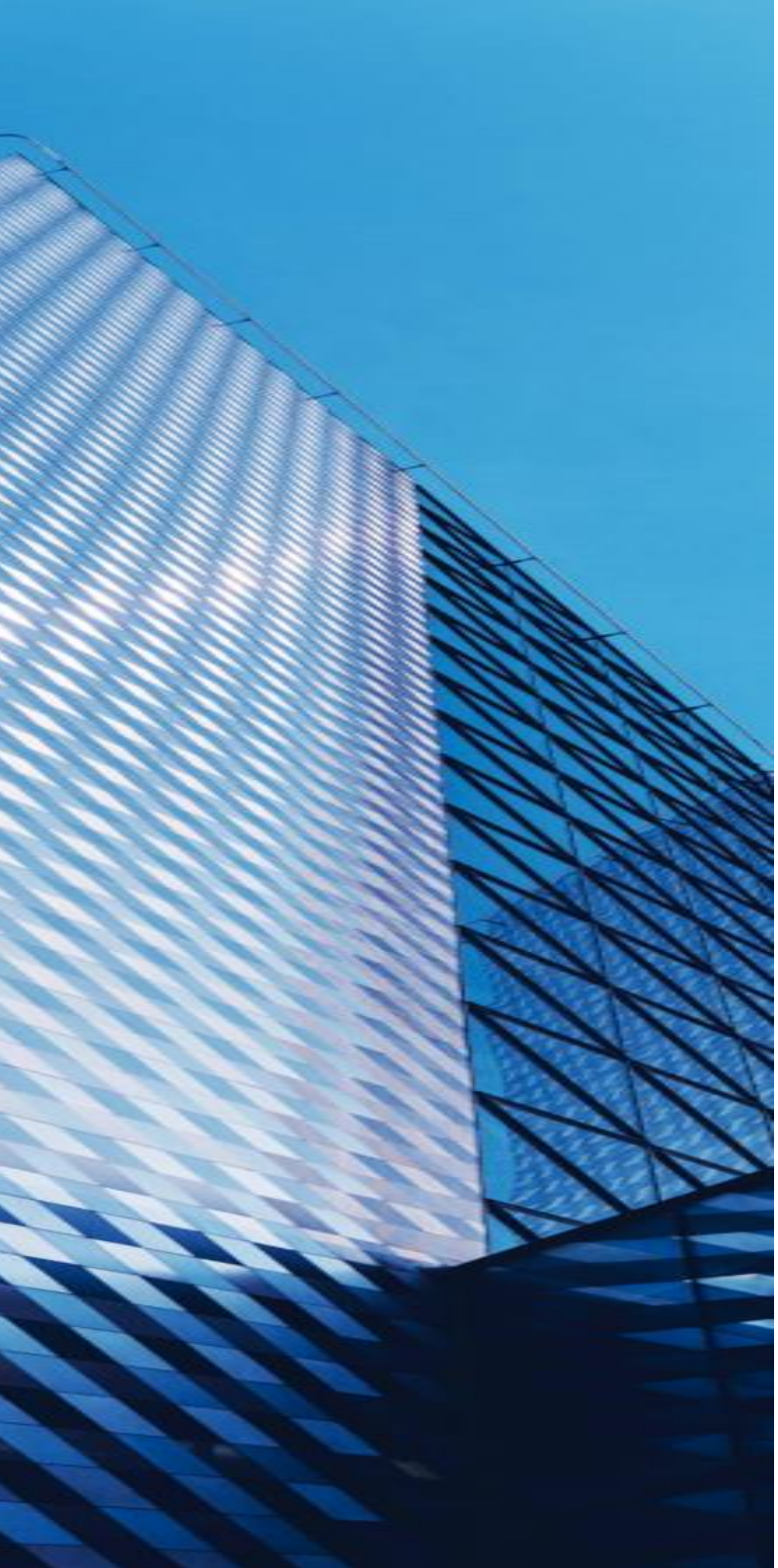
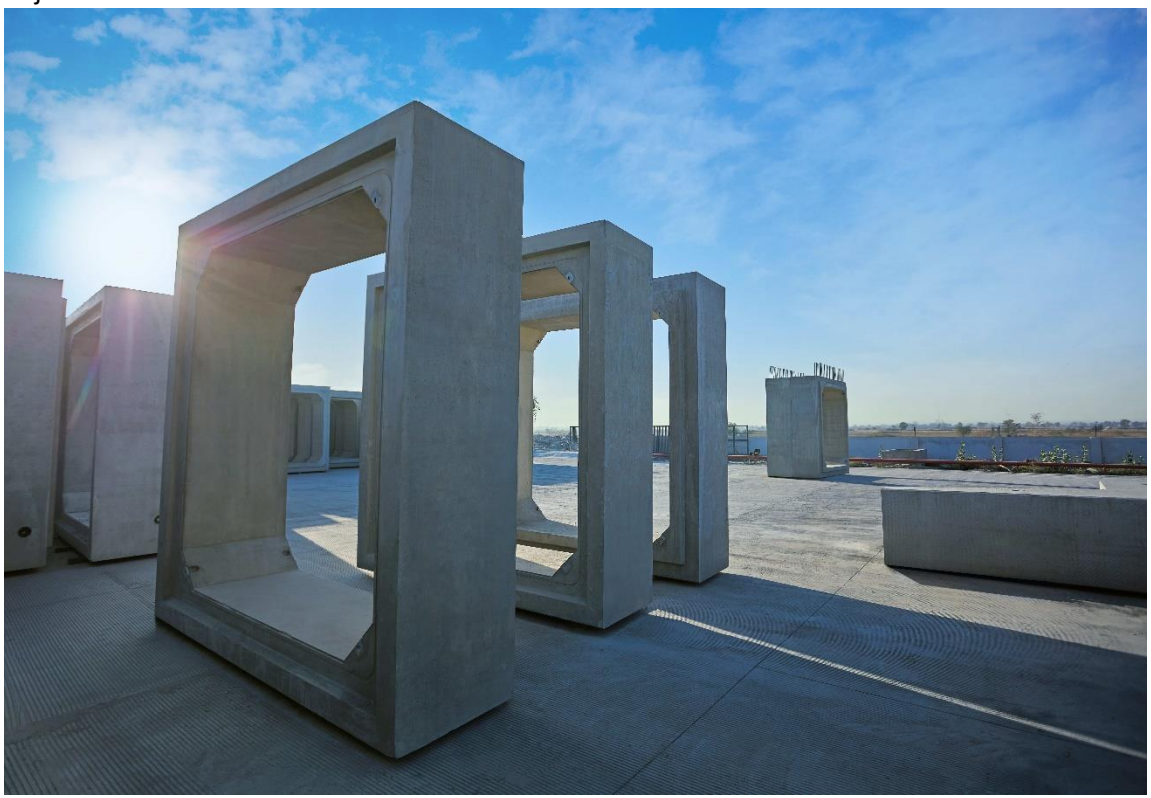


