

ENVIRONMENTAL PRODUCT DECLARATION

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

FABRICATED STEEL PRODUCTS

EPD HUB, HUB-2376
Published on 14.02.2025, last updated on 14.02.2025, valid until 13.02.2030

Created with One Click LCA

Prepared by:

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Hassan Allam Steel
Address	**H.A.Construction (H.A.C)** Yehia Zakaria St., Industrial Zone-Behind Sheraton Heliopolis Buildings Cairo-Egypt **H.A.Construction Steel Division** K.28 Alex-Cairo Desert Road, Alexandria-Egypt
Website	www.hassanallam.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	Manufactured 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

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Hossam Jacoup, MASADER | Environmental and Energy Services

EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Haiha Nguyen, 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 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	Fabricated steel products
Place of production	Egypt
City/Province	Alexandria Governorate
Period for data	Calendar year 2023
Averaging in EPD	No averaging

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 ton
Declared unit mass	1000 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	1,19E+03
GWP-total, A1-A3 ($kgCO_2e$)	1,15E+03
Secondary material, inputs (%)	98.7
Secondary material, outputs (%)	0
Total energy use, A1-A3 (kWh)	6060
Net freshwater use, A1-A3 (m3)	21.5

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0.1% (1000 ppm).

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Hassan Allam Holding is a leading Egyptian group specializing in engineering, construction, investment, and development. The group operates across diverse sectors, including infrastructure, energy, water, industry, logistics, petrochemicals, and large-scale complex projects in Egypt and the MENA region.

Hassan Allam Construction, a subsidiary, is one of Egypt's largest and oldest engineering and construction companies in the MENA region. It focuses on executing large-scale, complex projects such as power stations, water and wastewater treatment facilities, industrial and petrochemical plants, as well as high-end residential, commercial developments, roads, and bridges.

The Steel Division is among Egypt's top providers of fabricated steel structures, serving both the Group's internal projects and external clients. With a focus on delivering high-quality steel structures for mega projects, the division ensures on-time and on-budget completion. Raw materials are sourced as steel plates, which are cut, assembled, and welded into customized steel profiles based on project-specific designs.

The steel manufacturing plant supports a wide range of complex projects, including power stations, industrial plants, oil and gas developments, and commercial and residential buildings. The facility boasts an annual production capacity of over 30,000 tons of steel structures and 5,000 tons of plate work, including tanks, vessels, and ducts.

OUR CLIENTS

PRODUCT DESCRIPTION

This EPD represents fabricated steel products produced at Hassan Allam, tailored to various project-specific designs and built-up sections. These products include a range of steel profiles such as H-sections, I-sections, channels, unequal and equal angle sections, T-sections, square, rectangular, and circular hollow sections. **The declared unit for this EPD is 1 ton of fabricated steel products.**

INFORMATION	DESCRIPTION
PRODUCT IDENTIFICATION	Fabricated steel products
PLANT FEATURES	Production capacity of over 30,000 tons of steel structures and 5,000 tons of plate work.
	Latest technology and software used for efficient resource utilization and client specifications.
	Design and Engineering Department fully computerized, delivering economical structures swiftly.
	Capable of supplying complex projects like power stations, industrial plants, and commercial developments.
MARKET SECTORS	INDUSTRIAL, OIL & GAS, PETROCHEMICALS, POWER & ENERGY, TRANSPORTATION, BUILDINGS

