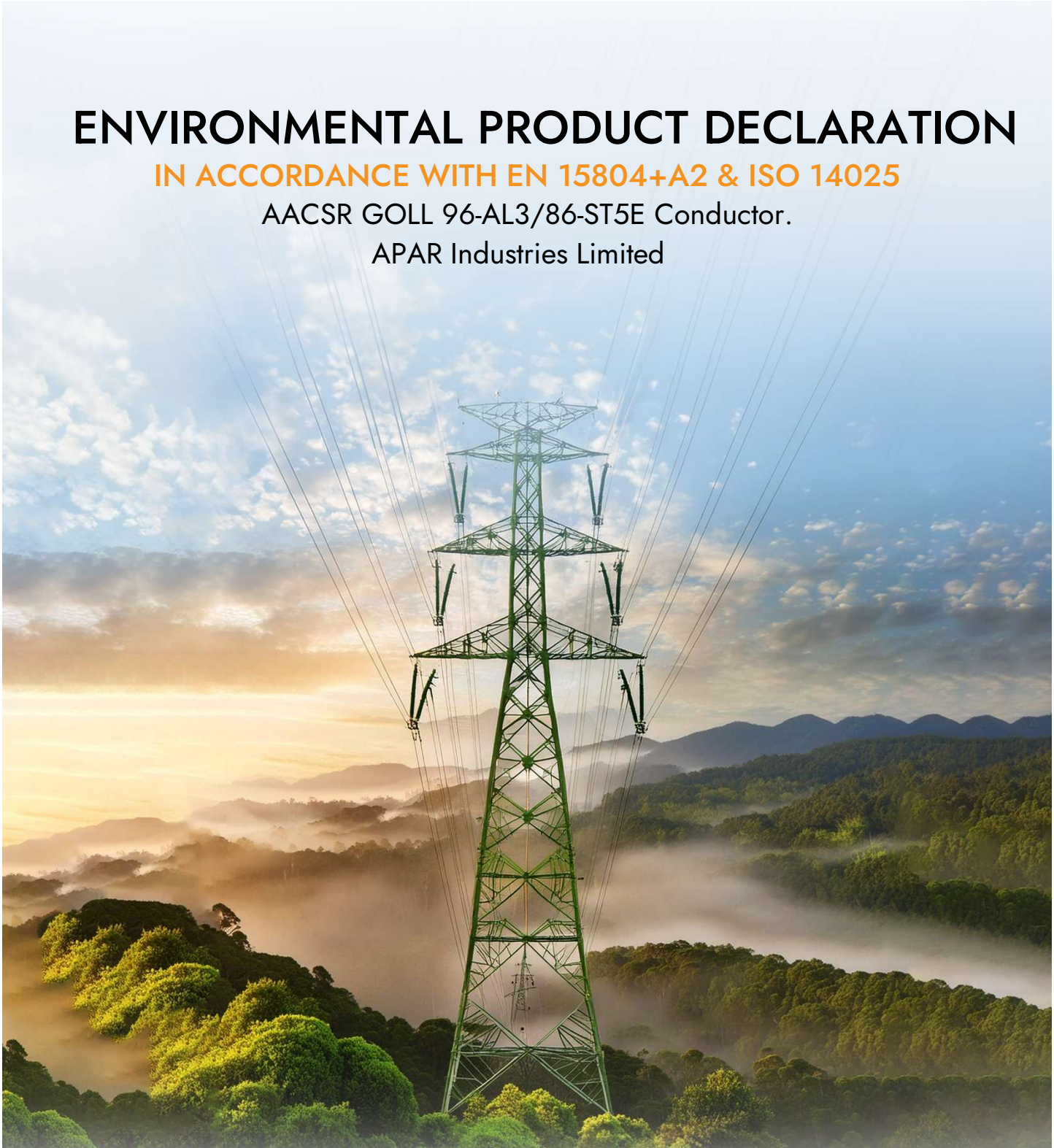
ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

AACSR GOLL 96-AL3/86-ST5E Conductor.

