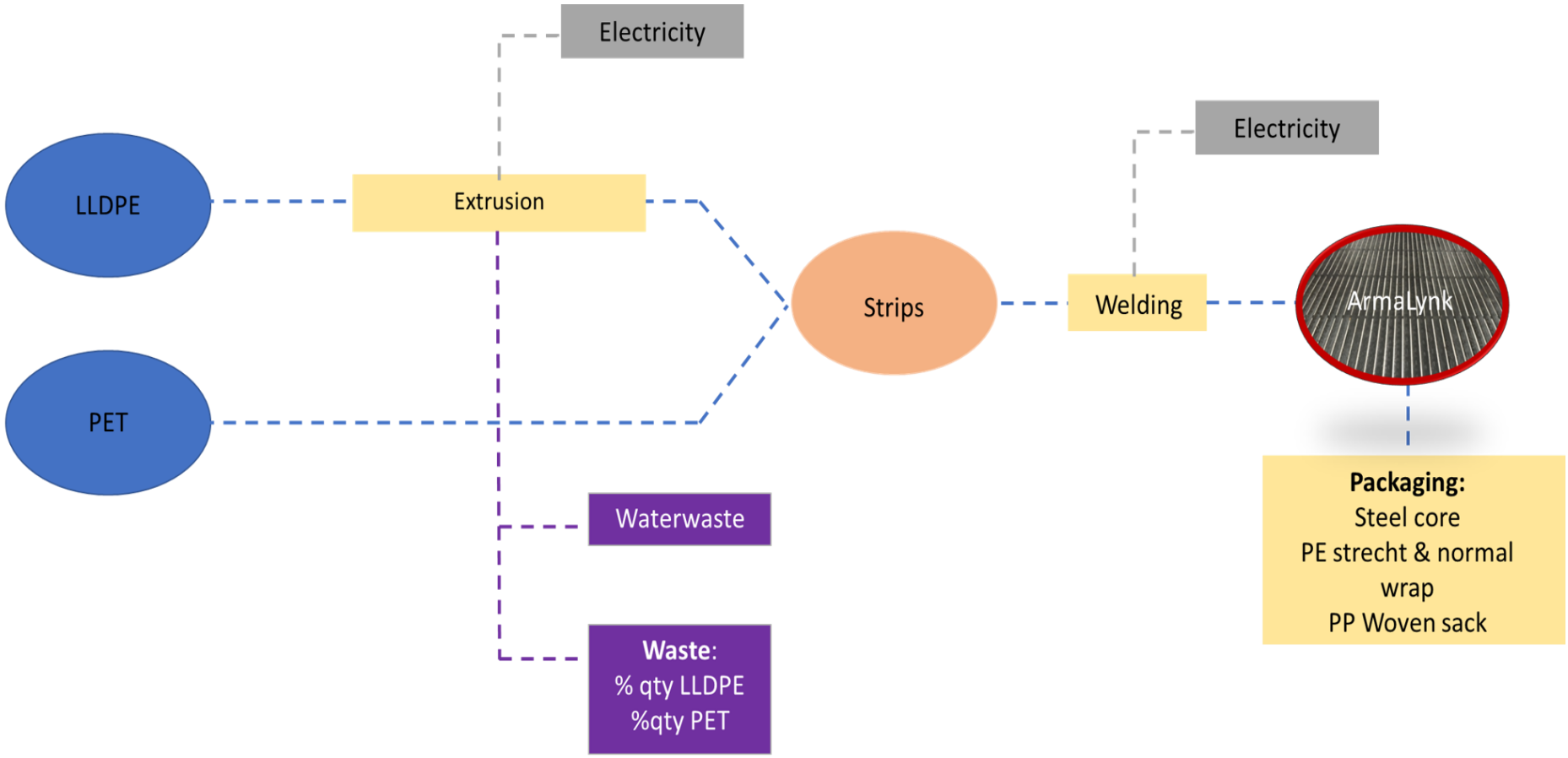
PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-c4, D)

For the end of life, a demolition ratio has been used to allocate the required operation of diesel machines (expressed in hours and translated in Liters of diesel) for dismantling the reinforced soil structure system (panels, reinforcements and backfill). As for the installation phase, this ratio has been calculated considering an average reinforcements density and onsite demolition productivity ratio for a typical reinforced soil structure. After circa 100 years of service life, retrieved PET and LLDPE are considered treated through waste disposal in a municipal solid waste incinerator (MSWI) (based on current practice and experience). Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is assumed as lorry which is the most common.

