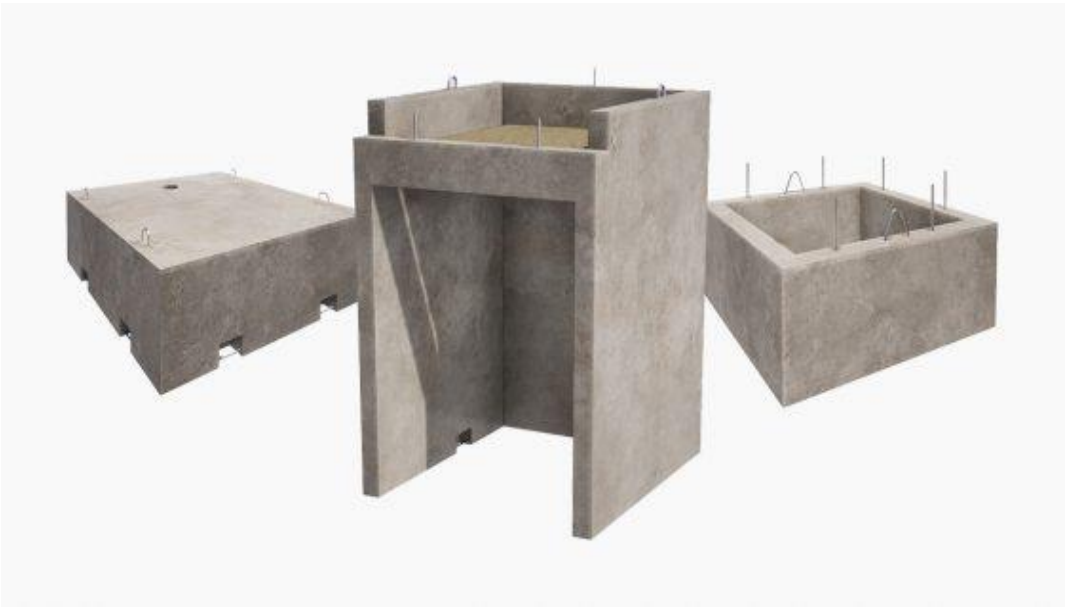
ENVIRONMENTAL PRODUCT DECLARATION

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

Consolis Parma low carbon elevator shaft
Parma Oy



EPD HUB, HUB-0285
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Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Parma Oy
Address	Hiidenmäentie 20, 03100 Nummela, Finland
Contact details	maarit.julku@consolis.com
Website	https://parma.fi/

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	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4, and modules C1-C4, D
EPD author	Maarit Julku
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	E.A 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	Consolis Parma low carbon elevator shaft
Additional labels	CE EN 1168:2005+A3:2011, FI TR 15:2017
Product reference	GHKU
Place of production	Kotka, Finland
Period for data	2021
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 tonne
Declared unit mass	1000 kg
GWP-fossil, A1-A3 (kgCO2e)	8,38E1
GWP-total, A1-A3 (kgCO2e)	8,49E1
Secondary material, inputs (%)	5.48
Secondary material, outputs (%)	99.0
Total energy use, A1-A3 (kWh)	269.0
Total water use, A1-A3 (m3e)	3.13

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Consolis Parma (Parma Oy) is Finland's largest precast concrete manufacturer. Parma Oy is a close partner of construction professionals and a reliable element supplier for small house builders. Parma focuses on providing solutions and products for construction projects where Parma is leading player in the industry. Parma Oy belongs to the international Consolis group and employs more than 650 people.

PRODUCT DESCRIPTION

The product is a prefabricated concrete elevator shaft. The elevator shaft consists of a shaft element (GHKU), a lower cup (GHA) and an upper cup (GHY). A constant thickness is 770 mm and density 2 500 kg/m^3.

Further information can be found at https://parma.fi/.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	4	Europe
Minerals	96	Finland
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

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 tonne
Mass per declared unit	1000 kg
Functional unit	-
Reference service life	-

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	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 production of the elevator shafts is proceeded in standard steel moulds of different sizes with some flexibility in element height. The moulds are cleaned before the external mould is assembled. At the same time, the reinforcement is prepared by bending and cutting meshes and bars into the designed dimensions. After reinforcement and cast-in-materials are mounted, the form oil is applied and the element is casted. After casting and finishing, the element is left to cure. The element is removed when the casting is cured. Finally, the element is finished and transported to the storage area for quality control.

