ENVIRONMENTAL PRODUCT DECLARATION

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

LOW CARBON PRECAST COLUMN

CONSOLIS PARMA

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	Consolis Parma
Address	Hiidenmäentie 20 03101, Nummela
Contact details	heini.saloinen@consolis.com
Website	https://parma.fi/

PRODUCT IDENTIFICATION

Product name	Low Carbon Precast Column
Additional label(s)	SFS- EN 13225, FI TR15
Product number / reference	GP
Place(s) of production	Nummela, Finland

The Building Information Foundation RTS sr

EPDs within the same product category but from different programmes may not be comparable.

Jukka Seppänen
RTS EPD Committee Secretary

Laura Apilo
Managing Director

EPD INFORMATION

The EPD owner has the sole ownership, liability, and responsibility for the EPD. Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	Building Information Foundation RTS sr / Building Information Ltd Malminkatu 16 A, 00100 Helsinki, Finland
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN15904 serves as the core PCR. In addition, the RTS PCR (Finnish version, 26.8.2020) is used.
EPD author	Heini Saloinen Consolis Parma
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
Verification date	03.02.2022
EPD verifier	Ipek Goktas, One Click LCA, www.oneclicklca.com
EPD number	RTS_172_22
ECO Platform nr.	-
Publishing date	February 15, 2022
EPD valid until	February 15, 2027

PRODUCT INFORMATION

PRODUCT DESCRIPTION

Precast concrete columns are linear structural building components.

PRODUCT APPLICATION

Precast concrete columns are typically used in building construction to support beams or slabs.

TECHNICAL SPECIFICATIONS

For precast concrete column, concrete with various different strength classes can be used, but the minimum concrete strength class is C30/37.

PRODUCT STANDARDS

EN 206, EN 13369, EN 13225 standards. Precast concrete products.

PHYSICAL PROPERTIES OF THE PRODUCT

Typical physical properties: Material density 2500 kg/m3
Dimensions: according to the project-based design. Product properties can be found on the manufacturer website at https://parma.fi

ADDITIONAL TECHNICAL INFORMATION

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

PRODUCT RAW MATERIAL COMPOSITION

Product and Packaging Material	Weight, kg	Post-consumer %	Industrial by-product %	Renewable %	Country Region of origin
Aggregate, fine	435	-	-	-	Finland
Aggregate, coarse	271	-	-	-	Finland
Cement and secondary-cementitious binders	183	-	52%	-	Finland
Reinforcement	38	98%	-	-	EU
Water	72	-	-	-	Finland
Admixtures	1	-	-	-	Finland

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	4	EU
Minerals	96	EU
Fossil materials	-	-
Bio-based materials	-	-

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

MANUFACTURING AND PACKAGING (A1-A3)

The production of the concrete precast column elements begins with the preparation of the casting mold, which includes cleaning the casting platform. At the same time, reinforcement steel braids are put into place. When the reinforcements are in place, fresh concrete is poured onto the cast. After casting and finishing, the element is left to cure. When the element is cured the mould is removed. The final stage is finishing the product and transporting to the storage. Eventually, the elements are moved out and transported to the construction site.

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. 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, 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 demolished low carbon precast column element is delivered to the nearest construction waste treatment plant (C2). At the waste treatment plant, waste that can be reused, recycled or recovered for energy is separated and diverted for further use (C3). Unusable materials are disposed of in a landfill (C4). Due to the recycling potential of reinforcement steel and concrete, they can be used as secondary raw material. This avoids the use of virgin raw materials (D).

MANUFACTURING PROCESS

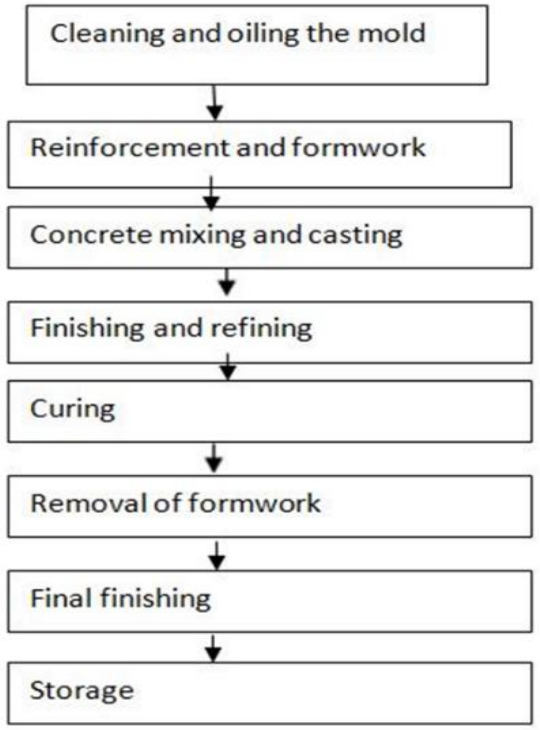

Figure 1. Manufacturing process

LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	Calendar year 2020

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 tonne
Mass per declared unit	1000 kg

BIOGENIC CARBON CONTENT

The product does not contain biogenic carbon at the factory gate.
The product is delivered without packaging.