APAR Industries Limited



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EPD HUB, HUB-3797

PPublished on 15.08.2025, last updated on 15.08.2025, valid until 14.08.2030

GENERAL INFORMATION

MANUFACTURER

Manufacturer	APAR Industries Limited
Address	Factory -Unit –III , Survey no. 127/1/2 Village: Athola, Umarkoi Road, Silvassa – 396230, India Registered Office - 301,Panorama Complex, R.C. Dutt Road, Vadodara - 390007, India
Contact Details	epd.info@apar.com
Website	www.apar.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 1.1, 05 Dec 2023
Sector	Electrical 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	Mr. Madanmohan Padhi
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ 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 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	AACSR GOLL Conductor
Additional labels	-
Product reference	WG24C175
Place of production	Silvassa, DNH-396230 India
Period for data	Calendar year Mar 2024 to Mar 2025
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	Not Relevant

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg of AACSR manufactured conductors.
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	4,44E+00
GWP-total, A1-A3 (kgCO2e)	4,45E+00
Secondary material, inputs (%)	12,3
Secondary material, outputs (%)	82,3
Total energy use, A1-A3 (kWh)	16,8
Total water use, A1-A3 (m3e)	0,04

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

APAR Industries was started in 1958, in India. Over 67 years later, we have grown into a diversified billion dollar company, and expanded to over 140 countries as a highly trusted manufacturer and supplier of conductors, a wide variety of cables, specialty oils, polymers and lubricants. At APAR, we have been able to excel at what we do because of who we are: relentless innovators who are constantly pushing ourselves to discover, perfect and deliver tomorrow's solutions today

PRODUCT DESCRIPTION

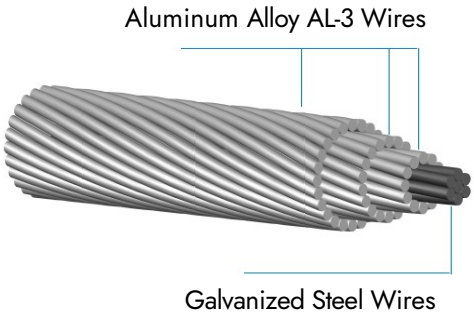

Fig. 1 AACSR Conductor

Aluminum Alloy Conductors Steel reinforced (AACSR): These are concentrically stranded conductor with one or more layers of Aluminum-Magnesium-Silicon alloy wire stranded with a high-strength coated steel core. AACSR Conductor have approx. 40% to 60% more strength than comparable stranded ACSR with only 8 to 10% decrease in conductivity.

Feature:

- Offer optimal strength of line design
- Improved strength to weight ratio.
- Ideal for extra-long span and heavy load conditions
- Excellent resistance to corrosion

Further information can be found at www.apar.com.

DATA SHEET AACSR GOLL Conductor

#	PARTICULARS	UNIT	DATA	
1	Specification according to which the conductor will be manufactured and tested.	-	SS EN 50182	
2	Code Name	-	AACSR GOLL CONDUCTOR (96-AL3/86-ST5E)	
3	Stranding (Aluminum & Steel wires - Number/Diameter)	mm	Alu. Alloy 16/2.77 mm+ St 19/2.40 mm	
4	Nominal O.D. of Conductor	mm	17.5	
5	Nominal Mass of Conductor without grease	Kg/km	941.30	
6	Minimum Rated Strength of Conductor	KN	148.3	
7	Maximum DC resistance of Conductor at 20 deg.C	Ω/Km	0.3462	
8	Lay ratio of Conductor	-	Max	Min
9	(a) 1+6 Steel layer	-	26	16
10	(b) 12 Steel layer	-	22	14
11	(c) 16 Al. Alloy wire layer		14	10
12	Direction of lay for outside layer	-	Right Hand (Z)	
13	Maximum length of conductor	M	3133	

PODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	100%	Asia
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	0
Biogenic carbon content in packaging, kg C	−0,00053

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg of AACSR 703 GOLL Conductor.
Mass per declared unit	1 kg
Functional unit	-
Reference service life	50 Years

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	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse

Modules not declared = MND.