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 product is loaded onto lorries for transport to the construction site. The transports are optimised for both efficient assembling at the construction site and reducing the number of required vehicles. Transportation does not cause losses as the product is attached to the lorry properly. The transportation distance is defined according to RTS PCR. The average distance of transportation from production plant to construction site is assumed as 113 km. The transportation method is assumed to be a lorry.

Optional A5 module is not declared.

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.

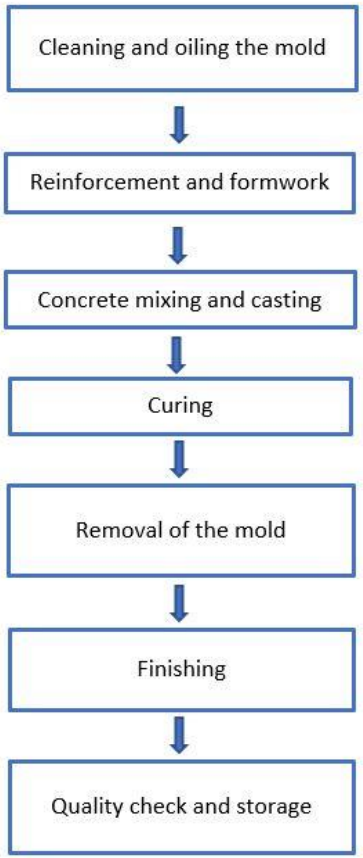
PRODUCT END OF LIFE (C1-C4, D)

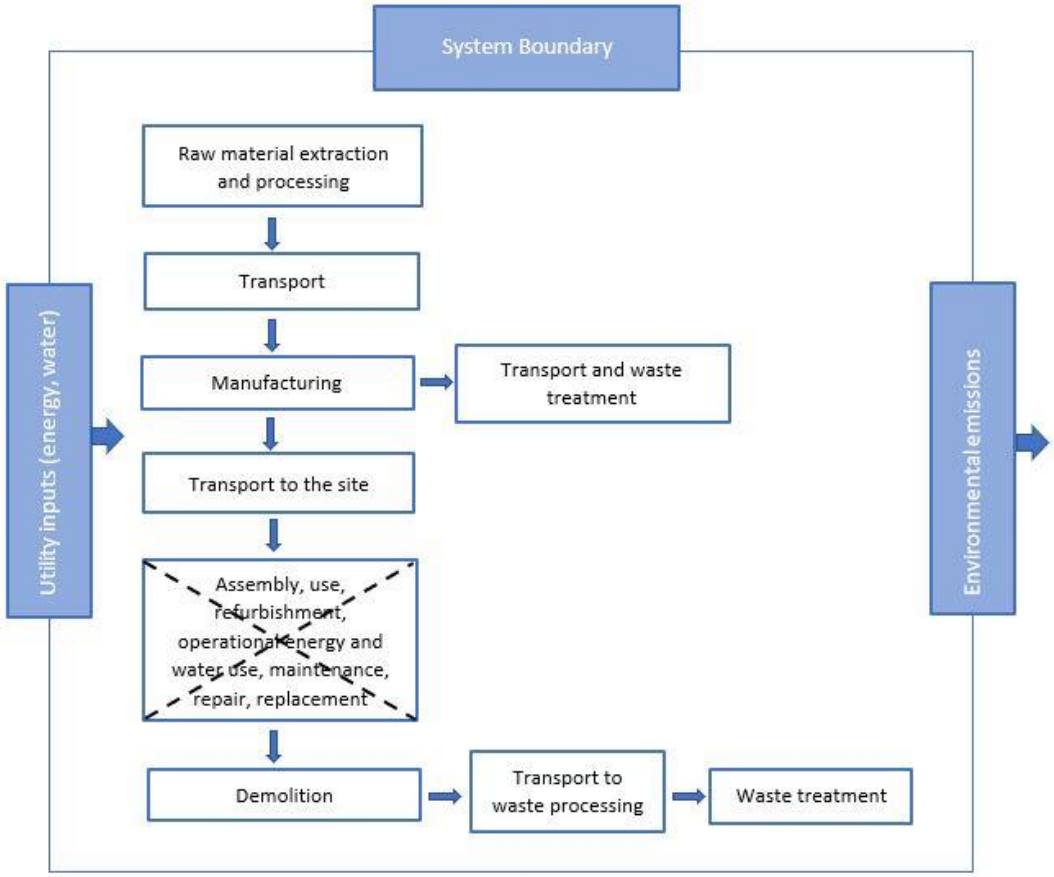
At the end-of-life cycle phase, the concrete product is dismantled. In the demolition phase 100 % of the waste is assumed to be collected as separate construction waste. The demolition process consumes energy in the form of diesel fuel used by building machines (C1). The dismantled solid slab is delivered to the nearest construction waste treatment plant (C2). The average distance to the nearest construction waste treatment plant is assumed as 50 km. At the waste treatment plant, waste that can