TECHNICAL INFORMATION

INFORMATION	%	
WELDABILITY	PCM	0.17
	Ceq (IIW)	0.24
CHEMICAL COMPOSITION	AES	0.07

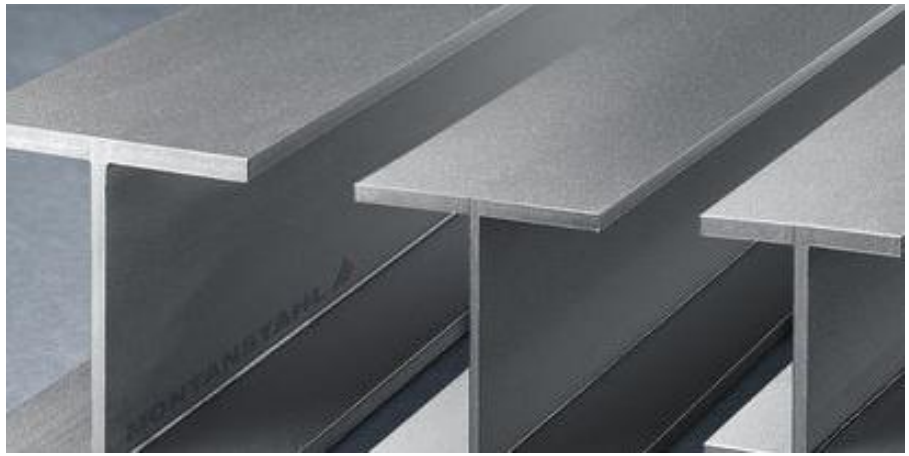
CONTENT INFORMATION

MATERIAL/CHEMICAL INPUT	%
Fe	99
C, Mn, P, S, Si, Al, Cu, Cr, Ni, Mo, V, Nb, Ti	1

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

BIOGENIC CARBON	KG C
Biogenic carbon content in product	0
Biogenic carbon content in packaging	11.36



FUNCTIONAL UNIT

DECLARED UNIT	1 ton
MASS PER DECLARED UNIT	1 ton
REFERENCE SERVICE LIFE	The Reference Service Life (RSL) of fabricated steel products is the RSL of the structure in which they are installed. A medium RSL of 50 years can be accepted.
PRE-CONSUMER RECYCLED CONTENT	4%
POST-CONSUMER RECYCLED CONTENT	96%

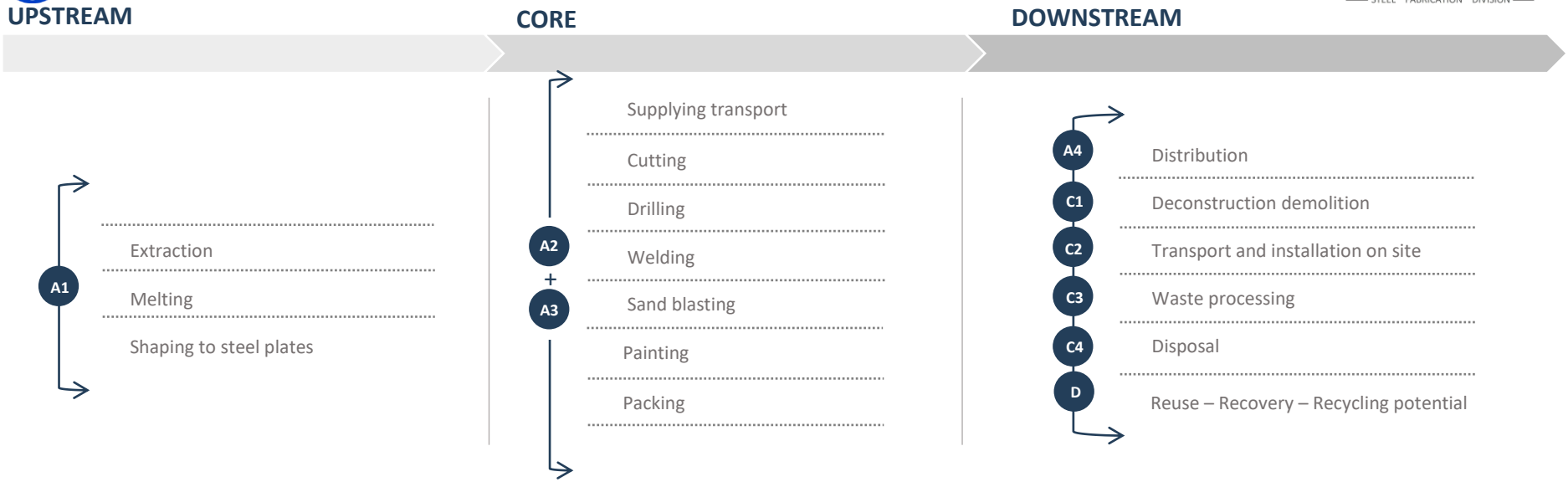


PRODUCT LIFE-CYCLE

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.



A1 | RAW MATERIALS

The A1 stage covers the extraction, production, and preparation of raw materials sourced from Egypt and Turkey, used in the production of steel plates. These plates are then fabricated into customized steel profiles. Both local and international suppliers are involved in managing this process.