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 conductor is made of aluminum alloy and Galvanized steel wires. The raw materials in the form of aluminum ingots and High tension galvanized steel wire in coil form are transported to company as production facility, where aluminum alloy is drawn into wires to the required dimension, Al drawn wire and steel wires are combined on the wire stranding machine to conduct electricity better. There is no insulation materials present in the product. The manufacturing processes require electricity and fuels for the different equipment as well as heating. Certain ancillary materials are also included. The study considers the losses of main raw materials occurring during the manufacturing process. The finished product is packed in a steel drum and the exposed outer surface of conductor is covered with a polypropylene sheet before being sent to the installation site. The impacts associated with the packaging are also included.

PRODUCT LIFE-CYCLE

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.

Environmental impacts from installation in the construction site (A5) product loss during installation has been assume less than 0.5%.These were not considered in the present life-cycle assessment model, as mentioned in (EN 15804+A2:2019 Chapter 6.3.6, & 6.4.4). Environmental impact from waste packaging materials (A5) and release of biogenic carbon dioxide from waste processing of wood ubet has been included in life-cycle assessment model. Electricity consumption for installation is considered to be 0.0399 MJ of product for stringing the conductors using a crane, puller etc. Average distance of transportation from production plant to building site is 13180 km and the transportation method is lorry and container ship. Vehicle capacity utilization volume factor is assumed to be 100 % which means full load. In reality, it may vary but as role of transportation emissions in total results is small, the variety in load is assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by the transportation company to serve the needs of other clients. Transportation does not cause losses as product are packaged properly. Also, volume capacity utilization factor is assumed to be 100 % for the nested packaged products.

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)

Energy consumption is assumed to be 0.0399 MJ of diesel to be deconstructed. It is assumed that the waste is collected separately and transported to the waste treatment center. Transportation distance to treatment is assumed as 100 km and the transportation method is assumed to be lorry (C2). Module C3 accounts for energy and resource inputs for sorting and treating. . According to World Steel org have consider the steel recycled percentage 85% & according to the International Aluminum Association (2020), approximately 76% of aluminum is recycled globally, which we have used as a conservative assumption in our LCA modeling. However, our product is designed to achieve a recyclability rate of up to 99%. Due to the material and energy recovery potential of aluminum, a part of the end-of-life product is converted into recycled raw materials.

MANUFACTURING PROCESS

Description of system boundaries: Cradle to gate with options, Modules C1–C4, Module D and with optional module A4-A5

A1 to A3

Raw Material supplier

Transportation to APAR

APAR Industries Limited

Coiling

Rolling

Melting & Casting

Aluminium Wire Rod

Wire Drawing

Spool Loading

Conductor Winding

Length Measurement

Conductor Forming

A4-A5

Warehouse

Transportation

Installation

C1 C4 D

Recycling

Waste Process Disposal

Demolition

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	Mass allocation
Packaging materials	Mass allocation
Ancillary materials	Mass allocation
Manufacturing energy and waste	Mass allocation