SYSTEM BOUNDARY

This EPD covers cradle to gate with module A4, modules C1-C4 and module D; A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary is included.

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	D	D
x	x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	MND	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.

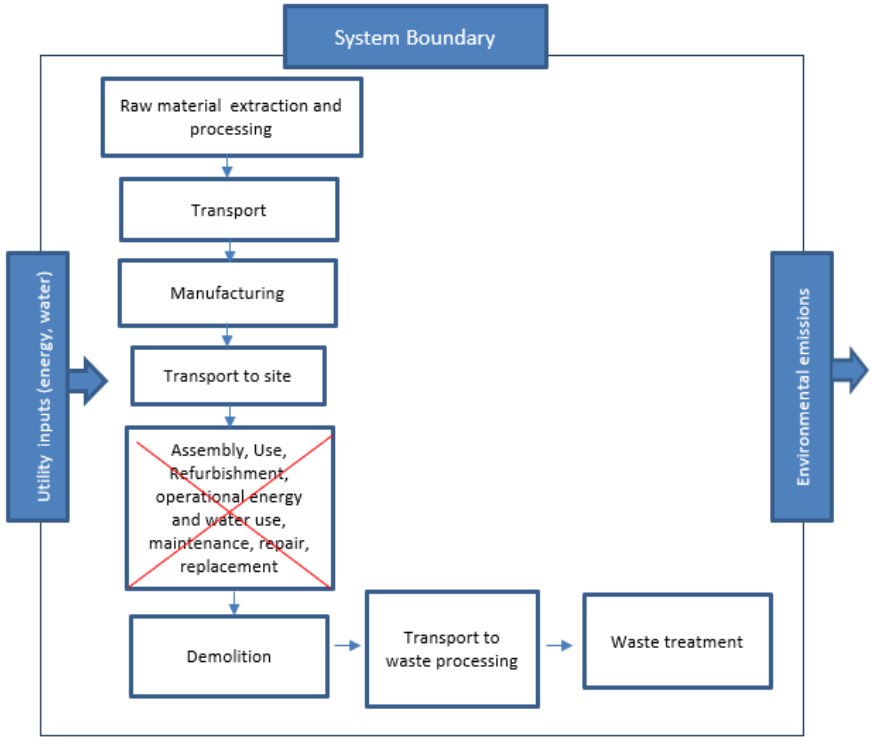

Fig.2 LCA flow Diagram

CUT-OFF CRITERIA

All inputs and outputs of the unit processes are available and included in the calculation. There is no neglected unit process more than 1% of total mass and energy flows. The total neglected input and output flows do also not exceed 5% of energy usage or mass. The life cycle analysis includes all industrial processes from raw material acquisition to production, distribution and end-of-life stages.

For easier modelling and because of lack of accuracy in available modelling resources many constituents under 1% of product mass are excluded. These include for example lifting loops which are all present in the product only in very small amounts and have no serious impact on the emissions of the product. The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and by-products data cannot be measured separately for the product under investigation. In this study, as per EN 15804, allocation is conducted in the following order;

1. Allocation should be avoided.

2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.

3. Allocation should be based on economic values.

As it is impossible to collect raw material, ancillary material and energy consumption data separately for each product produced the in the plant, data is allocated. Allocation is based on annual production rate of precast column and made with high accuracy and precision.

The values for 1 tonne of element are calculated by considering the total product weight per annual production. In the factory, several kinds of concrete elements are produced; since the production processes of these products are similar, the annual production percentages are taken into consideration for allocation. According to the ratio of the annual production of the declared product to the total annual production at the factory, the annual total raw materials and energy consumption per the declared product are allocated. Subsequently, the product output fixed to 1000 kg and the corresponding amount of product is used in the calculations. This LCA study is conducted in accordance with all methodological considerations, such as performance, system boundaries, data quality, allocation procedures, and decision rules to evaluate inputs and outputs. All estimations and assumptions are given below:

• Module A4: The transportation distance is defined according to RTS PCR. It was assumed that typical installation place is situated in the region of the production plant. Average distance of transportation from production plant to building site is equal to 70 km. Transportation method is assumed to be lorry. The transportation doesn't cause losses as products are fixed properly. Also, volume capacity utilisation factor is assumed to be 1 for the product.