be reused, recycled or recovered for energy is separated and diverted for further use (C3). It is assumed that 99 % of concrete and 99 % of steel is recycled. The recycled content is based on collected information (Federation of the European Precast Concrete Industry BIBM, The Little Green Book of Concrete, 2021). Unusable materials are disposed in a landfill (C4). It is assumed that 1 % of concrete and 1 % of steel is disposed in a landfill. Due to the recycling potential of reinforcement steel and concrete, they can be used as secondary raw materials. This avoids the use of the virgin raw materials (D).

MANUFACTURING PROCESS

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	No allocation
Packaging materials	No allocation
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

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

This EPD is product and factory specific and does not contain average calculations.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent 3.6 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	7,6E1	4,46E0	4,42E0	8,49E1	9,75E0	0E0	MND	MND	MND	MND	MND	MND	MND	3,3E0	4,36E0	4,67E0	5,28E-2	-3,8E0
GWP – fossil	kg CO_2e	7,5E1	4,46E0	4,36E0	8,38E1	9,84E0	0E0	MND	MND	MND	MND	MND	MND	MND	3,3E0	4,35E0	4,72E0	5,27E-2	-3,74E0
GWP – biogenic	kg CO_2e	9,59E-1	3,38E-3	3,2E-2	9,94E-1	7,46E-3	0E0	MND	MND	MND	MND	MND	MND	MND	9,17E-4	3,3E-3	-5,08E-2	1,04E-4	-5,44E-2
GWP – LULUC	kg CO_2e	4,95E-2	1,4E-3	2,64E-2	7,73E-2	3,09E-3	0E0	MND	MND	MND	MND	MND	MND	MND	2,79E-4	1,37E-3	1,35E-3	1,56E-5	-6,17E-3
Ozone depletion pot.	kg $CFC_{-11}e$	2,67E-6	1,09E-6	7,42E-7	4,51E-6	2,42E-6	0E0	MND	MND	MND	MND	MND	MND	MND	7,12E-7	1,07E-6	9,54E-7	2,17E-8	-4,74E-7
Acidification potential	mol H^+e	2,89E-1	1,45E-2	1,36E-2	3,17E-1	3,17E-2	0E0	MND	MND	MND	MND	MND	MND	MND	3,45E-2	1,4E-2	5,09E-2	5E-4	-1,87E-2
EP-freshwater[2)]	kg Pe	5,64E-3	3,78E-5	1,22E-4	5,8E-3	8,36E-5	0E0	MND	MND	MND	MND	MND	MND	MND	1,33E-5	3,7E-5	7,79E-5	6,36E-7	-4,49E-5
EP-marine	kg Ne	5,61E-2	3,19E-3	2,51E-3	6,18E-2	6,96E-3	0E0	MND	MND	MND	MND	MND	MND	MND	1,52E-2	3,08E-3	2E-2	1,72E-4	-4,51E-3
EP-terrestrial	mol Ne	9,97E-1	3,55E-2	2,91E-2	1,06E0	7,74E-2	0E0	MND	MND	MND	MND	MND	MND	MND	1,67E-1	3,43E-2	2,21E-1	1,9E-3	-6,28E-2
POCP ("smog")[3)]	kg NMVOCe	2,54E-1	1,39E-2	1,02E-2	2,78E-1	3,04E-2	0E0	MND	MND	MND	MND	MND	MND	MND	4,59E-2	1,34E-2	6,08E-2	5,51E-4	-1,6E-2
ADP-minerals & metals[4)]	kg Sbe	6,96E-4	7,94E-5	1,73E-5	7,92E-4	1,75E-4	0E0	MND	MND	MND	MND	MND	MND	MND	5,03E-6	7,75E-5	5,6E-5	4,81E-7	-5,41E-4
ADP-fossil resources	MJ	4,5E2	7,24E1	1,06E2	6,28E2	1,6E2	0E0	MND	MND	MND	MND	MND	MND	MND	4,54E1	7,07E1	6,5E1	1,47E0	-6,54E1
Water use[5)]	m^3e depr.	4,23E1	2,69E-1	-3,07E-1	4,23E1	5,94E-1	0E0	MND	MND	MND	MND	MND	MND	MND	8,46E-2	2,63E-1	2,76E-1	6,81E-2	-7,65E0