ENVIRONMENTAL PRODUCT DECLARATION

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

Precast Box Culvert
Fuji Silvertech Concrete Private Limited



EPD HUB, HUB-1345
Publishing date 26 April 2024, last updated on 26 April 2024, valid until 26 April 2029.

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Fuji Silvertech Concrete Private Limited
Address	4th Floor, House No. 5, Magnet Corporate Park Ahmedabad, Gujarat, India.
Contact details	anal.sheth@fujisilvertech.com
Website	https://fujisilvertech.com/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	ISO 21930:2017 and ISO 14025
PCR	EPD Hub Core PCR version 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with modules C1-C4, D
EPD author	Parshva Gandhi
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Magaly González Vázquez, 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	Precast Box Culvert
Additional labels	-
Product reference	2000 x 2000 x 2000, 2600 x 2600 x 1500, 3000 x 3000 x 1000
Place of production	Bagodara, Gujarat, India
Period for data	01/08/2022 to 01/08/2023
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	<29 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 Tonne
Declared unit mass	1000 kg
GWP-fossil, A1-A3 (kgCO2e)	2.57E+02
GWP-total, A1-A3 (kgCO2e)	2.57E+02
Secondary material, inputs (%)	0.01
Secondary material, outputs (%)	0
Total energy use, A1-A3 (kWh)	531
Net fresh water use, A1-A3 (m3)	1

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Fuji Silvertech, an Indo-Japan partnership, is India's leading precast solutions provider. It has a unique combination of state-of-the-art technology and a century of experience from its Japanese partner. With India's unwavering commitment to innovation, Fuji Silvertech is ready to revolutionise the infrastructure industry. FUJI Silvertech provides precast solutions for water and sewage, industrial, roads and bridges and railways infrastructures. FUJI Silvertech designs, manufactures, dispatches, and sells precast drains, box culverts, retaining walls, noise barriers etc. pan-India. More information is available on www.fujisilvertech.com.

