

# Environmental Product Declaration



In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019 for:

## Steel core piles

from

**UAB Scandia Steel Baltic**



Programme:	The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a>
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*An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at [www.environdec.com](http://www.environdec.com)*



## General information

### Programme information

<b>Programme:</b>	The International EPD® System
<b>Address:</b>	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
<b>Website:</b>	<a href="http://www.environdec.com">www.environdec.com</a>
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### Accountabilities for PCR, LCA and independent, third-party verification

#### Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): *PCR 2019:14 Construction products, version 1.2.5*

PCR review was conducted by: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat [www.environdec.com/contact](http://www.environdec.com/contact).

#### Life Cycle Assessment (LCA)

LCA accountability: Tyréns Sweden AB

#### Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

EPD verification by individual verifier

Third-party verifier: *Dr Hudai Kara, Metsims Sustainability Consulting, [www.metsims.com](http://www.metsims.com), Oxford, U.K.*

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes       No

The EPD owner 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. For further information about comparability, see EN 15804 and ISO 14025.

## Company information

Owner of the EPD: Scandia Steel Sweden AB

Contact: Markus Eriksson

Description of the organisation: Scandia Steel is a leading supplier of steel piling piles. Our piles are supplied to the Scandinavian building industry and used by well-known construction companies.

Product-related or management system-related certifications: ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, EN 1090-1:2009+A1:2012, EN ISO 3834-2:2006, EN 10025-1, EN 10060, EN 1993-5, EN ISO 5817, EN ISO 4063, EN 13501-1:2007+A1:2010.

## Product information

Product name: Steel core piles

Product description: Steel core piles are round bars of solid steel that are drilled into the ground in combination with steel tubes. The space between pipe and the steel core pile is filled up with concrete. The steel core piles are offered in sizes from 70mm to 230mm. The steel core piles consist of 100% steel. The steel grade used for the steel core piles are S355J2H.

