

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Concrete Piles – Kollanda factory (Viridis)
Centrum Pile AB



EPD HUB, HUB-6828
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Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Centrum Pile AB
Address	Kollanda 110, 446 95 Älvängen, Sweden
Contact details	info@centrumpile.se
Website	www.centrumpile.se

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.

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025 EN 16757 Product Category Rules for concrete and concrete elements
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4, and modules C1-C4, D
EPD author	Svante Karlsson/Thorelundconsulting
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Vera Durão, as an authorised verifier acting for EPD Hub Limited

PRODUCT

Product name	Concrete Piles – Kollanda factory (Viridis)
Additional labels	-
Product reference	-
Place(s) of raw material origin	Sweden
Place of production	Kollanda, Sweden
Place(s) of installation and use	Sweden
Period for data	2025-01-01-2025-12-31
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	33
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	93

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 ton of concrete Pile
Declared unit mass	1000 kg
Mass of packaging	0 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	110
GWP-total, A1-A3 ($kgCO_2e$)	110
Secondary material, inputs (%)	8,33
Total energy use, A1-A3 (kWh)	385
Net freshwater use, A1-A3 (m^3)	0,38

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Since the start in 2008, Centrum Pile AB has established itself as one of the largest suppliers of concrete piles on the Swedish market. Today there are two factories, one in Kollanda (2008) outside Gothenburg and one in Dalby (2022) outside Lund. Centrum Pile AB is part of the Centrum Group, which with its factories in five different countries is Europe's largest manufacturer of concrete piles for the foundation of industrial and commercial premises, apartment buildings, infrastructure, and wind turbines. Centrum Pile AB invests in continuous development in processes and products to be a leader and set the standard in the market. Quality, flexibility, and short delivery times are the basis of Centrum's business.

The product is CE certified. The manufacturing is certified according to SS-EN 12794 Concrete Piles, and SS-EN 13369
Centrum Pile AB is certified according to ISO 14001:2015 and energy mapping according to STEMFS 2014:2.

PRODUCT DESCRIPTION

Concrete piles are prefabricated reinforced concrete foundation elements used for deep foundation systems in buildings and infrastructure projects where soil conditions require transfer of loads to stable soil layers or bedrock. The piles are driven into the ground and are designed to withstand axial loads and driving stresses during installation.

This EPD covers a product group of standardized precast reinforced concrete piles manufactured by Centrum Pile AB. The product range includes reinforced concrete piles with varying lengths, cross-sectional dimensions and reinforcement configurations manufactured using the same production technology, raw materials and intended application.

The environmental performance declared in this EPD represents a production-weighted average product based on the most commonly manufactured pile types included in the product group during the reference period. The selected average product is considered representative for the environmental performance of the declared product range due to similarities in material composition, manufacturing process and function. The representative production-weighted average product includes:

- Prefabricated reinforced concrete piles with square cross-sections
- Concrete produced according to EN 206
- Reinforcement steel cages and embedded steel components
- Variable pile lengths and reinforcement ratios depending on structural requirements and soil conditions

The declared product group includes products with varying:

- Pile lengths,
- Cross-sectional dimensions,
- Concrete volumes,
- Reinforcement ratios,
- And quantities of embedded steel components.

The primary function of all products included in the group is load transfer in deep foundation applications. Variations in environmental performance within the product group are mainly related to differences in concrete volume and reinforcement content, which are the main contributors to material consumption and associated environmental impacts.

The products are manufactured and assessed in accordance with:

- EN 12794:2005+A1:2007, Precast concrete products – Foundation piles

- EN 13369, Common rules for precast concrete products
- EN 206, Concrete – Specification, performance, production and conformity

Technical properties such as load-bearing capacity, concrete strength and dimensional tolerances are verified through factory production control and testing procedures in accordance with the applicable harmonized product standards.

The declared products are CE marked according to EN 12794:2005+A1:2007. Further information regarding product dimensions, reinforcement configurations and product variations included in the declared product group is presented in Annex 1 and Annex 2.

