ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Reinforced concrete pipes - Armerade betongrör

S:t Eriks AB

EPD HUB, HUB-3444
Published on 11.06.2025, last updated on 11.06.2025, valid until 10.06.2030

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.1 (5 Dec 2023) and JRC characterization factors EF 3.1.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	S:t Eriks AB
Address	Industrivägen 4, 245 34 Staffanstorp, Sweden
Contact details	info@steriks.se
Website	https://steriks.se

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 EN 16757 Product Category Rules for concrete and concrete elements
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-B1, and modules C1-C4, D
EPD author	Oscar Ekefäll
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

This EPD is intended for business-to-business and/or business-to-consumer communication. 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	Reinforced concrete pipes - Armerade betongrör
Place of production	Hallsberg, Hjällbo, Karlstad, Kil, Staffanstorp, Trollbo, Vänersborg and Västerås - Sweden
Period for data	Calendar year 2024
Averaging in EPD	Multiple products and multiple factories
Variation in GWP-fossil for A1-A3	0 - 14%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 tonne of reinforced concrete pipe
Declared unit mass	1000 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	1,11E+02
GWP-total, A1-A3 ($kgCO_2e$)	1,11E+02
Secondary material, inputs (%)	5,52
Secondary material, outputs (%)	94,3
Total energy use, A1-A3 (kWh)	373
Net freshwater use, A1-A3 (m^3)	1,55

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

S:t Eriks started its first business, a tile factory, in 1888. Today, we are Sweden's leading supplier of slabs, paving stones, walls, blocks and water and sewage systems made of concrete or natural stone. Over the years, we have contributed materials and knowledge to many large and small projects – from Riksdagshuset, Sergels torg and Förbifart Stockholm to garage driveways, patios and gardens all over the country.

S:t Eriks are certified according to ISO 9001:2015 and ISO 14001:2015.

PRODUCT DESCRIPTION

The finished products are prefabricated concrete pipes with reinforcement that are used in underground water- and sewage systems. The pipes can also be used as culverts to allow water to flow under roads and trails.

The product range includes straight pipes, pipe bends, elbow bends, branch pipes, transition pipes, spigot butt pipes, headwalls and sealing plugs. The pipes are available in different lengths and dimensions.

The products have the same concrete composition regardless of dimension and type. There is a difference in the amount of reinforcement steel, therefor an average value has been used.

Further information can be found at https://steriks.se.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	1,9	EU
Minerals	97,9	EU
Fossil materials	0,2	EU

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	1 tonne of reinforced concrete pipe
Mass per declared unit	1000 kg
Reference service life	100 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	x	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)

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.

Extraction and processing of all raw materials occurring upstream from the manufacturing process, including the energy generation needed for these processes (extraction, refining and transport of energy from primary energy sources) as well as the energy needed for the manufacturing process (A3).

The modelling includes transportation on road and/or water, with processes for each raw material to each of the eight manufacturing sites.

The manufacturing of the reinforced concrete pipes takes place at S:t Eriks' eight sites in Hallsberg, Hjällbo, Karlstad, Kil, Staffanstorp, Trollbo, Vänersborg and Västerås. All raw materials are weighed in by a computer driven process. Gravels and cement are mixed, followed by dosing of water coated cast, equipped with a vibrating core, before the concrete mix is poured into it. After the production cycle is completed, the cast is removed, and the pipe is hardened for 24 hours. Electricity, fuel and water consumption and waste generation are included in this stage. Discarded products are re-used on site or used by local farmers.

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.

The average distance of transportation from production plant to building site is calculated on all customers and the transportation method is lorry. Vehicle capacity utilization is assumed to be 100% which means full load. In reality, it may vary but it is assumed to be negligible.

Empty returns are not considered as the return trip is used by the transportation company to serve the needs of other clients.

Installation includes energy use. No packaging waste is generated due to the lack of packaging. Production loss at installation is assumed negligible as the precast pipes are delivered ready made from the factory. Energy consumption for excavation, installation and refill of soil. Energy consumption is calculated for pipe dimension DN1000 installed 2 meters below the surface. Transport of the excavated materials is not included.