• Module C1: Energy consumption of a demolition process is on the average 1 l of diesel/ tonne (Kivikolmio 2020). Therefore, energy consumption demolition is 10 kWh/ 1000 kg. The source of energy is diesel fuel used by work machines.

• Module C2: It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed that it has the same weight with the declared product. All of the end-of-life product is assumed to be sent to the closest facilities such as recycling and landfill. Transportation distance to the closest disposal

area is estimated as 40 km and the transportation method is lorry which is the most common.

• Module A2, A4 & C2: Vehicle capacity utilization volume factor is assumed to be 1 which means full load. In reality, it may vary but as role of transportation emission 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.

• Module C3: At the beginning of 2020 waste restrictions in Finland were tightened and the amount of waste going to landfill is restricted compared to the last years, so it can be assumed that 100% of solid wall are transported to a waste treatment plant, where the slabs are crushed, and steel is separated. About 99% of steel and concrete (Kivikolmio 2020) are recycled. The process losses of the waste treatment plant are assumed to be negligible. Share of losses in sorting process are assumed to be very small, about 1 %.

• Module C4: The remaining 1% of concrete and 1% of steel are assumed to be send to the landfill. Loss is minimal because products consist only of concrete and steel.

• Module D: The recycled 99% of concrete and 99% of steel are converted into a raw material after recycling.

Allocation used in Ecoinvent 3.6 environmental data sources follows the methodology 'allocation, cut-off by classification'. This methodology is in line with the requirements of the EN 15804 - standard.

ENVIRONMENTAL IMPACT DATA

Note: additional environmental impact data may be presented in annexes.

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	kg CO_2e	1,05E2	9,47E0	6,87E0	1,21E2	8,84E0	MND	MND	MND	MND	MND	MND	MND	MND	3,3E0	5,15E0	4,75E0	5,28E-2	-7,94E0
GWP – fossil	kg CO_2e	1,02E2	9,47E0	6,66E0	1,18E2	8,92E0	MND	MND	MND	MND	MND	MND	MND	MND	3,3E0	5,15E0	4,8E0	5,27E-2	-7,85E0
GWP – biogenic	kg CO_2e	2,38E0	5,75E-3	1,35E-1	2,52E0	5,46E-3	MND	MND	MND	MND	MND	MND	MND	MND	9,17E-4	3,15E-3	-5,67E-2	1,04E-4	-8,51E-2
GWP – LULUC	kg CO_2e	5,54E-2	3,36E-3	7,19E-2	1,31E-1	3,15E-3	MND	MND	MND	MND	MND	MND	MND	MND	2,79E-4	1,82E-3	1,46E-3	1,56E-5	-9,35E-3
Ozone depletion pot.	kg CFC_{-11}e	4,15E-6	2,17E-6	9,94E-7	7,32E-6	2,04E-6	MND	MND	MND	MND	MND	MND	MND	MND	7,12E-7	1,18E-6	9,65E-7	2,17E-8	-6,67E-7
Acidification potential	mol H^+e	3,63E-1	4,03E-2	3,54E-2	4,38E-1	3,67E-2	MND	MND	MND	MND	MND	MND	MND	MND	3,45E-2	2,12E-2	5,19E-2	5E-4	-5,01E-2
EP-freshwater[2)]	kg Pe	2,26E-3	8,16E-5	4,55E-4	2,8E-3	7,71E-5	MND	MND	MND	MND	MND	MND	MND	MND	1,33E-5	4,45E-5	8,48E-5	6,36E-7	-5,01E-4
EP-marine	kg Ne	1E-1	1,19E-2	8,45E-3	1,21E-1	1,09E-2	MND	MND	MND	MND	MND	MND	MND	MND	1,52E-2	6,28E-3	2,02E-2	1,72E-4	-1,05E-2
EP-terrestrial	mol Ne	1,15E0	1,31E-1	1,17E-1	1,4E0	1,2E-1	MND	MND	MND	MND	MND	MND	MND	MND	1,67E-1	6,94E-2	2,24E-1	1,9E-3	-1,37E-1
POCP (“smog”)	kg NMVOCe	2,94E-1	4,09E-2	2,66E-2	3,62E-1	3,77E-2	MND	MND	MND	MND	MND	MND	MND	MND	4,59E-2	2,18E-2	6,14E-2	5,51E-4	-3,65E-2
ADP-minerals & metals	kg Sbe	8,34E-4	2,35E-4	2,13E-5	1,09E-3	2,23E-4	MND	MND	MND	MND	MND	MND	MND	MND	5,03E-6	1,29E-4	6,16E-5	4,81E-7	-7,96E-4
ADP-fossil resources	MJ	6,12E2	1,44E2	2E2	9,57E2	1,36E2	MND	MND	MND	MND	MND	MND	MND	MND	4,54E1	7,86E1	6,62E1	1,47E0	-1,08E2
Water use[1)]	m^3e depr.	2,24E1	5,12E-1	1,34E0	2,42E1	4,83E-1	MND	MND	MND	MND	MND	MND	MND	MND	8,46E-2	2,79E-1	2,96E-1	6,81E-2	-1,3E1