The primary raw materials are steel profiles and sheets produced from pre-consumer and post-consumer scrap steel using an Electric Arc Furnace (EAF). No additional raw materials are included in this product system. The steel supplied to Hassan Allam for cut and bent prefabricated reinforcement units consists of 96% post-consumer scrap and 4% pre-consumer scrap.

A2 | TRANSPORTATION

During the A2 transportation phase, we oversee the movement of raw materials from their production or collection sites to our manufacturing plant, as well as the internal transportation of packaging materials within our facility. In total, approximately 9,000 tons of locally sourced steel plates are transported, along with around 11,300 tons of imported materials, including plates, standard beams, and box sections.

A3 | MANUFACTURING

At Hassan Allam, prior to fabrication, shop drawings and design connections are prepared by HAS and submitted for client approval before the commencement of work. Upon receiving materials, mill certificates for steel and welding consumables (e.g., electrodes, flux) will be provided to ensure conformity with the required chemical composition and mechanical properties. Materials are visually inspected to ensure they are free from pitting, rolling seams, overlaps, slag, or non-metallic inclusions. The thickness of the steel plates, typically available in 6mm, 8mm, 10mm, 12mm, and 25mm, will be checked using a vernier caliper to detect any deviations that could impact design requirements or standard code acceptance criteria. Welding Procedure Specifications (WPS), Procedure Qualification Records (PQR), and certifications for welders will be reviewed to ensure compliance with EN 1090-2 standards.

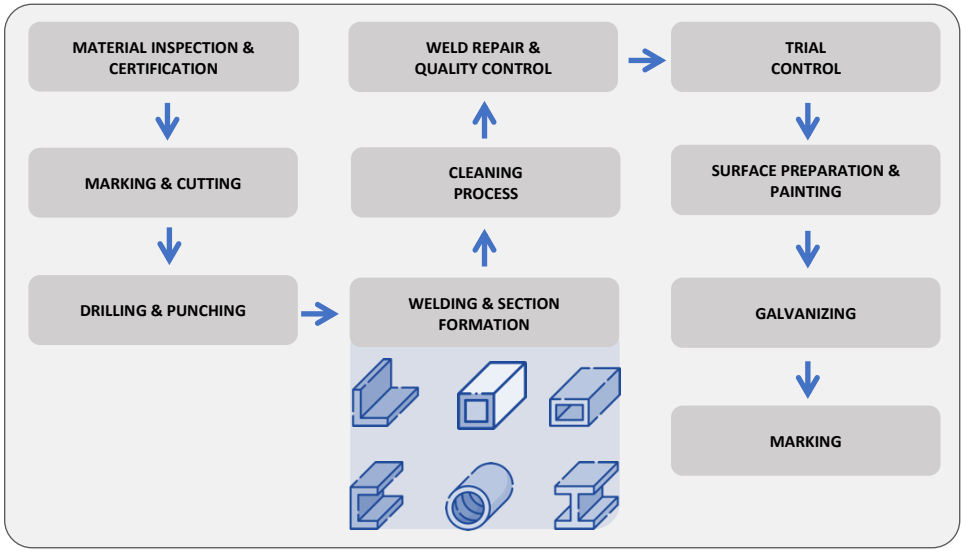
Material components are labeled in accordance with the part list using paint markers. For pieces that require further subdivision, the original markings are transferred by the layout team and verified by inspectors. Thicker plates are cut using flame steel cutting machines, while plasma steel cutting is utilized for both thick and thin plates. Plasma steel cutting is a more efficient and environmentally friendly option, producing significantly less slag and fewer oxides. Its cleaner, more precise cuts minimize material waste and reduce the need for extensive grinding or post-processing. After cutting, all edges are ground to remove slag and oxides, ensuring compliance with AWS D1.1 tolerance standards. Universal ironworkers and circular saws are used for cutting UPN, IPE, and angle profiles.

Drilling of hot-rolled sections is completed using CNC machines. For plates, fixed and magnetic drillers are employed, with the option to punch holes 2mm smaller than the final diameter, followed by reaming. All burrs and sharp edges are removed post-drilling, and periodic checks of punching capabilities ensure precision. Edges
to be welded are prepared by grinding to guarantee smooth, uniform surfaces free of defects that could compromise weld quality.