PRODUCT USE AND MAINTENANCE (B1-B7)

Carbon dioxide uptake through carbonisation (CO2) in the use stage is considered in these calculations. Carbonisation is a natural chemical process where part of the carbon dioxide released during the calcination process during cement production is reabsorbed to the concrete when exposed to air. The calculation is made on concrete with a Reference Service Life (RSL) of 100 years and on average material thickness for all pipes. Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

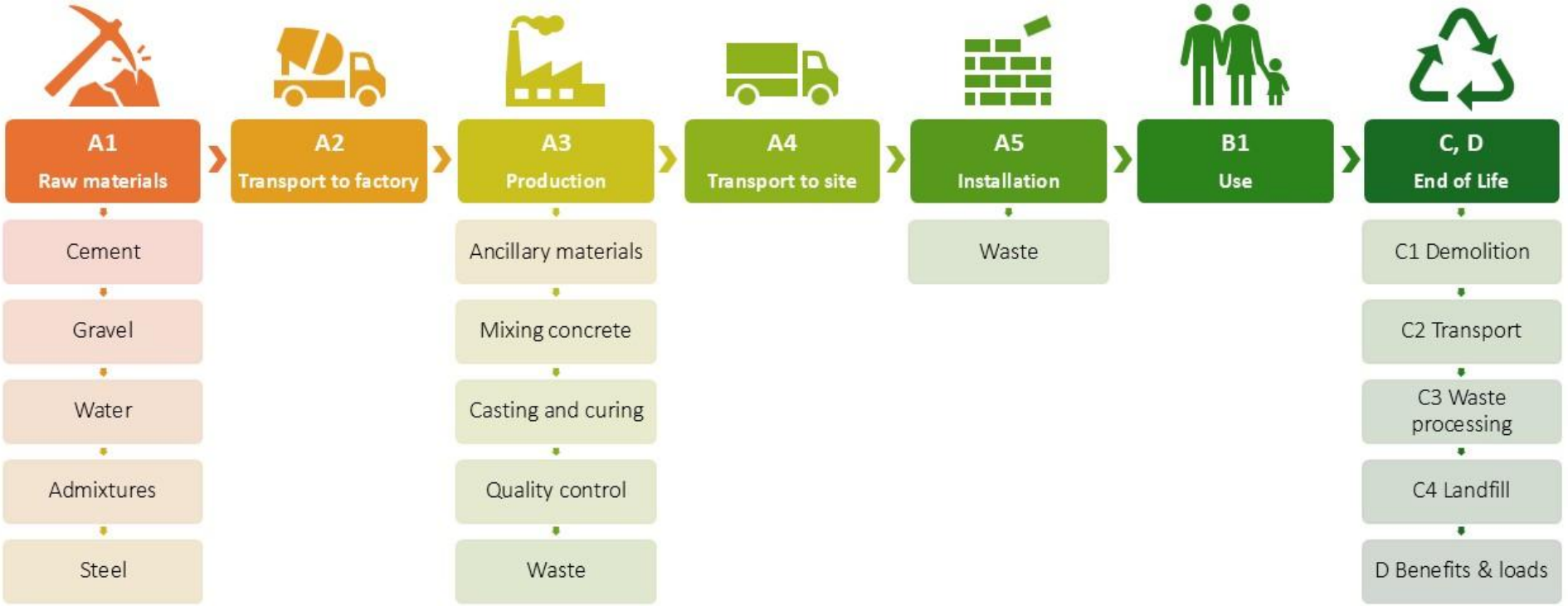
At the end-of-life, in the demolition phase, 100% of the waste is assumed to be collected as separate construction waste. The demolition process consumes energy in the form of diesel fuel used by building machines (C1). Energy consumption is assumed to be the same as in the installation phase.