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

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1,83E-6	3,91E-7	7,95E-8	2,3E-6	8,64E-7	0E0	MND	MND	MND	MND	MND	MND	MND	9,14E-7	3,82E-7	4,98E-6	9,72E-9	-2,17E-7
Ionizing radiation[6)]	kBq U235e	2,7E3	3,17E-1	1,81E0	2,7E3	6,99E-1	0E0	MND	MND	MND	MND	MND	MND	MND	1,94E-1	3,09E-1	2,87E-1	6,04E-3	-5,52E-1
Ecotoxicity (freshwater)	CTUe	6,04E2	5,53E1	4,93E1	7,09E2	1,22E2	0E0	MND	MND	MND	MND	MND	MND	MND	2,66E1	5,4E1	8,42E1	9,29E-1	3,23E2
Human toxicity, cancer	CTUh	1,61E-7	1,39E-9	1,09E-9	1,63E-7	3,08E-9	0E0	MND	MND	MND	MND	MND	MND	MND	9,53E-10	1,36E-9	2,42E-9	2,2E-11	6,64E-8
Human tox. non-cancer	CTUh	2,22E-6	6,31E-8	2,68E-8	2,31E-6	1,39E-7	0E0	MND	MND	MND	MND	MND	MND	MND	2,35E-8	6,17E-8	8,97E-8	6,79E-10	-1,83E-8
SQP[7)]	-	3,21E2	1,09E2	2,86E0	4,33E2	2,41E2	0E0	MND	MND	MND	MND	MND	MND	MND	1,16E0	1,07E2	4,47E0	2,5E0	-5,49E1

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	1,98E2	9,11E-1	2,27E1	2,22E2	2,01E0	0E0	MND	MND	MND	MND	MND	MND	MND	2,45E-1	8,9E-1	2,25E0	1,19E-2	3,73E0
Renew. PER as material	MJ	4,6E-1	0E0	0E0	4,6E-1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	1,99E2	9,11E-1	2,27E1	2,22E2	2,01E0	0E0	MND	MND	MND	MND	MND	MND	MND	2,45E-1	8,9E-1	2,25E0	1,19E-2	3,73E0
Non-re. PER as energy	MJ	4,76E2	7,24E1	1,06E2	6,55E2	1,6E2	0E0	MND	MND	MND	MND	MND	MND	MND	4,54E1	7,07E1	6,5E1	1,47E0	-6,54E1
Non-re. PER as material	MJ	1,73E1	0E0	0E0	1,73E1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	4,94E2	7,24E1	1,06E2	6,72E2	1,6E2	0E0	MND	MND	MND	MND	MND	MND	MND	4,54E1	7,07E1	6,5E1	1,47E0	-6,54E1
Secondary materials	kg	5,48E1	0E0	1,02E-3	5,48E1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	-6,16E-1
Renew. secondary fuels	MJ	3,19E1	0E0	0E0	3,19E1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	5,85E1	0E0	0E0	5,85E1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m^3	3,09E0	1,51E-2	2,66E-2	3.13	3,33E-2	0E0	MND	MND	MND	MND	MND	MND	MND	4,01E-3	1,47E-2	9,76E-3	1,61E-3	-9,84E-1