Welded sections include a variety of steel profiles such as H-sections, I-sections, channels, angles, T-sections, and hollow sections. Welds are visually inspected, and straightness of beam flanges is verified using straightening machines to correct any misalignments caused by thermal stresses. Slag and contaminants are removed after each welding layer and upon completion of the weld. All welded joints are cleaned before painting, ensuring that no spatter, fume deposits, or other surface impurities remain.

Rejected welds are marked with yellow and repaired accordingly. Excess weld metal is removed without damaging the base material. After fabrication, welds undergo a visual inspection to meet required profiles and dimension specifications. If distortions such as warping or bending are detected, mechanical or flame straightening is performed according to EN 1090-2 standards. Final dimensional checks are conducted, and non-destructive testing (NDT) is applied where necessary, in line with project codes. If specified by the client, a shop trial assembly is performed using temporary bolts of the same size. Dimensions are checked against assembly drawings. During the cutting and machining process, manufacturing waste, including scraps and offcuts, typically amounts to about 10%. To mitigate this waste, we focus on minimizing scrap and offcut ratios through the use of advanced cutting programs for nesting. This technique optimizes the arrangement of parts on a material sheet, significantly reducing waste. Additionally, we implement strategies to repurpose offcuts in other orders whenever feasible, further enhancing material efficiency and minimizing overall waste.

Steel surfaces are prepared for painting according to project specifications. Primer coats are applied on the same day as surface preparation. Defects such as uncoated areas or rust are addressed before applying subsequent coats. Painting is carefully executed on all edges, corners, and complex shapes. Where galvanizing is required, all surfaces are cleaned by pickling or blast cleaning per SSPC standards. Structural steel is hot dipped according to ASTM A153, and galvanized parts are inspected, with excess zinc removed. Structural steel members are marked with identification details such as fabricator sheet numbers and piece marks. For galvanized steel, these marks are embossed on steel plates and firmly affixed to each piece. This version streamlines the process for clarity and precision, enhancing readability while maintaining technical detail. For any package, the following information must be included: the released drawing number, a detailed packing description, and the dispatch number. Additionally, the package should have a unique packing number, along with the quantity of each unit, the unit weight, and the total weight. The length and width dimensions of the package must also be clearly specified. By 2030, the goal is to source 100% of energy needs from renewable energy sources.











A4
Transport

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. The final product is transported from the HAS plant in Suez Governorate to Saudi Arabia.

The total weight of transported products is assumed as 1 ton plus packaging. Transportation impacts that occur from the delivery of the product covers direct exhaust emissions of fuel, environmental impacts of fuel production, as well as related infrastructure emissions.

A5
Assembly

Once delivered to the construction site, fabricated steel components are distributed and installed by trained professionals following local and national standards. Cranes and lifting equipment are used to precisely position the steel elements, ensuring efficient and safe assembly.

The installation process includes energy consumption from equipment such as cranes. Waste treatment of packaging materials is also accounted for.

C1
Deconstruction /demolition

Dismantling and demolition operations required to remove the product from the building. Initial onsite sorting of the materials is included as well.

C2
Transport

Transportation of the discarded product as part of the waste processing (to recycling site or to a final disposal site).

C3
Waste processing

Waste processing, including collection of waste fraction from deconstruction and waste processing of material flows intended for reuse, recycling and energy recovery.

The recycling rate is set at 85% (World Steel Association Report, 2020) with the remaining 15% allocated to disposal in Module C4.

C4
Disposal

Steel reinforcement has a service life of 60+ years, and its end of life is with its end-of-life stage typically aligning with the building's demolition.

Nearly 100% of fabricated steel from a demolition site is either separated for reuse on other projects or sent to a metal recycling facility within the country of installation.

D
Reuse - Recovery - Recycling potential

Module D includes the recycling and material recovery of the metals, as well as the benefits of energy flows leaving the assessed system. For the recovered metal sent to recycling, the burden from the recycling process and net benefit of this recycling is reported in module D. The net benefit consists of the virgin material content replacing alternative material production.

As stated in the geographical scope, considering that the fabricated steel products will be installed and used in Saudi Arabia, the end-of-life stage has been modelled for the most applicable scenario in the specific regions.