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) 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 experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO_4e.

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	1,97E-6	7,28E-7	2,42E-7	2,94E-6	6,88E-7	MND	MND	MND	MND	MND	MND	MND	MND	9,14E-7	3,97E-7	4,97E-6	9,72E-9	-6E-7
Ionizing radiation[3)]	kBq U235e	2,25E0	6,31E-1	4,97E0	7,85E0	5,95E-1	MND	MND	MND	MND	MND	MND	MND	MND	1,94E-1	3,43E-1	2,94E-1	6,04E-3	-6,45E-1
Ecotoxicity (freshwater)	CTUe	1,05E3	1,13E2	2,18E2	1,38E3	1,06E2	MND	MND	MND	MND	MND	MND	MND	MND	2,66E1	6,13E1	9E1	9,29E-1	-1,67E2
Human toxicity, cancer	CTUh	1,73E-8	3,2E-9	3,03E-9	2,35E-8	3,01E-9	MND	MND	MND	MND	MND	MND	MND	MND	9,53E-10	1,74E-9	2,56E-9	2,2E-11	-1,04E-8
Human tox. non-cancer	CTUh	6,93E-7	1,29E-7	9,98E-8	9,22E-7	1,22E-7	MND	MND	MND	MND	MND	MND	MND	MND	2,35E-8	7,04E-8	9,66E-8	6,79E-10	-5,89E-8
SQP	-	1,53E3	1,6E2	7,75E0	1,69E3	1,52E2	MND	MND	MND	MND	MND	MND	MND	MND	1,16E0	8,75E1	4,82E0	2,5E0	-7,22E1

4) SQP = Land use related impacts/soil quality.5) 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.

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	MJ	1,98E2	2,04E0	1,4E2	3,4E2	1,93E0	MND	MND	MND	MND	MND	MND	MND	MND	2,45E-1	1,12E0	2,47E0	1,19E-2	-9,3E0
Renew. PER as material	MJ	2,35E-1	0E0	0E0	2,35E-1	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	1,98E2	2,04E0	1,4E2	3,41E2	1,93E0	MND	MND	MND	MND	MND	MND	MND	MND	2,45E-1	1,12E0	2,47E0	1,19E-2	-9,3E0
Non-re. PER as energy	MJ	6,16E2	1,44E2	2E2	9,61E2	1,36E2	MND	MND	MND	MND	MND	MND	MND	MND	4,54E1	7,86E1	6,62E1	1,47E0	-1,08E2
Non-re. PER as material	MJ	1,27E1	0E0	0E0	1,27E1	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	6,29E2	1,44E2	2E2	9,74E2	1,36E2	MND	MND	MND	MND	MND	MND	MND	MND	4,54E1	7,86E1	6,62E1	1,47E0	-1,08E2
Secondary materials	kg	4,71E1	0E0	8,9E-4	4,71E1	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	3,04E-1
Renew. secondary fuels	MJ	3,96E0	0E0	0E0	3,96E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	3,68E1	0E0	0E0	3,68E1	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m³	6,68E0	2,73E-2	5,56E-2	6,76E0	2,58E-2	MND	MND	MND	MND	MND	MND	MND	MND	4,01E-3	1,49E-2	1,03E-2	1,61E-3	-1,02E0

