ENVIRONMENTAL PRODUCT DECLARATION

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

STEEL REINFORCING BAR

EPD HUB, HUB-2740
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صلب ستيل
SOLB STEEL

Created with One Click LCA

Prepared by: شركة تقنية الجودة للاعتماد
Quality Techno Certification

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Solb Steel
Address	P.O. Box 111, Jizan 45971, Saudi Arabia
Contact details	+966 (011) 400 1845
Email Address	Abdulelah.adal@solbsteel.com
Website	https://www.solbsteel.com/ssc/

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 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with modules C1-C4, D
EPD author	Osama Alhuzebi
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Elisabet Amat, 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	Steel Reinforcing Bar
Product range	8 to 40 mm^2
Place of production	Saudi Arabia
Period for data	Calendar year 2024
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	-%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	2,26E+00
GWP-total, A1-A3 ($kgCO_2e$)	2,27E+00
Secondary material, inputs (%)	19.8
Secondary material, outputs (%)	0
Total energy use, A1-A3 (kWh)	6.95
Net freshwater use, A1-A3 (m^3)	0.02

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Solb Steel specializes in producing high-quality steel rebar and coils that meet both local and international standards, catering to the needs of domestic and global markets. Solb Steel produces hot-rolled steel rebar from high-quality steel billets, with meticulous attention to every engineering detail of the final product. This includes precise control over height, width, shape, and the spacing of ribs during the rolling and forming process, ensuring superior mechanical properties that meet both international and local standards.

The rebar produced by Solb Steel is certified with the SASO 1992/2 quality mark from the Saudi Standards, Metrology, and Quality Organization (SASO) and complies with international quality standards. Solb Steel is dedicated to achieving sustainable development, enhancing product quality, and fostering trust between the company and its employees, as well as with its clients. This commitment is deeply rooted in the company's philosophy and approach to business. With a strong commitment to sustainability and innovation, Solb Steel continuously invests in environmentally friendly technologies, emphasizing clean production and efficient resource use to contribute positively to the community and the environment.

PRODUCT DESCRIPTION

This EPD covers the rebar produced by Solb Steel Company. Rebar is a critical component in reinforced steel structures, essential for improving their strength and durability. Its ribbed surface design enhances its bond with concrete, ensuring a strong and reliable connection. With precise chemical composition and a carefully controlled manufacturing process, Solb Steel's rebar achieves superior mechanical properties, making it ideal for demanding and high-performance applications.
Further information can be found at: https://www.solbsteel.com/ssc/

PRODUCT RAW MATERIAL MAIN COMPOSITION

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

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

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

DECLARED UNIT

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	MND	MND	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)

At Solb Steel, the rebar production process begins with the import of steel billets from Qatar Steel, with cross-sections of 150mm x 150mm. These billets consist of a mix of 70% Direct Reduced Iron (DRI) and 30% recycled content. These billets undergo a gradual size reduction, first to 60mm x 60mm, then to 40mm x 40mm, before reaching the final diameter required by market demand. This carefully controlled process ensures precision and quality at every stage.

After the steel billets are preheated, they are reshaped to the desired diameter. This process takes place in a furnace equipped with water-cooling pipes and a closed-loop lubrication system, ensuring efficient heat management and operational sustainability. Following reshaping, the billets undergo a controlled cooling phase to remove any residual surface layer. The final size reduction is achieved through rolling, with water cooling applied throughout the process to maintain structural integrity and achieve the required dimensions. The production process relies on a variety of inputs, including scrap metal and other raw materials, carefully balanced to optimize cost-effectiveness and efficiency. Steel scrap is collected and shredded on-site, playing a crucial role in the production cycle, alongside the integration of alloy elements that enhance the steel's properties. Due to its negligible weight and impact in the steel industry, packaging has been excluded from the LCA as it falls below the cut-off criteria.

Powering the production requires energy from both primary and secondary sources. Pre-treatment of secondary materials, where necessary, streamlines the process, contributing to reduced waste and improved resource efficiency. Within the A2 transportation phase, raw materials are transported from their point of origin to the manufacturing plant, with internal packaging materials managed on-site to maintain efficiency.