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 materials	No allocation
Ancillary materials	Allocated by mass
Manufacturing energy and waste	Allocated by mass

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Representative product
Variation in GWP-fossil for A1-A3	+0.48%

The representative product Fabricated steel with Plasma cutting was the most sold product during the studied period. Compared with this product, Fabricated steel with Flame cutting has a 0.48% higher in GWP-fossil A1-A3 due to slightly higher consumption in cutting gases.

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 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	9,20E+02	3,85E+01	1,93E+02	1,15E+03	1,41E+02	6,41E+01	MND	MND	MND	MND	MND	MND	MND	3,31E+00	3,37E+01	2,22E+01	7,95E-01	-7,87E+01
GWP – fossil	kg CO_2e	9,21E+02	3,84E+01	2,29E+02	1,19E+03	1,41E+02	2,83E+01	MND	MND	MND	MND	MND	MND	MND	3,31E+00	3,37E+01	2,20E+01	7,94E-01	-3,17E+01
GWP – biogenic	kg CO_2e	-2,64E+00	1,21E-02	-3,59E+01	-3,85E+01	4,95E-02	3,58E+01	MND	MND	MND	MND	MND	MND	MND	6,06E-04	1,30E-02	1,07E-01	5,17E-04	-4,71E+01
GWP – LULUC	kg CO_2e	8,94E-01	2,18E-02	9,67E-02	1,01E+00	6,63E-02	2,13E-02	MND	MND	MND	MND	MND	MND	MND	3,30E-04	1,24E-02	2,87E-02	7,50E-04	-2,81E-03
Ozone depletion pot.	kg $CFC_{-11}e$	5,86E-05	8,17E-06	1,62E-05	8,29E-05	3,13E-05	2,07E-06	MND	MND	MND	MND	MND	MND	MND	7,07E-07	7,75E-06	2,37E-06	3,21E-07	-8,98E-07
Acidification potential	mol H^+e	4,52E+00	7,60E-01	5,85E-01	5,87E+00	1,71E+00	1,34E-01	MND	MND	MND	MND	MND	MND	MND	3,44E-02	1,43E-01	2,52E-01	7,46E-03	-2,19E-01
EP-freshwater[2]	kg Pe	4,32E-02	2,17E-04	3,35E-03	4,68E-02	9,75E-04	9,52E-04	MND	MND	MND	MND	MND	MND	MND	1,10E-05	2,76E-04	9,58E-04	8,32E-06	-8,75E-04
EP-marine	kg Ne	8,77E-01	1,91E-01	1,51E-01	1,22E+00	4,42E-01	3,65E-02	MND	MND	MND	MND	MND	MND	MND	1,52E-02	4,24E-02	5,36E-02	2,58E-03	-2,59E-02
EP-terrestrial	mol Ne	9,73E+00	2,12E+00	1,42E+00	1,33E+01	4,90E+00	3,92E-01	MND	MND	MND	MND	MND	MND	MND	1,67E-01	4,67E-01	6,17E-01	2,84E-02	-2,88E-01
POCP ("smog")[3]	kg NMVOCe	3,99E+00	5,63E-01	4,17E-01	4,97E+00	1,36E+00	1,32E-01	MND	MND	MND	MND	MND	MND	MND	4,59E-02	1,50E-01	1,69E-01	8,27E-03	-8,44E-02
ADP-minerals & metals[4]	kg Sbe	3,42E-03	6,97E-05	5,87E-04	4,08E-03	2,93E-04	2,24E-04	MND	MND	MND	MND	MND	MND	MND	1,68E-06	7,89E-05	2,52E-03	1,82E-06	-1,86E-05
ADP-fossil resources	MJ	1,34E+04	5,25E+02	3,71E+03	1,77E+04	2,02E+03	2,95E+02	MND	MND	MND	MND	MND	MND	MND	4,45E+01	5,06E+02	2,63E+02	2,18E+01	-3,07E+02
Water use[5]	m^3e depr.	7,37E+02	1,95E+00	6,44E+01	8,04E+02	8,32E+00	7,05E+00	MND	MND	MND	MND	MND	MND	MND	1,20E-01	2,26E+00	4,49E+00	6,91E-02	-1,99E-01

1) Indicator of potential global warming due to emissions of greenhouse gases to the air. Divided into 3 subcategories based on the emission source: (1) fossil resources, (2) bio-based resources and (3) land use change; 2) Indicator of the enrichment of the freshwater ecosystem with nutritional elements, due to the emission of nitrogen or phosphor-containing compounds; 3) Indicators of emissions of gases that affect the creation of photochemical ozone in the lower atmosphere (smog) catalysed by sunlight; 4) Indicator of the depletion of natural non-fossil resources; 5) Indicator of the relative amount of water used, based on regionalized water scarcity factors.