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	7,73E-1	7,03E-2	1,78E-1	1,02E0	1,55E-1	0E0	MND	MND	MND	MND	MND	MND	MND	4,88E-2	6,87E-2	0E0	1,37E-3	3,58E0
Non-hazardous waste	kg	4,6E1	7,77E0	4,52E0	5,83E1	1,72E1	0E0	MND	MND	MND	MND	MND	MND	MND	5,22E-1	7,6E0	0E0	1E1	9,34E0
Radioactive waste	kg	6,71E-3	4,97E-4	7,93E-4	8E-3	1,1E-3	0E0	MND	MND	MND	MND	MND	MND	MND	3,18E-4	4,86E-4	0E0	9,74E-6	-3,89E-4

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	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	6,8E0	0E0	0E0	6,8E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	9,9E2	0E0	0E0
Materials for energy rec	kg	4,1E-2	0E0	0E0	4,1E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	1,8E0	0E0	0E0	1,8E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0

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

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1,34E1	4,42E0	4,23E0	2,2E1	9,75E0	0E0	MND	MND	MND	MND	MND	MND	MND	3,27E0	4,32E0	4,68E0	5,17E-2	-3,7E0
Ozone depletion Pot.	kg $CFC_{-11}e$	1,51E-6	8,7E-7	7,56E-7	3,14E-6	1,92E-6	0E0	MND	MND	MND	MND	MND	MND	MND	5,63E-7	8,5E-7	7,62E-7	1,72E-8	-4,43E-7
Acidification	kg SO_2e	1,32E-1	9,58E-3	1,11E-2	1,53E-1	2,09E-2	0E0	MND	MND	MND	MND	MND	MND	MND	4,87E-3	9,25E-3	1,25E-2	2,08E-4	-4,19E-3
Eutrophication	kg PO_4^3e	2,43E-2	1,92E-3	3,85E-3	3,01E-2	4,22E-3	0E0	MND	MND	MND	MND	MND	MND	MND	8,57E-4	1,87E-3	3,78E-3	4,03E-5	5,35E-3
POCP (“smog”)	kg C_2H_4e	4,63E-3	5,48E-4	5,4E-4	5,71E-3	1,2E-3	0E0	MND	MND	MND	MND	MND	MND	MND	5,01E-4	5,32E-4	9E-4	1,53E-5	-1,48E-3
ADP-elements	kg Sbe	6,96E-4	7,94E-5	1,73E-5	7,92E-4	1,75E-4	0E0	MND	MND	MND	MND	MND	MND	MND	5,03E-6	7,75E-5	5,6E-5	4,81E-7	-5,41E-4
ADP-fossil	MJ	4,5E2	7,24E1	1,06E2	6,28E2	1,6E2	0E0	MND	MND	MND	MND	MND	MND	MND	4,54E1	7,07E1	6,5E1	1,47E0	-6,54E1

ENVIRONMENTAL IMPACTS – TRACI 2.1. / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1,34E1	4,41E0	4,25E0	2,2E1	9,74E0	0E0	MND	MND	MND	MND	MND	MND	MND	3,26E0	4,31E0	4,66E0	5,14E-2	-3,65E0
Ozone Depletion	kg CFC_{-11}e	1,8E-6	1,16E-6	9,71E-7	3,93E-6	2,56E-6	0E0	MND	MND	MND	MND	MND	MND	MND	7,51E-7	1,13E-6	1,01E-6	2,29E-8	-5,83E-7
Acidification	kg SO_2e	1,36E-1	1,22E-2	1,14E-2	1,6E-1	2,67E-2	0E0	MND	MND	MND	MND	MND	MND	MND	3,16E-2	1,18E-2	4,58E-2	4,43E-4	-1,59E-2
Eutrophication	kg Ne	8,03E-3	2,09E-3	1,37E-3	1,15E-2	4,6E-3	0E0	MND	MND	MND	MND	MND	MND	MND	2,79E-3	2,03E-3	4,13E-3	5,31E-5	-1,4E-3
POCP (“smog”)	kg O_3e	8,81E-1	2,01E-1	1,5E-1	1,23E0	4,39E-1	0E0	MND	MND	MND	MND	MND	MND	MND	9,69E-1	1,94E-1	1,27E0	1,09E-2	-2,78E-1
ADP-fossil	MJ	2,33E1	1,04E1	7,28E0	4,09E1	2,29E1	0E0	MND	MND	MND	MND	MND	MND	MND	6,71E0	1,01E1	9,06E0	2,13E-1	-5,1E0

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Elisabet Amat as an authorized verifier acting for EPD Hub Limited
17.02.2023

VERIFIED ISO 14025