Further information can be found at:
www.centrumpile.se

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	3,92	Germany
Minerals	96,08	Sweden
Fossil materials	0	-
Bio-based materials	0	-

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 ton of concrete Pile
Mass per declared unit	1000 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	ND	ND	ND	ND	ND	ND	ND	ND	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

Not declared = ND.

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.

A market-based approach is used in modelling the electricity mix utilized in the factory.

The environmental impacts considered for the product stage (A1–A3) include the extraction and processing of raw materials, transportation of raw materials to the manufacturing site, and manufacturing of the product. This also includes ancillary materials, fuels used by machinery and internal transport operations, treatment of production waste, and material losses during manufacturing processes.

Raw materials including cement, aggregates and reinforcement steel are transported to the manufacturing facility mainly by truck using supplier-specific and generic transport data representative for the supply chain.

The production of concrete piles begins with the delivery of reinforcement steel by truck. The reinforcement is assembled into cages through welding and stored until production. Prior to casting, moulds are cleaned and treated with mould release agent to prepare for reinforcement placement.

Raw materials for concrete are delivered by truck and stored in covered silos. The concrete production process includes weighing and mixing of materials in a concrete mixer, after which the fresh concrete is transferred via a hopper to the casting machine.

The piles are cast with an estimated production waste of 0.2%. After casting, the piles are covered with plastic and allowed to cure until the following day. They are then demoulded and transferred to storage.

The manufacturing process is powered primarily by electricity. Electricity consumption at the manufacturing facility was modelled using a Swedish residual electricity mix dataset. No supplier-specific electricity contracts or guarantees of origin have been applied. Transmission losses are included in the modelling. Diesel is also used on site for machinery and internal transport operations.

Ancillary materials used in the manufacturing process include mould release agents and welding materials.

No packaging materials are used for the final product.
Defective or non-compliant piles are reused internally for secondary applications such as barriers, landscaping elements, or ground beams. Production waste, consisting mainly of concrete waste, reinforcement steel scrap and aggregates, is assumed to be fully recycled (100%). Transport of production waste to recycling or waste treatment facilities is included in the assessment using generic transport scenarios representative for waste treatment operations.

TRANSPORT AND INSTALLATION (A4-A5)

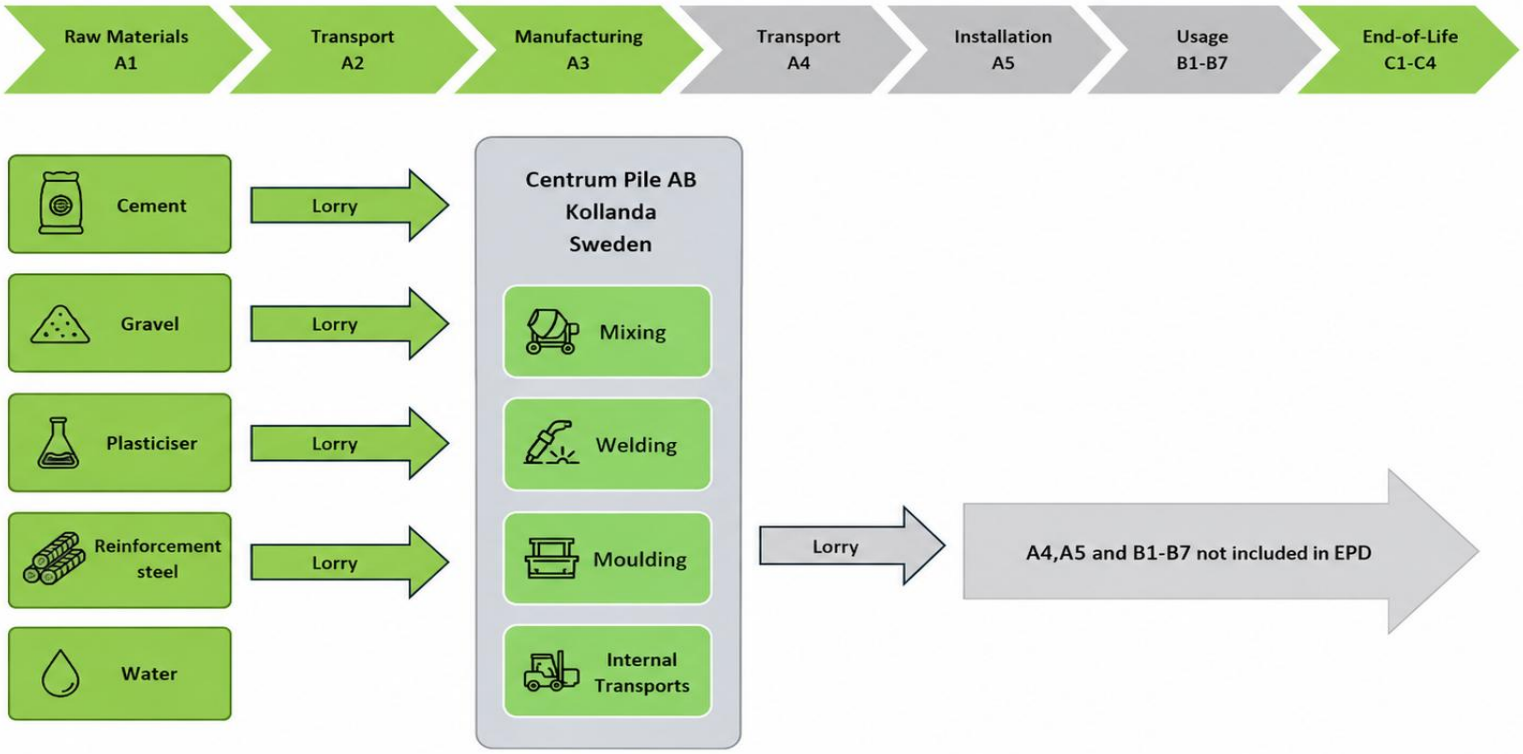
Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Transportation impacts in module A4 include direct exhaust emissions from fuel combustion, as well as upstream impacts from fuel production and related infrastructure. A transport distance of 100 km by lorry is assumed for delivery to the construction site.
A load factor of 80% is applied, based on supplier-specific data. This represents the average utilisation of the transport vehicle, including empty return trips.
No installation processes are included in module A5, and therefore no impacts are reported for this stage.

PRODUCT END OF LIFE (C1-C4, D)

The end-of-life stage is included in the scope of the study in accordance with EN 15804+A2. Concrete piles are normally not removed from the ground at the end of their service life but remain permanently in situ. No extraction, demolition, cutting, crushing, reuse, recycling or energy recovery is assumed for the declared product.
Module C1 is declared as zero, since no demolition or removal process is included. Module C2 is declared as zero, since no transport to waste treatment is assumed when the piles remain in the ground. Module C3 is declared as zero, since no waste processing, sorting or recycling is assumed. As a conservative approach, module C4 is modelled using an inert waste disposal/landfill dataset to represent the reinforced concrete piles remaining in the ground. This is considered a conservative proxy, as the product is left in situ and no active landfill operation takes place.
Module D is declared as zero, since no benefits from reuse, recycling, recovery or substitution are claimed..

SYSTEM DIAGRAM



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.

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.

All industrial processes from raw material acquisition and pre-processing, production, and end-of-life management are included in the assessment. Minor constituents with negligible environmental relevance may be excluded if their contribution is below 0.1 wt-% of the declared product, in accordance with EN 15804 and the applicable PCR. In this study, the only excluded material is mould release agent (form oil) used in the production process. The quantity of mould release agent was assessed to be below 0.1 wt-% of the representative production-weighted average product.
Water used for cleaning and maintenance of production equipment was also excluded due to its negligible contribution.
The production and maintenance of capital equipment, construction activities, infrastructure, personnel-related activities, and energy and water use related to company management and sales activities are excluded from the study.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

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	Physical Properties
Packaging material	Not applicable
Ancillary materials	Physical Properties
Manufacturing energy and waste	Physical Properties

All estimations and assumptions are given below.▪ Modules A2, A4 : Vehicle capacity utilization and empty returns are considered in the ecoinvent background data. It may vary but as the role of transportation emission in total results is small and so the variety is assumed to be negligible.

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple products
Grouping method	Based on a representative product
Variation in GWP-fossil for A1-A3, %	33

The declared environmental results represent a production-weighted average environmental performance of the most commonly manufactured reinforced concrete pile products produced at the Kollanda manufacturing facility during the reference period. The EPD therefore represents an average of the most common products manufactured at one production plant.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.5. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11/3.12 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11/3.12 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

EN 15804:2012+A2:2019/AC:2021, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures
ISO 14040:2006, Environmental management – Life cycle assessment – Principles and framework
ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines
EPD Hub, General Programme Instructions, version valid at the time of the study
EPD Hub, Core Product Category Rules (PCR), Version 1.2, 24 March 2025
EN 16757:2017, Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete elements
European Commission, Joint Research Centre (JRC), Characterisation factors of the Environmental Footprint method (EF 3.1)
One Click LCA, EPD Generator for EPD Hub V3, EPD Process Certification v3.2.4
Ecoinvent Association, Ecoinvent database v3.10.1 / v3.11 / v3.12
Centrum Pile AB, manufacturer-specific data from Kollanda factory, reporting period 2023

ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

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	9,95E+01	7,56E+00	3,26E+00	1,10E+02	1,03E+01	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	6,26E+00	0,00E+00
GWP – fossil	kg CO_2e	9,89E+01	7,55E+00	3,22E+00	1,10E+02	1,03E+01	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	6,26E+00	0,00E+00
GWP – biogenic	kg CO_2e	5,85E-01	1,68E-03	2,02E-02	6,07E-01	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,98E-03	0,00E+00
GWP – LULUC	kg CO_2e	2,66E-02	3,16E-03	1,44E-02	4,42E-02	4,03E-03	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	3,56E-03	0,00E+00
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	2,93E-06	1,34E-07	6,73E-08	3,13E-06	2,16E-07	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,83E-07	0,00E+00
Acidification potential	mol H^+e	3,68E-01	2,19E-02	2,24E-02	4,13E-01	2,44E-02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	4,31E-02	0,00E+00
EP-freshwater[2)]	kg Pe	7,97E-04	5,70E-04	2,58E-04	1,63E-03	7,23E-04	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	5,51E-04	0,00E+00
EP-marine	kg Ne	1,17E-01	6,60E-03	9,42E-03	1,33E-01	6,40E-03	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,71E-02	0,00E+00
EP-terrestrial	mol Ne	1,32E+00	7,16E-02	1,05E-01	1,50E+00	6,93E-02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,86E-01	0,00E+00
POCP ("smog")[3)]	kg NMVOCe	3,28E-01	3,45E-02	3,35E-02	3,96E-01	4,24E-02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	6,72E-02	0,00E+00
ADP-minerals & metals[4)]	kg Sbe	8,45E-04	2,14E-05	7,69E-06	8,74E-04	2,96E-05	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	9,50E-06	0,00E+00
ADP-fossil resources	MJ	5,93E+02	1,11E+02	9,23E+01	7,97E+02	1,55E+02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,53E+02	0,00E+00
Water use[5)]	m^3e depr.	1,12E+04	5,66E-01	1,16E+00	1,12E+04	7,95E-01	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	6,72E+00	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, EF 3.1

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	1,76E-06	7,45E-07	5,75E-07	3,08E-06	1,01E-06	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,01E-06	0,00E+00
Ionizing radiation[6)]	kBq U235e	1,75E+00	1,16E-01	4,07E+00	5,94E+00	1,87E-01	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	8,82E-02	0,00E+00
Ecotoxicity (freshwater)	CTUe	3,73E+02	1,48E+01	4,17E+01	4,30E+02	1,83E+01	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,91E+01	0,00E+00
Human toxicity, cancer	CTUh	1,48E-08	1,25E-09	5,86E-10	1,66E-08	1,72E-09	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,10E-09	0,00E+00
Human tox. non-cancer	CTUh	2,11E-07	7,19E-08	1,80E-08	3,01E-07	1,00E-07	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	2,65E-08	0,00E+00
SQP[7)]	-	1,81E+02	1,12E+02	4,13E+01	3,34E+02	1,56E+02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	3,02E+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	2,08E+02	1,67E+00	1,99E+01	2,30E+02	2,53E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,42E+00	0,00E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	2,08E+02	1,67E+00	1,99E+01	2,30E+02	2,53E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,42E+00	0,00E+00
Non-re. PER as energy	MJ	6,07E+02	1,11E+02	8,26E+01	8,01E+02	1,55E+02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,53E+02	0,00E+00
Non-re. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	6,07E+02	1,11E+02	8,26E+01	8,01E+02	1,55E+02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,53E+02	0,00E+00
Secondary materials	kg	8,33E+01	4,78E-02	1,62E-02	8,33E+01	6,72E-02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	3,80E-02	0,00E+00
Renew. secondary fuels	MJ	5,09E+01	6,05E-04	1,54E-04	5,09E+01	8,47E-04	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	7,97E-04	0,00E+00
Non-ren. secondary fuels	MJ	3,03E+02	0,00E+00	0,00E+00	3,03E+02	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	3,35E-01	1,64E-02	2,77E-02	3,79E-01	2,29E-02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	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	4,29E-01	2,02E-01	8,10E-02	7,12E-01	2,25E-01	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	4,96E-01	0,00E+00
Non-hazardous waste	kg	1,52E+01	3,91E+00	1,14E+01	3,06E+01	4,50E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,00E+03	0,00E+00
Radioactive waste	kg	1,58E-02	2,84E-05	8,69E-04	1,67E-02	4,63E-05	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	2,08E-05	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	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	2,72E+00	2,72E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	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	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	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	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

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	0,00E+00	7,51E+00	2,57E+00	1,01E+01	1,03E+01	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	6,20E+00	0,00E+00
Ozone depletion Pot.	kg $CFC_{-11}e$	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Acidification	kg SO_2e	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Eutrophication	kg PO_4^3e	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
POCP (“smog”)	kg C_2H_4e	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADP-elements	kg Sbe	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADP-fossil	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ADDITIONAL INDICATOR – GWP-GHG

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	9,90E+01	7,55E+00	3,24E+00	1,10E+02	1,03E+01	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	6,26E+00	0,00E+00

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

1. Diesel, burned in building machine, World, Ecoinvent, 0.10 kgCO2e/MJ
2. Diesel, burned in building machine, World, Ecoinvent, 0.10 kgCO2e/MJ
3. Electricity, medium voltage, residual mix, Sweden, Ecoinvent, 0.0836 kgCO2e/kWh

Transport scenario documentation - A4 (Transport resources)

1. Market for transport, freight, lorry >32 metric ton, EURO6, 100 km

Transport to the building site (A4) - Scenario documentation

Scenario parameter	Value
Capacity utilization (including empty return) %	80
Bulk density of transported products	0
Volume capacity utilization factor	1

End of life (C1-C4) - Scenario documentation

Scenario information	Value
Collection process: collected separately (kg)	
Collection process: Mixed waste (kg)	0
Recovery: re-use (kg)	0
Recovery: recycling (kg)	0
Recovery: energy recovery (kg)	0
Disposal (kg)	0
Scenario assumptions e.g. transportation (mode, km) & other	The scenario assumes that 100% of the concrete piles remain in the ground at end of life. No transport, waste processing, recycling, recovery or substitution is included.

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

Vera Durão, as an authorised verifier acting for EPD Hub Limited

27.06.2026



ANNEX 1

PILE TYPES WITH VARYING DIMENSIONS AND REINFORCEMENT BAR CONFIGURATIONS

Environmental impact (CO2) per meter of pile (A1-A3)						
Dim/Typ	**4**	**6**	**8**	**12**	**16**	**20**
200	11,1 kg	12,1 kg	13,1 kg	15,3 kg		
235	14,4 kg	15,5 kg	16,6 kg	18,6 kg	20,7 kg	
250	16,1 kg	16,9 kg	18,1 kg	20,2 kg	22,4 kg	
270	18,3 kg	19,1 kg	20,5 kg	22,3 kg	24,5 kg	25,5 kg
300	21,8 kg	23,2 kg	24,3 kg	26,0 kg	28,3 kg	30,1 kg
350	28,7 kg	30,7 kg	31,6 kg	33,4 kg	35,1 kg	36,9 kg
400	37,0 kg	37,9 kg	39,0 kg	42,1 kg	44,0 kg	46,0 kg
450	47,5 kg	48,3 kg	49,3 kg	51,2 kg	53,1 kg	55,1 kg

Environmental impact (CO2) per ton of pile (A1-A3) (A4)*						
Dim/Typ	**4**	**6**	**8**	**12**	**16**	**20**
200	112 kg	121 kg	129 kg	147 kg		
235	106 kg	113 kg	120 kg	132 kg	145 kg	
250	104 kg	110 kg	116 kg	128 kg	139 kg	
270	102 kg	107 kg	113 kg	123 kg	132 kg	135 kg
300	100 kg	104 kg	109 kg	117 kg	125 kg	132 kg
350	98 kg	101 kg	104 kg	110 kg	116 kg	122 kg
400	96 kg	99 kg	101 kg	105 kg	110 kg	115 kg
450	95 kg	97 kg	99 kg	102 kg	106 kg	110 kg

* Transport generates emissions of 10,3 kg CO_2 per pile transported 100 km
This is based on diesel as the fuel, but HVO is also available

All values are based on CEM II/B-M (S-LL) 52.5 N (Viridiscement)

To obtain the complete environmental impact, the emission from Annex 2 must be added to these values

ANNEX 2

ADDITIONAL INFORMATION FOR OPTIONAL ACCESSORIES, NOT INCLUDED IN THE DECLARED UNIT

Miljöpåverkan per skarv (CO2/stk) *		
	A1-A3	Transport/st/100 km
CPG-BOX-2-235	22,06 kg	0,122 kg
CPG-BOX-4-235	33,84 kg	0,205 kg
CPG-BOX-4-250	34,82 kg	0,209 kg
CPG-BOX-4-270	36,45 kg	0,215 kg
CPG-BOX-6-270	48,23 kg	0,297 kg
CPG-BOX-4-300	38,65 kg	0,223 kg
CPG-BOX-4-350	43,00 kg	0,241kg
CPG-BOX-8-350	66,56 kg	0,405 kg
CPG-BOX-4-400	47,45 kg	0,258 kg
CPG-BOX-8-400	71,01 kg	0,423 kg
CPG-BOX-4-450	52,11 kg	0,278 kg
CPG-BOX-8-450	75,67 kg	0,443 kg
Miljöpåverkan per bergssko (CO2/stk) **		
Dim/Typ	A1-A3	Transport/st/100 km
CPRP 235	46,33 kg	0,115 kg
CPRP 250	47,65 kg	0,117 kg
CPRP 270	64,93 kg	0,151 kg
CPRP 300	67,56 kg	0,157 kg
CPRP 350	146,72 kg	0,312 kg
CPRP 400	151,78 kg	0,322 kg

The values presented in Annex 2 refer to optional accessories such as pile joints and rock shoes. These components are not included in the declared unit of 1 tonne of concrete pile and are not included in the LCA results reported for the declared product. The values are provided as additional information only and shall be added separately when such accessories are used in a project.