MANUFACTURING PROCESS



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	No allocation
Packaging materials	No allocation
Ancillary materials	Not applicable
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	Multiple products
Averaging method	Averaged by shares of total mass
Variation in GWP-fossil for A1-A3	0.96-0.32 %

Armalynk is sold in various grades (300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500 and 1600 kN). The best-selling grade is ArmaLynk-600 kN. We have therefore based ourselves on the best-selling grade to make the EPD. To demonstrate that this grade is a representative average, it is necessary to calculate GWP total for the product stage (A1-A3) for the worst case (the lowest grade), the best case (the highest grade) and the chosen representative average. The difference between GWP total of these three products must not exceed 50%. In ArmaLynk case, the difference between ArmaLynk-300 kN and ArmaLynk -600 kN is equal to 0,96% and the difference between ArmaLynk-1600 kN and ArmaLynk-600 kN is equal to 0,32%.

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. Ecoinvent v3.8 and One Click LCA databases were used 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_2e	2,68E+00	1,04E-01	2,16E-01	3,00E+00	2,15E-01	1,39E+00	MND	MND	MND	MND	MND	MND	MND	4,97E-01	4,69E-03	2,70E+00	0,00E+00	-3,45E+00
GWP – fossil	kg CO_2e	2,68E+00	1,04E-01	2,16E-01	3,00E+00	2,15E-01	1,39E+00	MND	MND	MND	MND	MND	MND	MND	4,96E-01	4,69E-03	2,70E+00	0,00E+00	-3,45E+00
GWP – biogenic	kg CO_2e	1,49E-04	0,00E+00	-1,49E-04	-4,07E-19	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP – LULUC	kg CO_2e	1,32E-03	5,12E-05	1,01E-04	1,47E-03	1,19E-04	1,90E-04	MND	MND	MND	MND	MND	MND	MND	4,94E-05	1,73E-06	9,20E-06	0,00E+00	-4,75E-04
Ozone depletion pot.	kg CFC_{-11}e	5,46E-06	2,32E-08	7,44E-09	5,49E-06	4,69E-08	5,11E-07	MND	MND	MND	MND	MND	MND	MND	1,06E-07	1,08E-09	2,37E-09	0,00E+00	-4,00E-08
Acidification potential	mol H^+e	1,11E-02	1,28E-03	9,48E-04	1,33E-02	3,70E-03	1,22E-02	MND	MND	MND	MND	MND	MND	MND	5,16E-03	1,99E-05	3,99E-04	0,00E+00	-2,62E-02
EP-freshwater[2)]	kg Pe	5,63E-05	7,20E-07	8,82E-06	6,58E-05	1,32E-06	7,00E-06	MND	MND	MND	MND	MND	MND	MND	1,64E-06	3,84E-08	3,31E-07	0,00E+00	-1,01E-04
EP-marine	kg Ne	1,94E-03	3,08E-04	2,03E-04	2,45E-03	9,01E-04	5,20E-03	MND	MND	MND	MND	MND	MND	MND	2,28E-03	5,90E-06	1,95E-04	0,00E+00	-3,30E-03
EP-terrestrial	mol Ne	2,12E-02	3,42E-03	1,89E-03	2,65E-02	1,00E-02	5,70E-02	MND	MND	MND	MND	MND	MND	MND	2,50E-02	6,51E-05	2,05E-03	0,00E+00	-3,80E-02
POCP ("smog")[3)]	kg NMVOCe	8,33E-03	9,59E-04	9,27E-04	1,02E-02	2,71E-03	1,58E-02	MND	MND	MND	MND	MND	MND	MND	6,89E-03	2,08E-05	4,95E-04	0,00E+00	-1,08E-02
ADP-minerals & metals[4)]	kg Sbe	2,34E-05	2,18E-07	2,69E-06	2,63E-05	4,16E-07	1,90E-06	MND	MND	MND	MND	MND	MND	MND	2,52E-07	1,10E-08	9,57E-08	0,00E+00	-1,53E-06
ADP-fossil resources	MJ	7,21E+01	1,52E+00	2,69E+00	7,63E+01	3,05E+00	1,87E+01	MND	MND	MND	MND	MND	MND	MND	6,68E+00	7,05E-02	2,81E-01	0,00E+00	-2,86E+01
Water use[5)]	m^3e depr.	1,80E+00	6,19E-03	9,22E-02	1,90E+00	1,17E-02	1,39E-01	MND	MND	MND	MND	MND	MND	MND	1,79E-02	3,15E-04	8,04E-02	0,00E+00	-1,31E-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	1,31E+00	1,54E-02	1,57E+00	2,90E+00	2,87E-02	2,31E-01	MND	MND	MND	MND	MND	MND	MND	3,82E-02	7,94E-04	5,99E-03	0,00E+00	-4,87E+00
Renew. PER as material	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	1,31E+00	1,54E-02	1,57E+00	2,90E+00	2,87E-02	2,31E-01	MND	MND	MND	MND	MND	MND	MND	3,82E-02	7,94E-04	5,99E-03	0,00E+00	-4,87E+00
Non-re. PER as energy	MJ	3,57E+01	1,52E+00	1,79E+00	3,90E+01	3,05E+00	1,68E+01	MND	MND	MND	MND	MND	MND	MND	6,68E+00	7,05E-02	2,81E-01	0,00E+00	-2,86E+01
Non-re. PER as material	MJ	3,64E+01	0,00E+00	-3,77E-01	3,61E+01	0,00E+00	-3,96E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-3,57E+01	0,00E+00	0,00E+00