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	5,58E-05	2,65E-06	4,91E-06	6,33E-05	1,30E-05	2,68E-06	MND	MND	MND	MND	MND	MND	MND	9,22E-07	3,88E-06	3,44E-06	1,50E-07	-3,96E-06
Ionizing radiation[6]	kBq U235e	3,36E+01	2,46E+00	6,66E+00	4,28E+01	9,56E+00	1,38E+00	MND	MND	MND	MND	MND	MND	MND	2,05E-01	2,41E+00	1,58E+00	9,85E-02	-3,28E-01
Ecotoxicity (freshwater)	CTUe	2,33E+04	4,01E+02	1,89E+03	2,56E+04	1,69E+03	1,14E+03	MND	MND	MND	MND	MND	MND	MND	2,68E+01	4,55E+02	1,24E+03	1,42E+01	-9,41E+02
Human toxicity, cancer	CTUh	3,50E-06	1,84E-08	9,92E-08	3,62E-06	5,74E-08	9,59E-08	MND	MND	MND	MND	MND	MND	MND	1,03E-09	1,12E-08	3,69E-08	3,55E-10	-7,54E-09
Human tox. non-cancer	CTUh	1,91E-05	3,39E-07	1,15E-06	2,06E-05	1,56E-06	4,82E-07	MND	MND	MND	MND	MND	MND	MND	1,94E-08	4,50E-07	1,59E-06	9,29E-09	-2,01E-07
SQP[7]	-	1,67E+03	3,35E+02	5,61E+03	7,62E+03	1,83E+03	1,12E+02	MND	MND	MND	MND	MND	MND	MND	5,79E+00	5,83E+02	5,25E+02	4,66E+01	-1,81E+02

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	1,08E+03	4,74E+00	6,87E+02	1,78E+03	2,06E+01	2,26E+01	MND	MND	MND	MND	MND	MND	MND	2,54E-01	5,70E+00	4,06E+01	1,89E-01	-3,22E+01
Renew. PER as material	MJ	0,00E+00	0,00E+00	3,14E+02	3,14E+02	0,00E+00	-3,14E+02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,14E+02
Total use of renew. PER	MJ	1,08E+03	4,74E+00	1,00E+03	2,09E+03	2,06E+01	-2,92E+02	MND	MND	MND	MND	MND	MND	MND	2,54E-01	5,70E+00	4,06E+01	1,89E-01	2,82E+02
Non-re. PER as energy	MJ	1,59E+04	5,25E+02	3,64E+03	2,00E+04	2,02E+03	2,95E+02	MND	MND	MND	MND	MND	MND	MND	4,45E+01	5,06E+02	2,63E+02	2,18E+01	-3,07E+02
Non-re. PER as material	MJ	0,00E+00	0,00E+00	6,82E+01	6,82E+01	0,00E+00	-4,25E+01	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	1,59E+04	5,25E+02	3,71E+03	2,01E+04	2,02E+03	2,53E+02	MND	MND	MND	MND	MND	MND	MND	4,45E+01	5,06E+02	2,63E+02	2,18E+01	-3,07E+02
Secondary materials	kg	9,87E+02	1,93E-01	1,34E+00	9,88E+02	6,51E-01	1,48E+00	MND	MND	MND	MND	MND	MND	MND	1,74E-02	1,40E-01	2,83E-01	4,57E-03	-1,41E-02
Renew. secondary fuels	MJ	5,74E-03	1,05E-03	8,33E+00	8,34E+00	4,90E-03	6,22E-03	MND	MND	MND	MND	MND	MND	MND	5,70E-05	1,42E-03	1,44E-02	1,19E-04	-1,89E-02
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	1,99E+01	5,05E-02	1,55E+00	2,15E+01	2,30E-01	1,37E-01	MND	MND	MND	MND	MND	MND	MND	2,70E-03	6,55E-02	1,28E-01	2,38E-02	-5,38E-02

8) Use of renewable primary energy, excluding renewable primary energy resources used as raw materials.