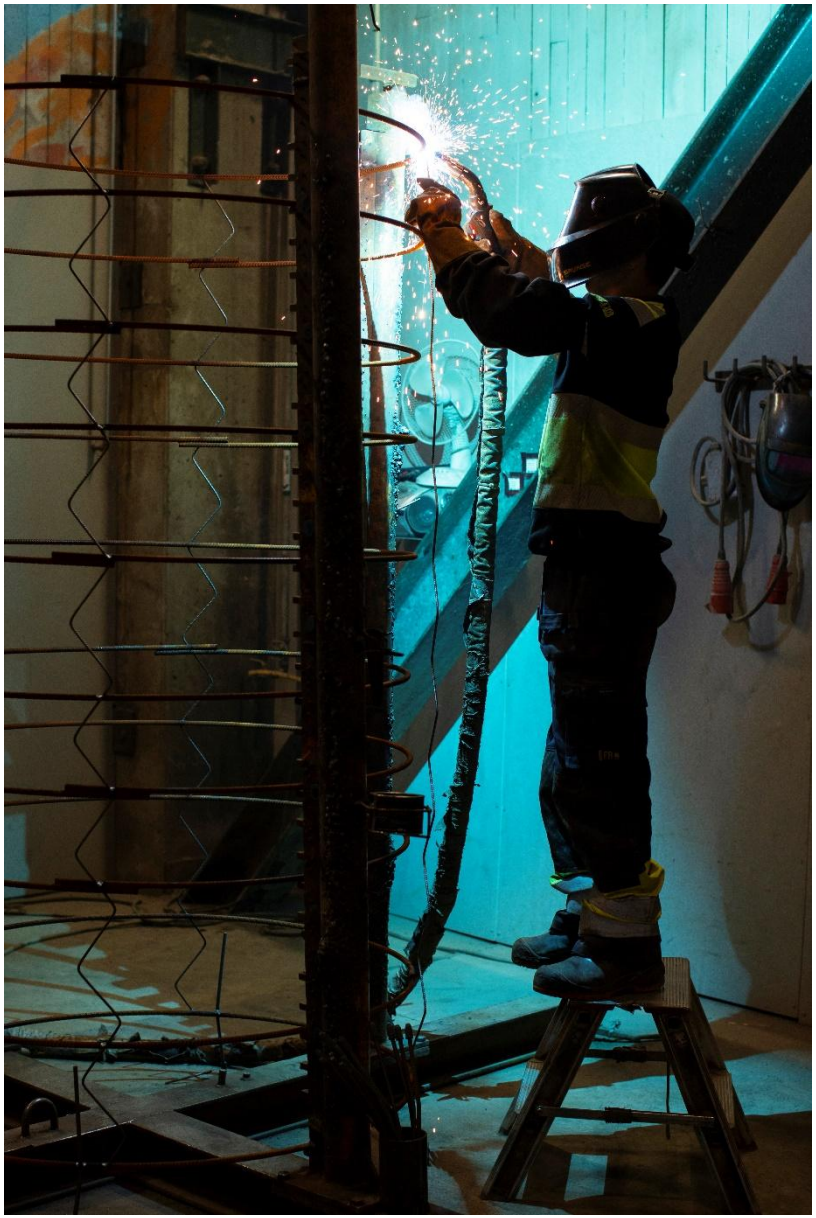
The dismantled concrete pipes are delivered to the nearest construction waste treatment plant. It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed having the same weight as the declared product. Transportation distance to the closest disposal area is estimated as 50 km and the most common transportation method is lorry (C2).

At the waste treatment plant, waste that can be reused, recycled or recovered for energy is separated and diverted for further use. It can be assumed that 100% of the concrete pipes are transported to a waste treatment plant, where the pipes are crushed and separated. 93,6 % of concrete is recycled. The process losses of the waste treatment plant are assumed to be negligible (C3). The remaining 6,4% of concrete are assumed to be sent to the landfill (C4). Source: Mineral waste from construction and demolition, waste treatment, by the European Environment Agency. Published 16 Jan 2020, Modified 20 Sept 2024.

Due to the recycling potential of concrete, it can be crushed and used as secondary raw material, which avoids the use of virgin raw materials. The 93,6 % of concrete going to waste processing is converted into secondary raw materials after recycling. The recycled material content in the concrete itself is assumed to be 4,7 % (D).