AVERAGES AND VARIABILITY

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

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, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3
GWP – total[1)]	kg CO_2e	4,01E+00	4,21E-02	4,03E-01	4,45E+00	1,79E-01	7,33E-03	MND	MND	MND
GWP – fossil	kg CO_2e	4,00E+00	4,21E-02	3,99E-01	4,44E+00	1,79E-01	1,14E-02	MND	MND	MND
GWP – biogenic	kg CO_2e	4,51E-03	9,09E-06	4,05E-03	8,58E-03	0,00E+00	-4,05E-03	MND	MND	MND
GWP – LULUC	kg CO_2e	6,81E-03	1,92E-05	6,40E-04	7,46E-03	9,29E-05	2,94E-06	MND	MND	MND
Ozone depletion pot.	kg $CFC_{-11}e$	1,58E-07	6,11E-10	2,17E-09	1,61E-07	2,55E-09	1,43E-10	MND	MND	MND
Acidification potential	mol H^+e	4,62E-02	2,62E-04	1,96E-03	4,84E-02	4,28E-03	7,47E-05	MND	MND	MND
EP-freshwater[2)]	kg Pe	1,65E-03	3,06E-06	3,45E-04	2,00E-03	7,33E-06	3,53E-07	MND	MND	MND
EP-marine	kg Ne	4,36E-03	7,51E-05	4,28E-04	4,87E-03	1,07E-03	3,55E-05	MND	MND	MND
EP-terrestrial	mol Ne	1,54E-01	8,25E-04	4,02E-03	1,59E-01	1,19E-02	3,72E-04	MND	MND	MND
POCP ("smog")[3)]	kg NMVOCe	1,25E-02	2,85E-04	1,25E-03	1,40E-02	3,28E-03	1,13E-04	MND	MND	MND
ADP-minerals & metals[4)]	kg Sbe	9,24E-05	1,15E-07	5,76E-07	9,31E-05	2,60E-07	6,79E-09	MND	MND	MND
ADP-fossil resources	MJ	5,28E+01	5,95E-01	4,94E+00	5,83E+01	2,25E+00	1,22E-01	MND	MND	MND
Water use[5)]	m^3e depr.	1,45E+00	2,77E-03	1,07E-01	1,56E+00	7,24E-03	4,02E-04	MND	MND	MND

Impact category	Unit	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	MND	MND	MND	MND	4,00E-03	1,07E-02	6,41E-02	2,39E-03	-6,27E+00
GWP – fossil	kg CO_2e	MND	MND	MND	MND	4,00E-03	1,07E-02	6,40E-02	2,39E-03	-6,27E+00
GWP – biogenic	kg CO_2e	MND	MND	MND	MND	4,08E-07	4,27E-07	0,00E+00	-5,18E-06	-1,64E-03
GWP – LULUC	kg CO_2e	MND	MND	MND	MND	4,09E-07	4,81E-06	4,95E-05	2,79E-06	-1,55E-03
Ozone depletion pot.	kg $CFC_{-11}e$	MND	MND	MND	MND	6,12E-11	1,59E-10	3,77E-10	5,09E-11	-2,41E-08
Acidification potential	mol H^+e	MND	MND	MND	MND	3,61E-05	3,66E-05	3,59E-04	1,47E-05	-5,21E-02
EP-freshwater[2)]	kg Pe	MND	MND	MND	MND	1,15E-07	8,36E-07	2,14E-05	3,24E-07	-3,02E-03
EP-marine	kg Ne	MND	MND	MND	MND	1,67E-05	1,20E-05	6,45E-05	6,07E-06	-7,32E-03
EP-terrestrial	mol Ne	MND	MND	MND	MND	1,83E-04	1,31E-04	7,24E-04	5,74E-05	-7,51E-02
POCP ("smog")[3)]	kg NMVOCe	MND	MND	MND	MND	5,46E-05	5,40E-05	2,19E-04	1,89E-05	-2,32E-02
ADP-minerals & metals[4)]	kg Sbe	MND	MND	MND	MND	1,43E-09	3,00E-08	2,12E-06	5,67E-09	-1,53E-05
ADP-fossil resources	MJ	MND	MND	MND	MND	5,23E-02	1,56E-01	4,63E-01	4,56E-02	-6,26E+01
Water use[5)]	m^3e depr.	MND	MND	MND	MND	1,31E-04	7,70E-04	9,31E-03	7,54E-04	-8,62E-01

ENVIRONMENTAL IMPACT DATA

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3
Particulate matter	Incidence	5,40E-07	3,66E-09	6,46E-06	7,01E-06	7,13E-09	2,08E-09	MND	MND	MND
Ionizing radiation[6)]	kBq U235e	1,07E-01	4,85E-04	1,46E-02	1,22E-01	1,20E-03	6,53E-05	MND	MND	MND
Ecotoxicity (freshwater)	CTUe	7,01E+01	8,30E-02	2,21E+00	7,24E+01	2,10E-01	1,21E-02	MND	MND	MND
Human toxicity, cancer	CTUh	6,75E-09	7,22E-12	3,48E-10	7,10E-09	3,63E-11	1,22E-12	MND	MND	MND
Human tox. non-cancer	CTUh	8,61E-08	3,59E-10	6,15E-09	9,27E-08	7,48E-10	3,24E-11	MND	MND	MND
SQP[7)]	-	7,90E+00	4,82E-01	2,22E+00	1,06E+01	4,45E-01	3,96E-02	MND	MND	MND