PRODUCT DESCRIPTION

The product is a precast reinforced concrete factory-made Box Culvert solution. It is intended to be used cross drainage or cable crossing or similar applications such as underpasses, service tunnels, subways, bridges, stream culverts, cattle pass etc. and capable of carrying load as per IRC-6 70R/Class AA as applicable. The product is available in variety of sizes (mm x mm), such as 1200 x 1350, 1200 x 1500, 1200 x 1800, 1500 x 1200, 1500 x 1500, 1500 x 2000, 1800 x 1200, 2000 x 2000 in 2 m long segments and 2600 x 2600 in 1.5 m long segments and 3000 x 3000 in 1.0 m long segment. The EPD report is available for sizes, such as 2000 x 2000 x 2000, 2600 x 2600 x 1500, 3000 x 3000 x 1000. The precast product is manufactured with high performance self-compacting concrete and high strength steel and manufactured with JIS Standards and Indian compliance in a unit certified for ISO 9001:2015, ISO 14001: 2015, ISO 45001:2018 and ZED (Zero effect zero defect).
Further information can be found at https://fujisilvertech.com/

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	5	India
Minerals	95	India
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	-

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 Tonne
Mass per declared unit	1000 kg
Functional unit	-
Reference service life	100 year

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	Deconstr./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 environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production. As such no packaging materials and other ancillary materials are applicable as less then 1 % of such materials by mass are used. Also, fuels used by boilers, machines, handling of product 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 (which are 1% or less) as well as losses during electricity transmission. The precast product is manufacture mainly using Portland cement (available within 250 km), Coarse and Fine aggregate (within 130 km available), Reinforcement (within 600 km available) and water available at manufacturing facility. The production of the precast box culvert by placement of reinforcement in the mould and preparation of concrete mix from its raw materials which are (aggregates, cement, sand, water and admixture). The concrete is then poured in the cleaned mould and allowed to set for few hours. During this time, steam curing is applied for accelerating strength and hardness gain. At the end of the production cycle, the precast product is demoulded and transported to the stockyard. With gain in strength, the product is dispatched from the stockyard to work site as per customer requirement.

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.

This EPD does not cover the transport (A4) and installation (A5) phase.

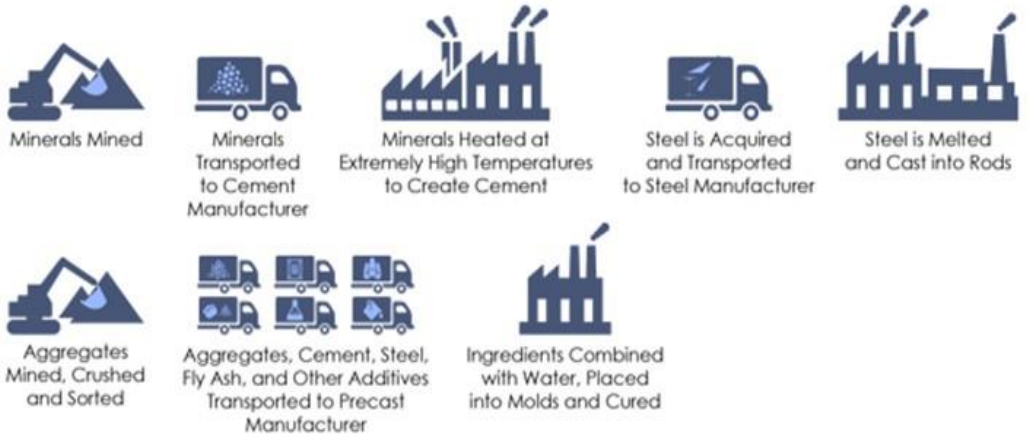
PRODUCT USE AND MAINTENANCE (B1-B7)

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)

At the end-of-life cycle phase, the concrete product remains in the ground and is assumed to be landfilled with concrete as well as scrap steel component. There is no transport and energy consumption in End of life stage.

MANUFACTURING PROCESS



PRECAST CONCRETE PRODUCT 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 or volume
Packaging materials	Not applicable
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	<29 %

The EPD declares three numbers of precast concrete Box Culvert products sizes (2000 x 2000 x 2000, 2600 x 2600 x 1500, 3000 x 3000 x 1000) manufacture in factory of Fuji Silvertech Concrete Pvt. Ltd. at Bagodara, Gujarat, India location.