MANUFACTURING PROCESS AND SYSTEM BOUNDARY





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 that is 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 made according to 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 material	Not applicable
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

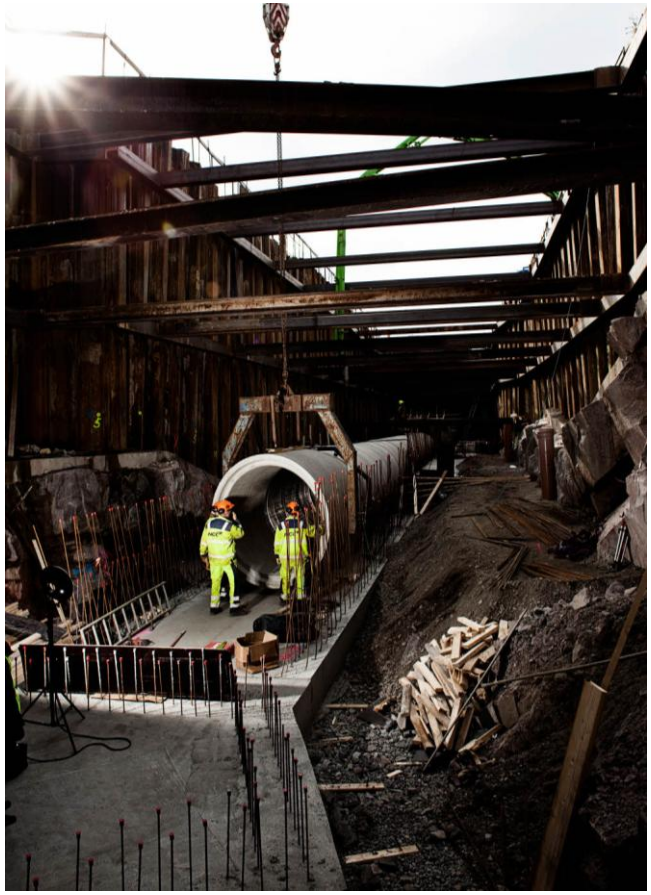
AVERAGES AND VARIABILITY

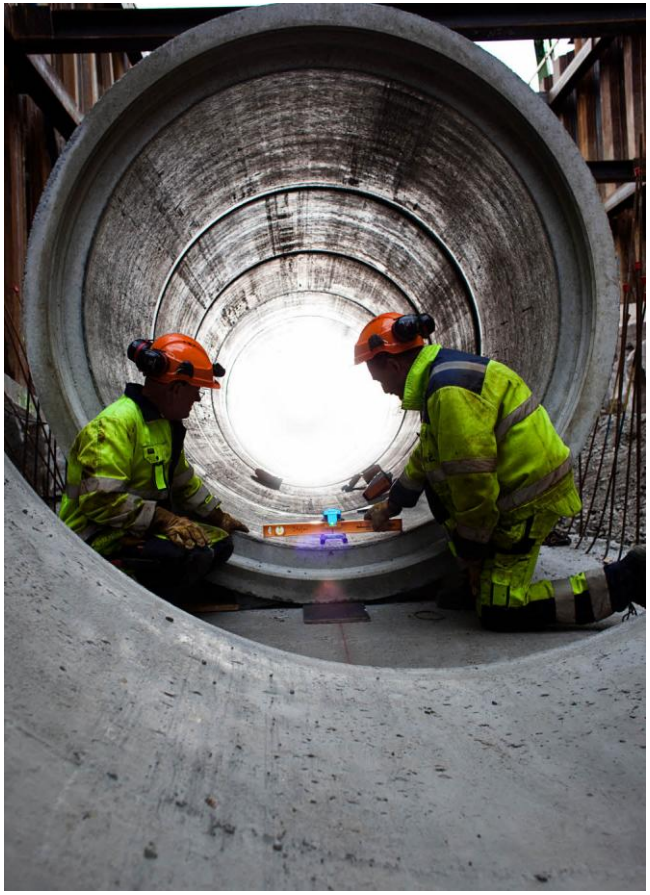
Type of average	Multiple products and multiple factories
Averaging method	Representative product
Variation in GWP-fossil for A1-A3 (%)	0 - 14%

This EPD refers to products with similar recipe from eight different production plants. Reinforced pipes from the site in Hjällbo have been used as a representative product, as they account for the largest share (70%) of the manufactured pipes. 90% of manufactured pipes have roughly the same carbon footprint. The factory in Kil, which accounts for about 10% of the production volume has the highest climate footprint.