Total use of non-re. PER	MJ	7,21E+01	1,52E+00	1,41E+00	7,50E+01	3,05E+00	1,64E+01	MND	MND	MND	MND	MND	MND	MND	6,68E+00	7,05E-02	-3,54E+01	0,00E+00	-2,86E+01
Secondary materials	kg	5,46E-03	4,95E-04	8,10E-03	1,41E-02	1,08E-03	6,53E-03	MND	MND	MND	MND	MND	MND	MND	2,61E-03	1,96E-05	4,25E-04	0,00E+00	-4,89E-03
Renew. secondary fuels	MJ	8,10E-05	3,62E-06	1,76E-05	1,02E-04	6,52E-06	2,44E-05	MND	MND	MND	MND	MND	MND	MND	8,54E-06	1,97E-07	1,89E-06	0,00E+00	-2,01E-03
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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	4,42E-02	1,70E-04	1,93E-03	4,63E-02	3,10E-04	3,23E-03	MND	MND	MND	MND	MND	MND	MND	4,06E-04	9,13E-06	1,92E-04	0,00E+00	-9,91E-03

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	1,17E-01	2,02E-03	4,24E-02	1,61E-01	4,08E-03	2,80E-02	MND	MND	MND	MND	MND	MND	MND	8,94E-03	9,34E-05	0,00E+00	0,00E+00	-2,67E-01
Non-hazardous waste	kg	2,17E+00	2,87E-02	2,86E-01	2,49E+00	5,25E-02	3,16E-01	MND	MND	MND	MND	MND	MND	MND	6,28E-02	1,54E-03	1,00E+00	0,00E+00	-4,29E+00
Radioactive waste	kg	4,40E-05	1,04E-05	2,32E-06	5,67E-05	2,10E-05	1,07E-04	MND	MND	MND	MND	MND	MND	MND	4,70E-05	4,71E-07	0,00E+00	0,00E+00	-3,63E-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	0,00E+00	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	1,60E-01	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 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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,58E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	2,60E+01	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_2e	2,56E+00	1,03E-01	1,51E-01	2,82E+00	2,14E-01	1,37E+00	MND	MND	MND	MND	MND	MND	MND	4,91E-01	4,64E-03	2,70E+00	0,00E+00	-3,34E+00
Ozone depletion Pot.	kg CFC_{-11}e	3,66E-06	1,84E-08	7,83E-09	3,68E-06	3,71E-08	3,71E-07	MND	MND	MND	MND	MND	MND	MND	8,40E-08	8,55E-10	2,06E-09	0,00E+00	-3,35E-08
Acidification	kg SO_2e	9,23E-03	1,02E-03	6,83E-04	1,09E-02	2,96E-03	8,80E-03	MND	MND	MND	MND	MND	MND	MND	3,68E-03	1,54E-05	2,78E-04	0,00E+00	-2,24E-02
Eutrophication	kg PO_4^3e	2,62E-03	1,34E-04	7,78E-04	3,53E-03	3,62E-04	2,24E-03	MND	MND	MND	MND	MND	MND	MND	8,53E-04	3,52E-06	2,42E-04	0,00E+00	-4,20E-03
POCP (“smog”)	kg C_2H_4e	5,88E-04	3,02E-05	1,11E-04	7,29E-04	8,23E-05	2,20E-04	MND	MND	MND	MND	MND	MND	MND	8,05E-05	6,03E-07	4,55E-06	0,00E+00	-1,06E-03
ADP-elements	kg Sbe	2,31E-05	2,13E-07	2,67E-06	2,60E-05	4,06E-07	1,87E-06	MND	MND	MND	MND	MND	MND	MND	2,48E-07	1,07E-08	8,23E-08	0,00E+00	-1,52E-06
ADP-fossil	MJ	7,21E+01	1,52E+00	2,69E+00	7,63E+01	3,05E+00	1,87E+01	MND	MND	MND	MND	MND	MND	MND	6,68E+00	7,05E-02	2,81E-01	0,00E+00	-2,86E+01

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.

Lucas Pedro Berman, as an authorized verifier acting for EPD Hub Limited
22.12.2023