TRANSPORT AND INSTALLATION (A4-A5)

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

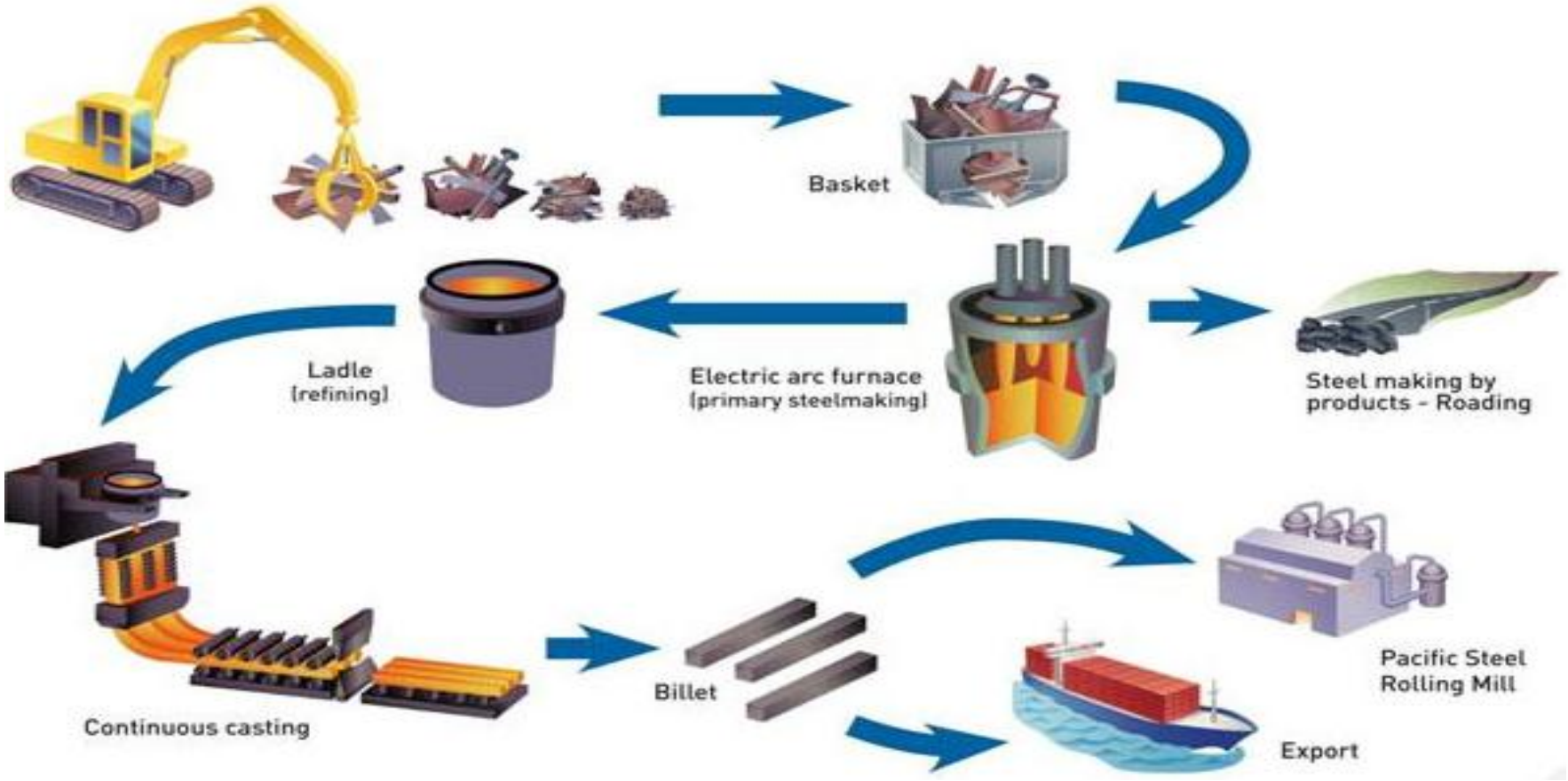
PRODUCT USE AND MAINTENANCE (B1-B7)