LCA SOFTWARE AND BIBLIOGRAPHY

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

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	2.41E+02	1.54E+00	1.45E+01	2.57E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	5.27E+00	0.00E+00
GWP – fossil	kg CO_2e	2.41E+02	1.54E+00	1.45E+01	2.57E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	5.27E+00	0.00E+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	MNR	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP – LULUC	kg CO_2e	1.04E-01	5.68E-04	1.34E-03	1.06E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	4.97E-03	0.00E+00
Ozone depletion pot.	kg CFC_{-11}e	6.59E-06	3.54E-07	1.37E-06	8.31E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	2.13E-06	0.00E+00
Acidification potential	mol H^+e	7.23E-01	6.52E-03	5.35E-02	7.83E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	4.95E-02	0.00E+00
EP-freshwater[2)]	kg Pe	2.06E-04	1.26E-05	4.54E-04	6.73E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	5.52E-05	0.00E+00
EP-marine	kg Ne	1.74E-01	1.94E-03	9.55E-03	1.86E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	1.71E-02	0.00E+00
EP-terrestrial	mol Ne	1.99E+00	2.14E-02	1.08E-01	2.12E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	1.89E-01	0.00E+00
POCP ("smog")[3)]	kg NMVOCe	5.13E-01	6.84E-03	3.07E-02	5.50E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	5.48E-02	0.00E+00
ADP-minerals & metals[4)]	kg Sbe	3.80E-05	3.61E-06	7.89E-06	4.95E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	1.21E-05	0.00E+00
ADP-fossil resources	MJ	7.96E+02	2.31E+01	1.85E+02	1.00E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	1.44E+02	0.00E+00
Water use[5)]	m^3e depr.	3.04E+01	1.04E-01	1.27E+00	3.18E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	4.58E-01	0.00E+00

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	7.29E-06	1.78E-07	1.96E-07	7.67E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	9.97E-07	0.00E+00
Ionizing radiation[6)]	kBq U235e	3.90E+00	1.10E-01	6.47E-01	4.66E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	6.53E-01	0.00E+00
Ecotoxicity (freshwater)	CTUe	2.04E+03	2.08E+01	2.51E+02	2.31E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	9.42E+01	0.00E+00
Human toxicity, cancer	CTUh	3.84E-08	5.11E-10	4.33E-09	4.33E-08	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	2.35E-09	0.00E+00
Human tox. non-cancer	CTUh	1.45E-06	2.06E-08	1.26E-07	1.60E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	6.16E-08	0.00E+00
SQP[7)]	-	1.34E+03	2.67E+01	2.46E+01	1.39E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	3.09E+02	0.00E+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	7.90E+01	2.61E-01	6.73E+00	8.60E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	1.25E+00	0.00E+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	MNR	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renew. PER	MJ	7.90E+01	2.61E-01	6.73E+00	8.60E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	1.25E+00	0.00E+00
Non-re. PER as energy	MJ	1.62E+03	2.31E+01	1.85E+02	1.83E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	1.44E+02	0.00E+00
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	MNR	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-re. PER	MJ	1.62E+03	2.31E+01	1.85E+02	1.83E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	1.44E+02	0.00E+00
Secondary materials	kg	6.38E-02	6.42E-03	9.90E-03	8.02E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	3.03E-02	0.00E+00
Renew. secondary fuels	MJ	6.70E-04	6.48E-05	1.05E-04	8.40E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	7.93E-04	0.00E+00
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	MNR	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	9.99E-01	3.00E-03	2.32E-04	1.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	1.58E-01	0.00E+00

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	3.89E+00	3.07E-02	6.14E-01	4.54E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste	kg	1.27E+02	5.04E-01	2.67E+01	1.54E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	1.00E+03	0.00E+00
Radioactive waste	kg	4.49E-03	1.55E-04	8.07E-04	5.45E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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	MNR	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	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	MNR	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	MNR	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	2.13E+02	0.00E+00	1.44E+01	2.27E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	5.16E+00	0.00E+00
Ozone depletion Pot.	kg CFC_{-11}e	8.26E-06	0.00E+00	1.09E-06	9.35E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	1.69E-06	0.00E+00
Acidification	kg SO_2e	6.25E-01	0.00E+00	4.43E-02	6.69E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	3.74E-02	0.00E+00
Eutrophication	kg PO_4^3e	3.31E-01	0.00E+00	1.57E-02	3.46E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	8.07E-03	0.00E+00
POCP (“smog”)	kg C_2H_4e	5.69E-02	0.00E+00	1.73E-03	5.86E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	1.57E-03	0.00E+00
ADP-elements	kg Sbe	1.53E-02	0.00E+00	7.81E-06	1.53E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	1.19E-05	0.00E+00
ADP-fossil	MJ	1.54E+03	0.00E+00	1.85E+02	1.72E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	1.44E+02	0.00E+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

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

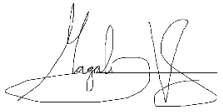
I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried 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.

Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited
26.04.2024



VERIFIED ISO 14025