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 v3.10.1 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1 environmental data sources follow the methodology ‘allocation, Cut-off, EN 15804+A2‘.





ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2

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	9,21E+01	5,88E+00	1,30E+01	1,11E+02	1,35E+01	1,19E+01	-8,60E+00	MND	MND	MND	MND	MND	MND	1,19E+01	5,21E+00	4,46E+00	4,01E-01	-8,76E+00
GWP – fossil	kg CO_2e	9,21E+01	5,88E+00	1,29E+01	1,11E+02	1,35E+01	1,19E+01	-8,60E+00	MND	MND	MND	MND	MND	MND	1,19E+01	5,21E+00	4,46E+00	4,01E-01	-8,76E+00
GWP – biogenic	kg CO_2e	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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	5,37E-02	2,40E-03	1,26E-01	1,82E-01	5,26E-03	1,22E-03	0,00E+00	MND	MND	MND	MND	MND	MND	1,22E-03	2,03E-03	9,20E-04	2,29E-04	-7,92E-03
Ozone depletion pot.	kg CFC-$_{11}$e	2,24E-06	1,17E-07	2,74E-07	2,63E-06	2,82E-07	1,82E-07	0,00E+00	MND	MND	MND	MND	MND	MND	1,82E-07	1,09E-07	6,75E-08	1,16E-08	-6,82E-08
Acidification potential	mol H^+e	3,13E-01	2,77E-02	5,40E-02	3,95E-01	3,19E-02	1,07E-01	0,00E+00	MND	MND	MND	MND	MND	MND	1,07E-01	1,23E-02	4,14E-02	2,84E-03	-5,35E-02
EP-freshwater[2)]	kg Pe	2,30E-03	3,86E-04	7,13E-04	3,40E-03	9,44E-04	3,43E-04	0,00E+00	MND	MND	MND	MND	MND	MND	3,43E-04	3,64E-04	3,80E-04	3,29E-05	-2,67E-03
EP-marine	kg Ne	1,16E-01	6,65E-03	1,65E-02	1,39E-01	8,36E-03	4,98E-02	0,00E+00	MND	MND	MND	MND	MND	MND	4,98E-02	3,22E-03	1,80E-02	1,08E-03	-1,27E-02
EP-terrestrial	mol Ne	1,29E+00	7,31E-02	1,94E-01	1,56E+00	9,04E-02	5,45E-01	0,00E+00	MND	MND	MND	MND	MND	MND	5,45E-01	3,49E-02	1,98E-01	1,18E-02	-1,53E-01
POCP ("smog")[3)]	kg NMVOCe	3,24E-01	3,16E-02	6,73E-02	4,23E-01	5,54E-02	1,63E-01	0,00E+00	MND	MND	MND	MND	MND	MND	1,63E-01	2,14E-02	5,89E-02	4,24E-03	-4,24E-02
ADP-minerals & metals[4)]	kg Sbe	1,78E-04	1,66E-05	2,64E-05	2,21E-04	3,86E-05	4,27E-06	0,00E+00	MND	MND	MND	MND	MND	MND	4,27E-06	1,49E-05	3,04E-05	6,37E-07	-4,69E-05
ADP-fossil resources	MJ	3,96E+02	8,49E+01	2,99E+02	7,80E+02	2,03E+02	1,56E+02	0,00E+00	MND	MND	MND	MND	MND	MND	1,56E+02	7,82E+01	5,84E+01	9,84E+00	-1,05E+02
Water use[5)]	m^3e depr.	1,02E+04	4,17E-01	8,51E+00	1,02E+04	1,04E+00	3,89E-01	0,00E+00	MND	MND	MND	MND	MND	MND	3,89E-01	4,01E-01	2,31E-01	2,84E-02	-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.