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)

The end-of-life stage for steel reinforcement begins with the demolition of the building, during which the product is removed and initially sorted onsite. The energy consumption of building machinery used in demolition is estimated at 0.01 kWh/kg of installed product. Following this, the discarded rebar is transported to either a recycling facility or a final disposal site. The assumed distance to the waste treatment plant is 100 km as an average. Waste processing phase includes the collection and handling of material streams designated for reuse, recycling, or energy recovery. With a service life exceeding 60 years, rebar typically reaches the end of its lifecycle alongside the building's demolition. According to the latest World Steel report 2020, 85% of steel is sent for recycling, while 15% is disposed of in landfills.

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

AVERAGES AND VARIABILITY

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

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 v3.10 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_2e	1,80E+00	5,17E-02	4,09E-01	2,27E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,61E-03	1,08E-02	2,31E-02	9,37E-04	-1,50E+00
GWP – fossil	kg CO_2e	1,80E+00	5,17E-02	4,09E-01	2,26E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,60E-03	1,08E-02	2,31E-02	9,36E-04	-1,50E+00
GWP – biogenic	kg CO_2e	0,00E+00	0,00E+00	0,00E+00	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
GWP – LULUC	kg CO_2e	8,49E-04	2,31E-05	1,62E-05	8,88E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,69E-07	4,82E-06	2,72E-05	5,35E-07	-7,25E-04
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	7,20E-09	7,63E-10	5,98E-08	6,77E-08	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,52E-11	1,59E-10	2,48E-10	2,71E-11	-5,99E-09
Acidification potential	mol H^+e	6,25E-03	1,76E-04	2,42E-03	8,84E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,25E-05	3,67E-05	2,47E-04	6,64E-06	-6,02E-03
EP-freshwater[2)]	kg Pe	6,17E-04	4,02E-06	5,39E-06	6,27E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,04E-07	8,38E-07	1,25E-05	7,70E-08	-5,53E-04
EP-marine	kg Ne	1,43E-03	5,79E-05	5,11E-04	2,00E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,51E-05	1,21E-05	5,49E-05	2,53E-06	-1,29E-03
EP-terrestrial	mol Ne	1,54E-02	6,30E-04	5,40E-03	2,14E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,65E-04	1,31E-04	6,19E-04	2,76E-05	-1,39E-02
POCP ("smog")[3)]	kg NMVOCe	5,61E-03	2,60E-04	1,55E-03	7,42E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,93E-05	5,41E-05	1,82E-04	9,90E-06	-4,59E-03
ADP-minerals & metals[4)]	kg Sbe	1,36E-06	1,44E-07	1,70E-07	1,67E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,29E-09	3,00E-08	1,36E-06	1,49E-09	-1,14E-05
ADP-fossil resources	MJ	1,78E+01	7,50E-01	5,77E+00	2,43E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,72E-02	1,56E-01	2,73E-01	2,30E-02	-1,45E+01
Water use[5)]	m^3e depr.	7,55E-01	3,70E-03	2,13E-02	7,80E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,18E-04	7,72E-04	4,31E-03	6,63E-05	-3,90E-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.

ADDITIONAL (OPTIONAL) 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
Particulate matter	Incidence	1,53E-07	5,17E-09	1,91E-08	1,77E-07	MND	MND	MND	MND	MND	MND	MND	MND	MND	9,25E-10	1,08E-09	3,45E-09	1,51E-10	-1,35E-07
Ionizing radiation[6]	kBq U235e	3,34E-02	6,53E-04	1,06E-02	4,46E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,09E-05	1,36E-04	9,79E-04	1,44E-05	-3,07E-02
Ecotoxicity (freshwater)	CTUe	5,08E+00	1,06E-01	2,26E+00	7,45E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,60E-03	2,21E-02	1,58E-01	1,93E-03	-4,66E+00
Human toxicity, cancer	CTUh	1,95E-09	8,53E-12	8,26E-11	2,05E-09	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,71E-13	1,78E-12	1,85E-11	1,73E-13	-1,70E-09
Human tox. non-cancer	CTUh	7,27E-09	4,85E-10	1,15E-09	8,90E-09	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,87E-12	1,01E-10	1,18E-09	3,97E-12	-1,30E-08
SQP[7]	-	4,07E+00	7,55E-01	7,11E-02	4,90E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,30E-03	1,57E-01	5,16E-01	4,52E-02	-4,77E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