6) 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	1,75E0	1,5E-1	4,94E-1	2,39E0	1,42E-1	MND	MND	MND	MND	MND	MND	MND	MND	4,88E-2	8,17E-2	0E0	1,37E-3	-8,24E-1
Non-hazardous waste	kg	7,58E1	1,24E1	9,04E0	9,73E1	1,18E1	MND	MND	MND	MND	MND	MND	MND	MND	5,22E-1	6,79E0	0E0	1E1	-2,42E1
Radioactive waste	kg	9,17E-3	9,87E-4	2,16E-3	1,23E-2	9,31E-4	MND	MND	MND	MND	MND	MND	MND	MND	3,18E-4	5,37E-4	0E0	9,74E-6	-4,69E-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	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	7,29E0	0E0	0E0	7,29E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	9,9E2	0E0	0E0
Materials for energy rec	kg	4,28E-2	0E0	0E0	4,28E-2	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total	kg CO_2e	1,05E-1	9,47E-3	6,87E-3	1,21E-1	8,93E-3	MND	MND	MND	MND	MND	MND	MND	MND	3,3E-3	5,15E-3	4,75E-3	5,28E-5	-7,94E-3
ADP-minerals & metals	kg Sbe	8,34E-7	2,35E-7	2,13E-8	1,09E-6	2,23E-7	MND	MND	MND	MND	MND	MND	MND	MND	5,03E-9	1,29E-7	6,16E-8	4,81E-10	-7,96E-7
ADP-fossil	MJ	6,12E-1	1,44E-1	2E-1	9,57E-1	1,36E-1	MND	MND	MND	MND	MND	MND	MND	MND	4,54E-2	7,86E-2	6,62E-2	1,47E-3	-1,08E-1
Water use	m^3e depr.	2,24E-2	5,12E-4	1,34E-3	2,42E-2	4,83E-4	MND	MND	MND	MND	MND	MND	MND	MND	8,46E-5	2,79E-4	2,96E-4	6,81E-5	-1,3E-2
Secondary materials	kg	4,71E-2	0E0	8,9E-7	4,71E-2	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	3,04E-4
Biog. C in product	kg C	N/A	N/A	0E0	0E0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biog. C in packaging	kg C	N/A	N/A	0E0	0E0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

7) Biog. C in product = Biogenic carbon content in product

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity, high voltage, production mix (Reference product: electricity, high voltage) Finland, Ecoinvent 3.6, year: 2019
Electricity CO_2e / kWh	0,23 Kg Co2/kWh
District heating data source and quality	Heat and power co-generation, wood chips, 6667 kw, state-of-the-art 2014 (Reference product: heat, district or industrial, other than natural gas) Finland, Ecoinvent 3.6, year: 2019
District heating CO_2e / MJ	0,0031 kg Co2/MJ
Diesel data source and quality	Diesel, burned in diesel-electric generating set, 10mw (Reference product: diesel, burned in diesel-electric generating set, 10mw) Ecoinvent 3.6, Global, year: 2019
Diesel CO2e/kWh	0.09

Transport scenario documentation (A4)

Scenario parameter	Value
Specific transport CO_2e emissions, kg CO_2e / tkm	0,132
Average transport distance, km	70
Capacity utilization (including empty return) %	100
Bulk density of transported products	2500 kg/m3
Volume capacity utilization factor	1

End of life scenario documentation

Scenario parameter	Value
Collection process – kg collected separately	1000
Collection process – kg collected with mixed waste	-
Recovery process – kg for re-use	-
Recovery process – kg for recycling	990
Recovery process – kg for energy recovery	-
Disposal (total) – kg for final deposition	10
Scenario assumptions e.g. transportation	End-of-life product is transported 40 km with an average lorry.

BIBLIOGRAPHY

ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations. Principles and procedures.

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.

Ecoinvent database v3.6 (2019) and One Click LCA database.

EN 15804:2012+A2:2019 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

RTS PCR EN 15804:2019 RTS PCR in line with EN 15804+A2. Published by the Building Information Foundation RTS 1.6.2020.

Low Carbon Column LCA background report 22.11.2021

Kivikolmio 2020 Heikkilä Iivari production manager email 26.5.2020

ABOUT THE MANUFACTURER

Consolis Parma is leading precast concrete producer in Finland belonging to CONSOLIS group. The company operates in 16 locations with around 700 employees. www.parma.fi

CONSOLIS is a European leader industrial group providing sustainable and smart precast concrete structures for the building and utilities sectors. www.consolis.com

EPD AUTHOR AND CONTRIBUTORS

Manufacturer	Consolis Parma
EPD author	Heini Saloinen
EPD verifier	Ipek Goktas, One Click LCA, www.oneclicklca.com
EPD program operator	The Building Information Foundation RTS sr
Background data	This EPD is based on Ecoinvent 3.6 (cut-off) and One Click LCA databases.
LCA software	The LCA and EPD have been created using One Click LCA Pre-Verified EPD Generator for Cementitious Products

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 EN 15804, 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 background report (project report) for this EPD

Why does verification transparency matter? Read more online.