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

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	1,99E-06	4,91E-07	1,05E-06	3,53E-06	1,32E-06	3,05E-06	0,00E+00	MND	MND	MND	MND	MND	MND	3,05E-06	5,08E-07	7,98E-06	6,47E-08	-8,13E-07
Ionizing radiation[6)]	kBq U235e	1,44E+00	9,95E-02	1,03E+01	1,19E+01	2,44E-01	6,89E-02	0,00E+00	MND	MND	MND	MND	MND	MND	6,89E-02	9,43E-02	7,00E-02	6,18E-03	-7,39E-01
Ecotoxicity (freshwater)	CTUe	2,73E+02	1,01E+01	2,11E+01	3,04E+02	2,39E+01	8,57E+00	0,00E+00	MND	MND	MND	MND	MND	MND	8,57E+00	9,22E+00	6,11E+00	8,25E-01	-2,51E+01
Human toxicity, cancer	CTUh	1,01E-08	1,02E-09	3,95E-09	1,51E-08	2,25E-09	1,22E-09	0,00E+00	MND	MND	MND	MND	MND	MND	1,22E-09	8,68E-10	7,81E-10	7,39E-11	-2,34E-09
Human tox. non-cancer	CTUh	1,55E-07	5,17E-08	6,39E-08	2,70E-07	1,31E-07	1,94E-08	0,00E+00	MND	MND	MND	MND	MND	MND	1,94E-08	5,06E-08	3,14E-08	1,70E-09	-6,83E-08
SQP[7)]	-	8,63E+02	6,90E+01	8,45E+01	1,02E+03	2,04E+02	1,09E+01	0,00E+00	MND	MND	MND	MND	MND	MND	1,09E+01	7,87E+01	1,44E+01	1,94E+01	-9,84E+01

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	1,32E+02	1,36E+00	1,05E+02	2,38E+02	3,30E+00	9,86E-01	0,00E+00	MND	MND	MND	MND	MND	MND	9,86E-01	1,27E+00	1,36E+00	9,49E-02	-9,57E+00
Renew. PER as material	MJ	1,14E-01	0,00E+00	-5,68E-04	1,14E-01	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-1,06E-01	-7,27E-03	0,00E+00
Total use of renew. PER	MJ	1,32E+02	1,36E+00	1,05E+02	2,38E+02	3,30E+00	9,86E-01	0,00E+00	MND	MND	MND	MND	MND	MND	9,86E-01	1,27E+00	1,25E+00	8,77E-02	-9,57E+00
Non-re. PER as energy	MJ	3,89E+02	8,49E+01	2,95E+02	7,69E+02	2,03E+02	1,56E+02	0,00E+00	MND	MND	MND	MND	MND	MND	1,56E+02	7,82E+01	5,84E+01	9,84E+00	-1,05E+02
Non-re. PER as material	MJ	8,33E+00	0,00E+00	-4,14E-02	8,29E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-7,76E+00	-5,30E-01	0,00E+00
Total use of non-re. PER	MJ	3,97E+02	8,49E+01	2,95E+02	7,77E+02	2,03E+02	1,56E+02	0,00E+00	MND	MND	MND	MND	MND	MND	1,56E+02	7,82E+01	5,07E+01	9,31E+00	-1,05E+02
Secondary materials	kg	5,52E+01	3,85E-02	4,52E-02	5,53E+01	8,77E-02	6,46E-02	0,00E+00	MND	MND	MND	MND	MND	MND	6,46E-02	3,38E-02	2,87E-02	2,47E-03	-1,17E-01
Renew. secondary fuels	MJ	4,75E+01	4,42E-04	3,32E-04	4,75E+01	1,11E-03	1,69E-04	0,00E+00	MND	MND	MND	MND	MND	MND	1,69E-04	4,27E-04	3,69E-04	5,12E-05	-8,09E-04
Non-ren. secondary fuels	MJ	2,89E+02	0,00E+00	0,00E+00	2,89E+02	0,00E+00	0,00E+00	0,00E+00	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	1,34E+00	1,17E-02	1,93E-01	1,55E+00	2,99E-02	1,03E-02	0,00E+00	MND	MND	MND	MND	MND	MND	1,03E-02	1,15E-02	6,41E-03	1,02E-02	-3,12E-01