Impact category	Unit	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	MND	MND	MND	MND	1,02E-09	1,08E-09	5,75E-09	2,91E-10	-3,95E-07
Ionizing radiation6)	kBq U235e	MND	MND	MND	MND	2,32E-05	1,36E-04	1,91E-03	7,34E-05	-2,81E-01
Ecotoxicity (freshwater)	CTUe	MND	MND	MND	MND	2,88E-03	2,21E-02	3,03E-01	1,20E+01	-1,56E+01
Human toxicity, cancer	CTUh	MND	MND	MND	MND	4,11E-13	1,77E-12	2,93E-11	1,41E-12	-3,71E-09
Human tox. non-cancer	CTUh	MND	MND	MND	MND	6,50E-12	1,01E-10	1,87E-09	2,77E-10	-4,61E-08
SQP7)	-	MND	MND	MND	MND	3,66E-03	1,57E-01	6,60E-01	7,72E-02	-1,27E+01

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3
Renew. PER as energy[8)]	MJ	1,83E+00	7,81E-03	4,57E-01	2,29E+00	2,04E-02	-1,97E-02	MND	MND	MND
Renew. PER as material	MJ	0,00E+00	0,00E+00	1,68E-02	1,68E-02	0,00E+00	-1,68E-02	MND	MND	MND
Total use of renew. PER	MJ	1,83E+00	7,81E-03	4,74E-01	2,31E+00	2,04E-02	-3,64E-02	MND	MND	MND
Non-re. PER as energy	MJ	5,28E+01	5,95E-01	4,77E+00	5,81E+01	2,25E+00	-9,25E-02	MND	MND	MND
Non-re. PER as material	MJ	0,00E+00	0,00E+00	1,77E-01	1,77E-01	0,00E+00	-1,77E-01	MND	MND	MND
Total use of non-re. PER	MJ	5,28E+01	5,95E-01	4,94E+00	5,83E+01	2,25E+00	-2,69E-01	MND	MND	MND
Secondary materials	kg	1,23E-01	2,60E-04	9,19E-03	1,33E-01	1,06E-03	5,23E-05	MND	MND	MND
Renew. secondary fuels	MJ	6,87E-05	3,02E-06	6,05E-05	1,32E-04	4,78E-06	2,56E-07	MND	MND	MND
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
Use of net fresh water	m^3	3,70E-02	8,10E-05	2,59E-03	3,97E-02	1,87E-04	-2,06E-06	MND	MND	MND

Impact category	Unit	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	MND	MND	MND	MND	3,31E-04	2,14E-03	6,98E-02	1,07E-03	-2,35E+00
Renew. PER as material	MJ	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	MND	MND	MND	MND	3,31E-04	2,14E-03	6,98E-02	1,07E-03	-2,35E+00
Non-re. PER as energy	MJ	MND	MND	MND	MND	5,23E-02	1,56E-01	4,63E-01	4,56E-02	-6,26E+01
Non-re. PER as material	MJ	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,32E-01
Total use of non-re. PER	MJ	MND	MND	MND	MND	5,23E-02	1,56E-01	4,63E-01	4,56E-02	-6,24E+01
Secondary materials	kg	MND	MND	MND	MND	2,17E-05	6,64E-05	4,89E-04	1,57E-05	-1,34E-01
Renew. secondary fuels	MJ	MND	MND	MND	MND	5,67E-08	8,43E-07	1,81E-05	2,47E-07	-2,87E-04
Non-ren. secondary fuels	MJ	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	MND	MND	MND	MND	3,45E-06	2,30E-05	2,54E-04	-2,42E-04	-1,82E-02