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	6,86E-01	1,03E-02	1,97E-02	7,16E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,99E-04	2,14E-03	4,24E-02	2,22E-04	-1,43E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	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
Total use of renew. PER	MJ	6,86E-01	1,03E-02	1,97E-02	7,16E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,99E-04	2,14E-03	4,24E-02	2,22E-04	-1,43E+00
Non-re. PER as energy	MJ	1,78E+01	7,50E-01	5,77E+00	2,43E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,72E-02	1,56E-01	2,73E-01	2,30E-02	-1,45E+01
Non-re. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	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
Total use of non-re. PER	MJ	1,78E+01	7,50E-01	5,77E+00	2,43E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,72E-02	1,56E-01	2,73E-01	2,30E-02	-1,45E+01
Secondary materials	kg	1,98E-01	3,19E-04	1,51E-04	1,98E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,96E-05	6,65E-05	3,16E-04	5,78E-06	-1,30E-01
Renew. secondary fuels	MJ	7,62E-05	4,05E-06	2,99E-07	8,05E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,12E-08	8,45E-07	1,43E-05	1,20E-07	-1,72E-04
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	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
Use of net fresh water	m^3	1,65E-02	1,11E-04	2,07E-03	1,87E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,12E-06	2,31E-05	1,19E-04	2,39E-05	-8,44E-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	3,39E-01	1,27E-03	1,54E-03	3,41E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,25E-05	2,65E-04	2,13E-03	2,54E-05	-6,09E-01
Non-hazardous waste	kg	3,49E+00	2,35E-02	5,20E-02	3,56E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	7,15E-04	4,90E-03	5,98E-02	5,80E-04	-3,13E+00
Radioactive waste	kg	8,30E-06	1,62E-07	1,69E-05	2,54E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,18E-09	3,38E-08	2,46E-07	3,58E-09	-7,76E-06

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	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 recycling	kg	0,00E+00	0,00E+00	0,00E+00	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 rec	kg	0,00E+00	0,00E+00	0,00E+00	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	0,00E+00	0,00E+00	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

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	1,79E+00	5,14E-02	4,01E-01	2,24E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,59E-03	1,07E-02	2,30E-02	9,28E-04	-1,49E+00
Ozone depletion Pot.	kg CFC_{-11}e	6,44E-09	6,09E-10	4,69E-08	5,39E-08	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,37E-11	1,27E-10	2,06E-10	2,15E-11	-5,34E-09
Acidification	kg SO_2e	5,03E-03	1,35E-04	1,95E-03	7,12E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,29E-05	2,80E-05	1,99E-04	4,91E-06	-4,89E-03
Eutrophication	kg PO_4^3e	8,87E-04	3,28E-05	1,97E-04	1,12E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,34E-06	6,83E-06	2,83E-05	1,56E-06	-8,16E-04
POCP (“smog”)	kg C_2H_4e	7,70E-04	1,20E-05	8,21E-05	8,64E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,71E-06	2,50E-06	1,18E-05	4,65E-07	-6,49E-04
ADP-elements	kg Sbe	1,24E-06	1,41E-07	1,69E-07	1,55E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,26E-09	2,93E-08	1,36E-06	1,46E-09	-1,13E-05
ADP-fossil	MJ	1,72E+01	7,39E-01	5,76E+00	2,37E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,68E-02	1,54E-01	2,57E-01	2,28E-02	-1,40E+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.

Elisabet Amat, as an authorized verifier acting for EPD Hub Limited.
21.02.2025