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	5,36E-01	1,24E-01	2,14E-01	8,73E-01	2,94E-01	1,73E-01	0,00E+00	MND	MND	MND	MND	MND	MND	1,73E-01	1,13E-01	9,48E-02	1,09E-02	-8,20E-01
Non-hazardous waste	kg	1,65E+01	2,44E+00	2,06E+01	3,95E+01	5,87E+00	2,36E+00	0,00E+00	MND	MND	MND	MND	MND	MND	2,36E+00	2,27E+00	2,10E+00	2,48E-01	-1,46E+01
Radioactive waste	kg	5,31E-03	2,46E-05	2,22E-03	7,56E-03	6,05E-05	1,69E-05	0,00E+00	MND	MND	MND	MND	MND	MND	1,69E-05	2,33E-05	1,77E-05	1,51E-06	-1,78E-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	5,00E+00	5,00E+00	0,00E+00	0,00E+00	0,00E+00	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	3,53E+00	0,00E+00	1,00E-01	3,63E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	9,43E+02	0,00E+00	0,00E+00
Materials for energy rec	kg	2,16E-02	0,00E+00	0,00E+00	2,16E-02	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	7,76E-04	0,00E+00	0,00E+00	7,76E-04	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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	9,63E+01	5,84E+00	1,31E+01	1,15E+02	1,34E+01	1,18E+01	-8,60E+00	MND	MND	MND	MND	MND	MND	1,18E+01	5,17E+00	4,43E+00	3,97E-01	-8,71E+00
Ozone depletion Pot.	kg $CFC_{-11}e$	4,82E-07	9,30E-08	2,18E-07	7,94E-07	2,24E-07	1,44E-07	0,00E+00	MND	MND	MND	MND	MND	MND	1,44E-07	8,65E-08	5,36E-08	9,22E-09	-5,76E-08
Acidification	kg SO_2e	2,50E-01	2,22E-02	4,03E-02	3,13E-01	2,53E-02	7,55E-02	0,00E+00	MND	MND	MND	MND	MND	MND	7,55E-02	9,75E-03	2,96E-02	2,10E-03	-4,15E-02
Eutrophication	kg PO_4^3e	3,78E-02	3,67E-03	8,07E-03	4,96E-02	6,31E-03	1,76E-02	0,00E+00	MND	MND	MND	MND	MND	MND	1,76E-02	2,43E-03	6,57E-03	6,68E-04	-8,06E-03
POCP (“smog”)	kg C_2H_4e	1,67E-02	1,61E-03	3,15E-03	2,15E-02	2,58E-03	5,66E-03	0,00E+00	MND	MND	MND	MND	MND	MND	5,66E-03	9,94E-04	2,16E-03	1,99E-04	-3,66E-03
ADP-elements	kg Sbe	1,91E-04	1,62E-05	2,64E-05	2,34E-04	3,77E-05	4,15E-06	0,00E+00	MND	MND	MND	MND	MND	MND	4,15E-06	1,45E-05	3,03E-05	6,24E-07	-4,61E-05
ADP-fossil	MJ	5,46E+02	8,33E+01	1,62E+02	7,91E+02	1,99E+02	1,55E+02	0,00E+00	MND	MND	MND	MND	MND	MND	1,55E+02	7,67E+01	5,73E+01	9,74E+00	-9,34E+01

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

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	9,21E+01	5,88E+00	1,30E+01	1,11E+02	1,35E+01	1,19E+01	-8,60E+00	MND	MND	MND	MND	MND	MND	1,19E+01	5,21E+00	4,46E+00	4,01E-01	-8,76E+00

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 characterisation factors for the flows - CH4 fossil, CH4 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 CO2 is set to zero.

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
11.06.2025

VERIFIED ISO 14025