VERIFICATION OVERVIEW

Following independent third party has verified this specific EPD:

EPD verification information	Answer
Independent EPD verifier	Ipek Goktas, One Click LCA
EPD verification started on	18.01.2022
EPD verification completed on	03.02.2022
Approver of the EPD verifier	The Building Information Foundation RTS sr

Author & tool verification	Answer
EPD author	Heini Saloinen, Consolis Parma
EPD author training completion	30.9.2020
EPD Generator module	Cementitious Products
Independent software verifier	Anni Oviir, Rangi Maja OÜ
Software verification date	27.6.2020

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 EN 15804:2012+A2:2019.

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.

Ipek Goktas, One Click LCA

ANNEX 1 : 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	9,96E1	9,38E0	6,59E0	1,16E2	8,84E0	MND	MND	MND	MND	MND	MND	MND	MND	3,27E0	5,1E0	4,76E0	5,17E-2	-7,66E0
Ozone depletion Pot.	kg CFC_{-11}e	3,7E-6	1,73E-6	1,31E-6	6,73E-6	1,63E-6	MND	MND	MND	MND	MND	MND	MND	MND	5,63E-7	9,39E-7	7,72E-7	1,72E-8	-6,08E-7
Acidification	kg SO_2e	2,88E-1	2,04E-2	2,62E-2	3,34E-1	1,82E-2	MND	MND	MND	MND	MND	MND	MND	MND	4,87E-3	1,05E-2	1,32E-2	2,08E-4	-3,16E-2
Eutrophication	kg PO_4^3e	6,75E-2	4,13E-3	1,01E-2	8,17E-2	3,78E-3	MND	MND	MND	MND	MND	MND	MND	MND	8,57E-4	2,18E-3	4,08E-3	4,03E-5	-1,74E-2
POCP (“smog”)	kg C_2H_4e	1,13E-2	1,27E-3	1,03E-3	1,36E-2	1,18E-3	MND	MND	MND	MND	MND	MND	MND	MND	5,01E-4	6,78E-4	9,33E-4	1,53E-5	-2,83E-3
ADP-elements	kg Sbe	8,34E-4	2,35E-4	2,13E-5	1,09E-3	2,23E-4	MND	MND	MND	MND	MND	MND	MND	MND	5,03E-6	1,29E-4	6,16E-5	4,81E-7	-7,96E-4
ADP-fossil	MJ	6,12E2	1,44E2	2E2	9,57E2	1,36E2	MND	MND	MND	MND	MND	MND	MND	MND	4,54E1	7,86E1	6,62E1	1,47E0	-1,08E2

ANNEX 2 : 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	8,43E1	9,37E0	6,6E0	1E2	8,83E0	MND	MND	MND	MND	MND	MND	MND	MND	3,26E0	5,09E0	4,74E0	5,14E-2	-7,6E0
Ozone Depletion	kg CFC_{-11}e	4,57E-6	2,3E-6	1,59E-6	8,46E-6	2,17E-6	MND	MND	MND	MND	MND	MND	MND	MND	7,51E-7	1,25E-6	1,03E-6	2,29E-8	-8,06E-7
Acidification	kg SO_2e	2,86E-1	3,5E-2	2,93E-2	3,5E-1	3,19E-2	MND	MND	MND	MND	MND	MND	MND	MND	3,16E-2	1,84E-2	4,67E-2	4,43E-4	-4,23E-2
Eutrophication	kg Ne	2,25E-2	4,82E-3	3,51E-3	3,08E-2	4,51E-3	MND	MND	MND	MND	MND	MND	MND	MND	2,79E-3	2,6E-3	4,22E-3	5,31E-5	-5,7E-3
POCP (“smog”)	kg O_3e	3,94E0	7,52E-1	5,18E-1	5,21E0	6,89E-1	MND	MND	MND	MND	MND	MND	MND	MND	9,69E-1	3,98E-1	1,29E0	1,09E-2	-6,49E-1
ADP-fossil	MJ	4,7E1	2,06E1	4,7E0	7,23E1	1,94E1	MND	MND	MND	MND	MND	MND	MND	MND	6,71E0	1,12E1	9,17E0	2,13E-1	-7,91E0