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	1,83E+01	7,06E-01	5,18E+00	2,42E+01	2,70E+00	6,43E+00	MND	MND	MND	MND	MND	MND	MND	5,96E-02	6,71E-01	2,03E+00	0,00E+00	-1,41E+00
Non-hazardous waste	kg	2,19E+02	8,60E+00	9,57E+01	3,23E+02	3,89E+01	3,68E+01	MND	MND	MND	MND	MND	MND	MND	4,19E-01	1,10E+01	5,13E+01	1,51E+02	-1,04E+01
Radioactive waste	kg	4,96E-02	3,61E-03	3,79E-03	5,70E-02	1,37E-02	9,45E-04	MND	MND	MND	MND	MND	MND	MND	3,13E-04	3,38E-03	1,16E-03	0,00E+00	-3,57E-04

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	3,73E-02	0,00E+00	0,00E+00	3,73E-02	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 energy recovery	kg	2,17E-10	0,00E+00	0,00E+00	2,17E-10	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	3,10E+01	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	9,18E+02	3,81E+01	2,26E+02	1,18E+03	1,40E+02	2,80E+01	MND	MND	MND	MND	MND	MND	MND	3,27E+00	3,33E+01	2,16E+01	7,78E-01	-3,10E+01
Ozone depletion Pot.	kg CFC_{-11}e	7,68E-05	6,47E-06	1,40E-05	9,72E-05	2,48E-05	1,80E-06	MND	MND	MND	MND	MND	MND	MND	5,60E-07	6,13E-06	1,91E-06	2,54E-07	-7,42E-07
Acidification	kg SO_2e	3,89E+00	6,06E-01	4,75E-01	4,97E+00	1,35E+00	1,06E-01	MND	MND	MND	MND	MND	MND	MND	2,45E-02	1,11E-01	2,04E-01	5,64E-03	-1,88E-01
Eutrophication	kg PO_4^3e	5,95E-01	7,42E-02	1,37E-01	8,07E-01	1,90E-01	4,77E-02	MND	MND	MND	MND	MND	MND	MND	5,69E-03	2,52E-02	6,34E-02	1,22E-03	-3,08E-02
POCP ("smog")	kg C_2H_4e	3,90E-01	1,63E-02	3,16E-02	4,37E-01	3,93E-02	8,72E-03	MND	MND	MND	MND	MND	MND	MND	5,36E-04	4,32E-03	7,75E-03	2,36E-04	-9,26E-03
ADP-elements	kg Sbe	3,42E-03	6,79E-05	5,81E-04	4,07E-03	2,85E-04	2,23E-04	MND	MND	MND	MND	MND	MND	MND	1,65E-06	7,64E-05	2,52E-03	1,80E-06	-1,86E-05
ADP-fossil	MJ	1,34E+04	5,25E+02	3,71E+03	1,77E+04	2,02E+03	2,95E+02	MND	MND	MND	MND	MND	MND	MND	4,45E+01	5,06E+02	2,63E+02	2,18E+01	-3,07E+02

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

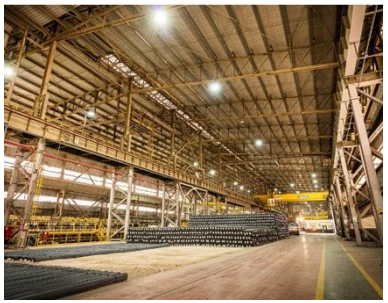
Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	9,22E+02	3,84E+01	2,29E+02	1,19E+03	1,41E+02	2,83E+01	MND	MND	MND	MND	MND	MND	MND	3,31E+00	3,37E+01	2,21E+01	7,95E-01	-3,17E+01

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 characterization factors for the flows - CH_4 fossil, CH_4 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 CO_2 is set to zero.

* All environmental-related emissions are expressed with a comma as the decimal separator.







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.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited
14.02.2025

VERIFIED ISO 14025

Prepared by: