

# ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804+A2



## Centrum Pæle A/S - Hedensted Ø490 Screw Pile, complete, ex. splitter S15 Concrete



### Owner of the declaration

Centrum Pæle A/S - Hedensted  
Teknikervej 1  
8722 Hedensted  
Denmark

### Product

Ø490 Screw Pile, complete, ex. splitter  
S15 Concrete

### Declared product / Functional unit

1 piece of Ø490 Screw Pile, complete, ex.  
splitter S15 Concrete

### This declaration is based on Product

#### Category Rules

EN 15804:2012 + A2:2019,  
NPCR 020 PART B for concrete and  
concrete elements (v3.0)

### Program operator:

EPD Norway  
Majorstuen P.O. Box 5250  
N-0303 Oslo  
Norway

### Declaration number

NEPD-10058-10058-2

### Registration number

NEPD-10058-10058-2

### Issue date

26.03.2025

### Valid to

25.03.2030

### EPD Software

Emidat EPD Tool v1.0.0

## General Information

### Product

Ø490 Screw Pile, complete, ex. splitter S15 Concrete

### Program Operator

EPD Norway  
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Norway  
Phone: +47 23 08 80 00  
Email: post@epd-norge.no

### Declaration Number

NEPD-10058-10058-2

### This declaration is based on Product Category Rules

EN 15804:2012 + A2:2019,  
NPCR 020 PART B for concrete and concrete elements  
(v3.0)

### Statements

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer, life cycle assessment data and evidences.

### Functional unit

1 piece of Ø490 Screw Pile, complete, ex. splitter S15 Concrete with a reference service life of 100 years

### General information on verification of EPD from EPD tools

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPDNorway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools.

### Verification of EPD tool

Charlotte Merlin, FORCE Technology  
(no signature required)

### Owner of the declaration

Centrum Pæle A/S - Hedensted

### Contact person

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### Phone

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### Email

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### Manufacturer

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8722 Hedensted, Denmark

### Place of production

Hedensted, Denmark

### Management system

ISO 9001, ISO 14001, ISO 50001, ISO 45001

### Issue date

26.03.2025

### Valid to

25.03.2030

### Year of study

2024

### Comparability

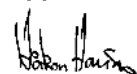
EPDs of construction products may not be comparable if they do not comply with EN 15804 and are not seen in a building context. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database (including primary and secondary data).

### Development and verification of EPD

The declaration was created using the Emidat EPD tool v1.0, developed by Emidat GmbH. The EPD tool has been approved by EPD Norway.

Developer of EPD: Civ. Eng. Emile Fabrice Angue  
Reviewer of company-specific input data and EPD: Civ. Eng. Jacob Dam Jacobsen

### Approved



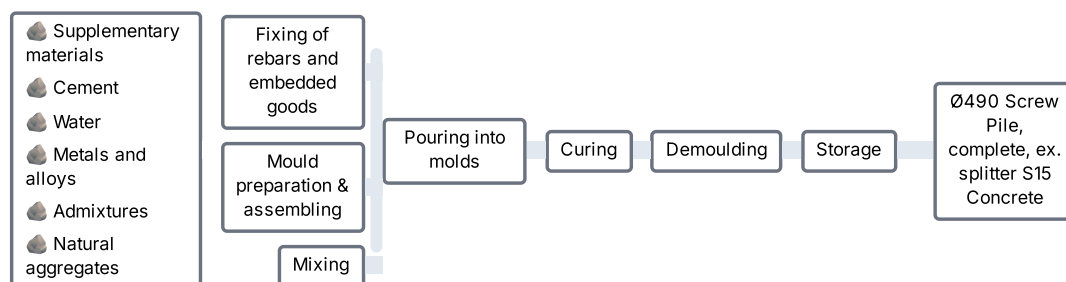
Håkon Hauan, CEO EPD-Norge

## Product

### Product description

A Screw Pile is a prefabricated full displacement concrete foundation pile and is designed with an external thread along the entire length and a steel tip connected to the bottom. The pile can also be completely or partially untreaded. It has a hollow core for installation with a custom-made drive rod mounted on a drilling rig. Installation of the screw pile is noiseless and vibration-free.

However, minor vibrations may occur when maneuvering the machine and handling equipment.



Centrum Prefabricated Screw Pile is particularly suitable as a pile foundation element in cohesive soil types with shear strengths up to 300-400 kN/m<sup>2</sup> and in non-cohesive soils with CPT cone penetration test  $q_c$  values up to 15-20 MPa.

In addition to the application listed below, screw pile can also be used with a cast-in threaded rod.

When higher tensile strength is required, the pile can be reinforced with a steel threaded rod in the hollow core.

### Product specification

Name of ingredient	Share of total weight	Country of origin
Admixtures	0 - 2 %	Denmark
Cement	10 - 25 %	Germany
Metals and alloys	2 - 10 %	Denmark
Metals and alloys	2 - 10 %	Germany
Natural aggregates	50 - 80 %	Denmark
Supplementary materials	2 - 10 %	Denmark
Water	2 - 10 %	Denmark

### Technical data

	Unit	Value
Compressive Strength (Cylinder)	N / mm <sup>2</sup>	68.0
Density	kg / m <sup>3</sup>	2326.0
Surface exposed to air	m <sup>2</sup>	12.959
Total mass	kg	1762.03

### Market

Denmark

### Reference service life

100 years

## LCA: Calculation rules

### Functional unit

1 piece of Ø490 Screw Pile, complete, ex. splitter S15 Concrete

### Reference service life

100 years

### Data quality

The Emidat EPD Tool v1.0.0 was used for LCA modeling and calculation. Background data was used from ecoinvent database v3.10.

### System boundaries (X=included, MND=module not declared)

	Production			Installation		Use stage							End-of-Life				Next product system
	Raw material supply	Transport	Manufacturing	Transport	Installation Process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Demolition	Transport	Waste Processing	Disposal	Benefits and loads beyond the system boundary
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	x	x	x	x	x	x	MND	MND	MND	MND	MND	MND	x	x	x	x	x
Geography			DK	DK	DK	DK	MND	MND	MND	MND	MND	MND	DK	DK	DK	DK	DK

For the geographies modeled in A1 and A2, refer to *Product specification*.

Type of EPD: cradle to gate with options A4-A5, B1, C1-C4 and module D

#### Stage of Material Production and Construction

Module A1: Extraction and processing of raw materials

Module A2: Transportation of raw materials to the plant

Module A3: Precast concrete production at the plant and waste treatment

Module A4: Transportation to installation site

#### Use Stage

Module B1: Carbonation during the utilization phase

#### Disposal Stage

Module C1: Demolition/Dismantling

Module C2: Transportation of concrete demolition waste for processing

Module C3: Sorting of waste components and recycling of concrete and other contained components

Module C4: Landfilling of concrete and other contained components

#### Credits and burdens outside the system boundaries

Module D: Credits and burdens from recycling as a replacement for primary materials

### Cut-off criteria

Environmental impacts of the following processes are considered to be negligible: minor auxiliary materials used during installation (sealants, adhesives, or fasteners), minor water use for cleaning precast concrete elements .

### Allocation

Elementary flows (energy and fuels, ancillary materials and waste) data was collected on production-process-level. Using the total output of the production process in 2024, elementary flows are assigned to 1 declared unit based on mass.

## LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Transport to the building site (A4)	Value	Unit
Transported mass	1762.03	kg
Fuel consumption	3.93	L / 100 km
Average distance from manufacturer to construction site	200.00	km
Transport mode	truck	

Installation into the building (A5)	Value	Unit
Energy consumption: Diesel	76.12	MJ
Auxiliary materials: Lubricating oil	0.04	kg
Waste: Mineral oil	0.04	kg
Water consumption	-	kg
Formwork	-	kg
Falsework	-	kg

Installation-related material losses are considered negligible, as the precast concrete elements are delivered fully assembled from the factory. The energy consumption during installation is associated with the energy required by a crane to lift them into place. The crane is powered by generators driven by a diesel engine and an alternator. Assuming an average of 12 minutes of crane operating per tonne of precast concrete (2 to 5 minutes for lifting and positioning, and 7 to 10 minutes for installation and adjustments), we use the ecoinvent dataset 'machine operation, diesel, >= 18.64 kW and < 74.57 kW, steady-state (GLO)' to get the stated assumptions for A5.

Use of the installed product (B1)	Value	Unit
Reference use period	100.00	years
Application	Engineerings structures, in the ground	
Degree of carbonation (Dc)	0.85	-
Cement absorption factor	0.49	kg CO <sub>2</sub> / kg Cement
k-factor	0.50	mm / √year
Correction factor	1.00	-
Surface area of concrete	12.96	m <sup>2</sup>

Calculation of carbonization according to EN 16757. k-factor results from the concrete's compressive strength and its application. The cement absorption factor (maximum theoretical CO<sub>2</sub> uptake) depends on the average clinker content in cement. The correction factor results from cement substitutes in the recipe.

End of life (C1-C4)	Value	Unit
Diesel for deconstruction	-	kg

The product remains in the ground at its end-of-life.

## LCA: Results

### Core environmental impact indicators

Indicator	Unit	A1-3	A4	A5	B1	C1	C2	C3	C4	D
GWP-total	kg CO <sub>2</sub> -eq.	3.54e+02	3.65e+01	7.80e+00	-7.93e+00	0	0	0	0	0
GWP-fossil	kg CO <sub>2</sub> -eq.	3.53e+02	3.65e+01	7.80e+00	-7.93e+00	0	0	0	0	0
GWP-biogenic	kg CO <sub>2</sub> -eq.	8.61e-01	1.83e-02	9.47e-04	0	0	0	0	0	0
GWP-luluc	kg CO <sub>2</sub> -eq.	6.01e-02	1.30e-02	7.06e-04	0	0	0	0	0	0
ODP	kg CFC-11-Eq	4.06e-06	7.60e-07	1.20e-07	0	0	0	0	0	0
AP	mol H <sup>+</sup> -Eq	6.89e-01	8.62e-02	6.91e-02	0	0	0	0	0	0
EP-freshwater	kg P-Eq	4.98e-02	2.57e-03	2.43e-04	0	0	0	0	0	0
EP-marine	kg N-Eq	1.00e-01	2.26e-02	3.20e-02	0	0	0	0	0	0
EP-terrestrial	mol N-Eq	2.12e+00	2.44e-01	3.50e-01	0	0	0	0	0	0
POCP	kg NMVOC-Eq	6.57e-01	1.50e-01	1.05e-01	0	0	0	0	0	0
ADPE	kg Sb-Eq	4.59e-04	1.04e-04	3.30e-06	0	0	0	0	0	0
ADPF	MJ, net calorific value	1.93e+03	5.48e+02	1.02e+02	0	0	0	0	0	0
WDP	m <sup>3</sup> world Eq deprived	3.63e+01	2.75e+00	2.62e-01	0	0	0	0	0	0

**GWP-total:** Global Warming Potential - total **GWP-fossil:** Global warming potential - fossil **GWP-biogenic:** Global Warming Potential - biogenic **GWP-luluc:** Global Warming Potential - luluc **ODP:** Depletion potential of the stratospheric ozone layer **AP:** Acidification potential, Accumulated Exceedance **EP-freshwater:** Eutrophication potential - freshwater **EP-marine:** Eutrophication potential - marine **EP-terrestrial:** Eutrophication potential - terrestrial **POCP:** Photochemical Ozone Creation Potential **ADPE:** Abiotic depletion potential - non-fossil resources **ADPF:** Abiotic depletion potential - fossil resources **WDP:** Water (user) deprivation potential

### Additional indicators

Indicator	Unit	A1-3	A4	A5	B1	C1	C2	C3	C4	D
PM	disease incidence	ND	3.56e-06	1.96e-06	0	0	0	0	0	0
IRP	kBq U235-Eq	ND	6.66e-01	5.04e-02	0	0	0	0	0	0
ETP-fw	CTUe	ND	1.30e+02	1.44e+01	0	0	0	0	0	0
HTP-c	CTUh	ND	2.34e-07	3.01e-08	0	0	0	0	0	0
HTP-nc	CTUh	ND	3.61e-07	1.44e-08	0	0	0	0	0	0
SQP	dimensionless	ND	5.51e+02	7.23e+00	0	0	0	0	0	0

**PM:** Potential incidence of disease due to PM emissions **IRP:** Potential Human exposure efficiency relative to U235 **ETP-fw:** Potential Comparative Toxic Unit for ecosystems **HTP-c:** Potential Comparative Toxic Unit for humans - cancer effects **HTP-nc:** Potential Comparative Toxic Unit for humans - non-cancer effects **SQP:** Potential Soil quality index

**IRP:** 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.

**ETP-fw, HTP-c, HTP-nc and SQP:** 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 these indicators.

## Use of resources

Indicator	Unit	A1-3	A4	A5	B1	C1	C2	C3	C4	D
PERE	MJ	5.93e+02	8.69e+00	6.73e-01	0	0	0	0	0	0
PERM	MJ	0	0	0	0	0	0	0	0	0
PERT	MJ	5.93e+02	8.69e+00	6.73e-01	0	0	0	0	0	0
PENRE	MJ	1.99e+03	5.48e+02	1.02e+02	0	0	0	0	0	0
PENRM	MJ	6.79e+01	0	0	0	0	0	0	0	0
PENRT	MJ	2.06e+03	5.48e+02	1.02e+02	0	0	0	0	0	0
SM	kg	1.39e+02	0	0	0	0	0	0	0	0
RSF	MJ	2.94e+02	0	0	0	0	0	0	0	0
NRSF	MJ	7.29e+02	0	0	0	0	0	0	0	0
FW	m <sup>3</sup>	1.80e+00	7.96e-02	6.99e-03	0	0	0	0	0	0

**PERE:** Primary energy resources - renewable: use as energy carrier **PERM:** Primary energy resources - renewable: used as raw materials **PERT:** Primary energy resources - renewable: total **PENRE:** Primary energy resources - non-renewable: use as energy carrier **PENRM:** Primary energy resources - non-renewable: used as raw materials **PENRT:** Primary energy resources - non-renewable: total **SM:** Use of secondary material **RSF:** Renewable secondary fuels **NRSF:** Non-renewable secondary fuels **FW:** Net use of fresh water

## Waste flows

Indicator	Unit	A1-3	A4	A5	B1	C1	C2	C3	C4	D
HWD	kg	ND	7.96e-01	1.15e-01	0	0	0	0	0	0
NHWD	kg	ND	1.60e+01	1.60e+00	0	0	0	0	0	0
RWD	kg	ND	1.65e-04	1.24e-05	0	0	0	0	0	0

**HWD:** Hazardous waste disposed **NHWD:** Non hazardous waste disposed **RWD:** Radioactive waste disposed

## Output flows

Indicator	Unit	A1-3	A4	A5	B1	C1	C2	C3	C4	D
CRU	kg	0	0	0	0	0	0	0	0	0
MFR	kg	8.08e+01	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	0	0	0
EET	MJ	0	0	0	0	0	0	0	0	0

**CRU:** Components for re-use **MFR:** Materials for recycling **MER:** Materials for energy recovery **EEE:** Exported electrical energy **EET:** Exported thermal energy

Name	Value	Unit
Biogenic carbon content in product	0	kg C
Biogenic carbon content in accompanying packaging	0	kg C

## Additional requirements

### Greenhouse gas emissions from the use of electricity in the manufacturing phase

Electricity consumption in the manufacturing phase is composed from the source below certified by Guarantee of Origin. Electricity is represented by data in ecoinvent 3.10 regionalised for Denmark.

Electricity	Unit	Value
Wind	kg CO <sub>2</sub> -eq. / kWh	0.02

### Dangerous substances

The product contains no substances given by the REACH candidate list.

## Additional environmental information

### Additional environmental impact indicators required in NPCR Part A for construction products







Indicator	Unit	A1-3	A4	A5	B1	C1	C2	C3	C4	D
GWP-IOBC	kg CO <sub>2</sub> -eq.	ND	3.65e+01	7.80e+00	-7.93e+00	0	0	0	0	0

**GWP-IOBC:** Global Warming Potential - Instantaneous oxidation of biogenic carbon



## Bibliography

DIN EN ISO 14025:2011-10	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
DIN EN ISO 14040:2021-02	Environmental management - Life cycle assessment - Principles and framework
DIN EN ISO 14044:2021-02	Environmental management - Life cycle assessment - Requirements and guidelines
EN 15804:2012+A2:2019	Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
DIN CENTR 15941:2010-11	Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data
DIN EN 15942:2022-04	Sustainability of construction works - Environmental product declarations - Communication format business-to-business
ISO 21930:2017-07	Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services
Ecoinvent v3.10	ecoinvent, Zurich, Switzerland, database version 3.10
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	Basic principles and recommendations for describing the dismantling, post use, and disposal stage of construction products: <a href="https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2020-07-06_texte_130-2020_guidance-document-construction-industry.pdf">https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2020-07-06_texte_130-2020_guidance-document-construction-industry.pdf</a>
	ILCD Handbook: <a href="https://epica.jrc.ec.europa.eu/uploads/ILCD-Handbook-LCIA-Background-analysis-online-12March2010.pdf">https://epica.jrc.ec.europa.eu/uploads/ILCD-Handbook-LCIA-Background-analysis-online-12March2010.pdf</a>

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