ENVIRONMENTAL IMPACT DATA

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3
Hazardous waste	kg	1,02E+00	9,95E-04	6,07E-02	1,08E+00	3,20E-03	1,66E-04	MND	MND	MND
Non-hazardous waste	kg	1,47E+01	1,81E-02	2,57E+00	1,73E+01	4,80E-02	3,04E-02	MND	MND	MND
Radioactive waste	kg	4,97E-05	1,19E-07	4,15E-06	5,40E-05	2,93E-07	1,60E-08	MND	MND	MND

Impact category	Unit	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	MND	MND	MND	MND	5,82E-05	2,64E-04	5,22E-03	2,38E-04	-1,62E+00
Non-hazardous waste	kg	MND	MND	MND	MND	7,93E-04	4,89E-03	1,45E-01	3,72E-01	-1,48E+01
Radioactive waste	kg	MND	MND	MND	MND	5,68E-09	3,32E-08	4,68E-07	1,80E-08	-6,77E-05

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3
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
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,58E-02	MND	MND	MND
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,50E-04	MND	MND	MND
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,70E-03	MND	MND	MND
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,10E-03	MND	MND	MND
Exported energy –Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,60E-03	MND	MND	MND

Impact category	Unit	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	MND	MND	MND	MND	0,00E+00	0,00E+00	8,23E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy –Heat	MJ	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
Global Warming Pot.	kg CO2e	3,99E+00	4,19E-02	4,04E-01	4,44E+00	1,78E-01	1,14E-02	MND	MND	MND
Ozone depletion Pot.	kg CFC-11e	1,38E-07	4,87E-10	2,06E-09	1,40E-07	2,03E-09	1,13E-10	MND	MND	MND
Acidification	kg SO2e	3,03E-02	2,05E-04	1,62E-03	3,21E-02	3,41E-03	5,28E-05	MND	MND	MND
Eutrophication	kg PO43e	6,60E-03	3,55E-05	8,08E-04	7,44E-03	3,87E-04	1,28E-05	MND	MND	MND
POCP ("smog")	kg C2H4e	1,81E-03	1,40E-05	1,46E-04	1,97E-03	1,73E-04	4,13E-06	MND	MND	MND
ADP-elements	kg Sbe	9,19E-05	1,12E-07	5,52E-07	9,26E-05	2,55E-07	6,61E-09	MND	MND	MND
ADP-fossil	MJ	5,16E+01	5,87E-01	4,75E+00	5,69E+01	2,23E+00	1,21E-01	MND	MND	MND

Impact category	Unit	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO2e	MND	MND	MND	MND	3,97E-03	1,07E-02	6,42E-02	2,38E-03	-6,23E+00
Ozone depletion Pot.	kg CFC-11e	MND	MND	MND	MND	4,85E-11	1,27E-10	3,13E-10	4,07E-11	-2,21E-08
Acidification	kg SO2e	MND	MND	MND	MND	2,54E-05	2,80E-05	2,96E-04	1,09E-05	-4,45E-02
Eutrophication	kg PO43e	MND	MND	MND	MND	5,92E-06	6,82E-06	3,73E-05	6,12E-06	-3,65E-03
POCP ("smog")	kg C2H4e	MND	MND	MND	MND	1,90E-06	2,49E-06	1,73E-05	8,91E-07	-3,06E-03
ADP-elements	kg Sbe	MND	MND	MND	MND	1,39E-09	2,92E-08	2,12E-06	5,52E-09	-1,47E-05
ADP-fossil	MJ	MND	MND	MND	MND	5,19E-02	1,54E-01	4,33E-01	4,44E-02	-5,80E+01

ENVIRONMENTAL IMPACTS — GWP - GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3
GWP-GHG[9)]	kg CO_2e	4,00E+00	4,21E-02	3,99E-01	4,44E+00	1,79E-01	1,14E-02	MND	MND	MND

Impact category	Unit	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	MND	MND	MND	MND	4,00E-03	1,07E-02	6,41E-02	2,40E-03	-6,27E+00

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

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.
15.08.2025

VERIFIED ISO 14025