UN CPC code: 41244

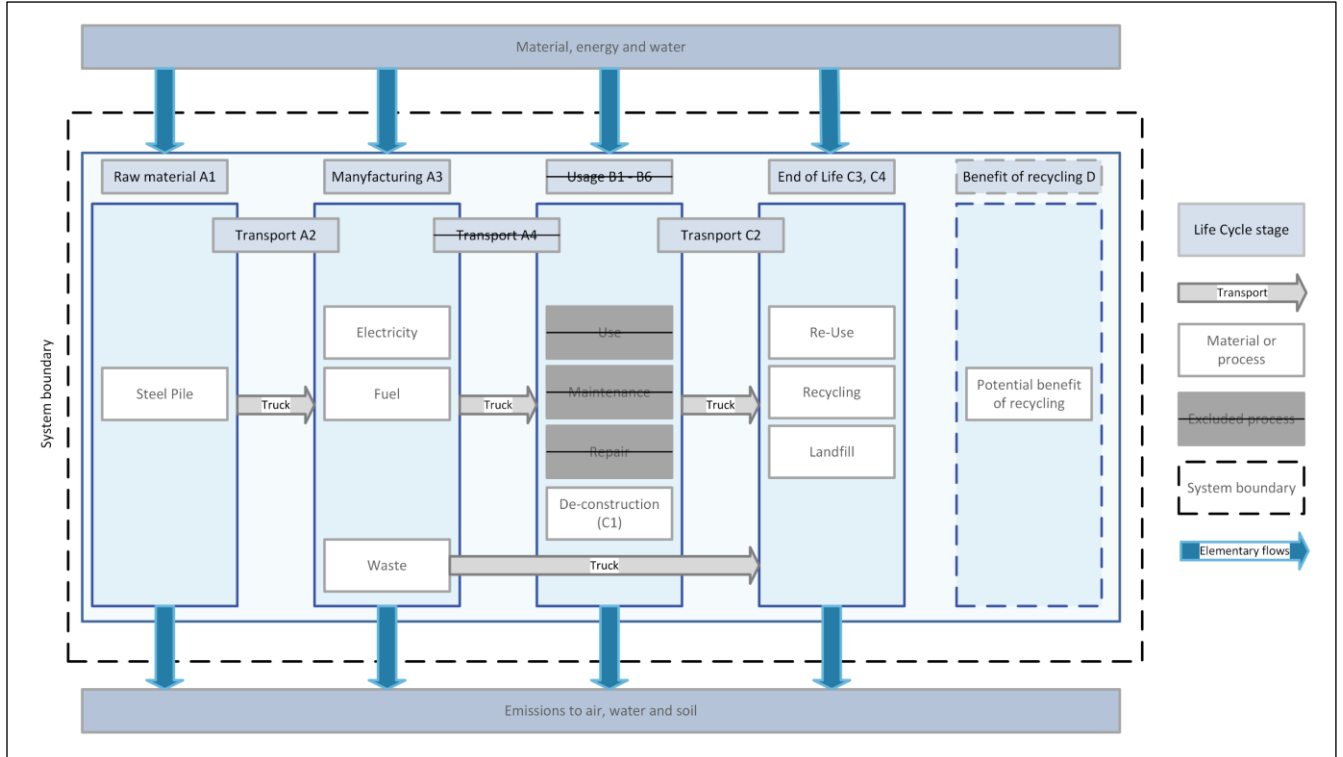
## LCA information

<b>Declared unit</b>	1 tonne of Steel core piles
<b>Reference service life</b>	Not applicable
<b>Time representativeness</b>	For specific data the reference year is 2022
<b>Database(s) and LCA software used</b>	The software SimaPro 9.4.0.2 was used during the completion of this study. All background data comes from Ecoinvent 3.8.
<b>Description of system boundaries</b>	Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D).
<b>Manufacturing site</b>	UAB Scandia Steel Baltic Vytauto 151 97133 Kretinga Lithuania
<b>Geographical scope</b>	Europe
<b>Compliant with</b>	This EPD follow the “Book-keeping“ LCA approach which is defined as attributional LCA in the ISO 14040 standard.  In accordance with ISO 14025 and EN 15804:2012+A2:2019 PCR 2019:14 Construction products, version 1.2.5
<b>Cut-Off rules</b>	For this LCA study a 1 % cut off rule was applied.
<b>Allocations</b>	Polluter Pays / Allocation by Classification  Two allocation rules are applied:  1) the raw material necessary for the manufacture is allocated by mass of the declared unit  2) the energy necessary for the manufacture is allocated in MJ by production of the declared unit
<b>Electricity data</b>	Electricity consumption in the A3 module comes from 100% renewable energy by wind power.

Products contain no substances in the REACH Candidate list. Products contain no substances in the Norwegian priority list.

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.

**System diagram:**



Included	Excluded
<b>Production (A1-A3)</b> <ul style="list-style-type: none"> <li>Raw materials and production and processing of raw materials</li> <li>Transport of raw materials to Scandia Steel's factory in Lithuania</li> <li>Energy use in Scandia Steel's factory in Lithuania</li> <li>Production and treatment of material that becomes waste in the manufacturing process by, for example, cutting or turning.</li> <li>Production of packaging material</li> <li>Transport of recyclable waste material to recycling facilities</li> </ul>	<b>Production (A1-A3)</b> <ul style="list-style-type: none"> <li>The packaging materials in A2.</li> <li>Factory infrastructure and machinery.</li> </ul>
	Installation (A4-A5)
	Use phase (B1-B7)
<b>End of life (C1-C4)</b> <ul style="list-style-type: none"> <li>Disassembly of steel core pile and transportation to waste management facilities.</li> </ul>	
<b>Benefits and loads beyond the system boundary (D)</b> <ul style="list-style-type: none"> <li>Steel recycling</li> </ul>	

#### Main assumptions

- All transport in A2 is made by EURO V trucks.
- Steel suppliers have not provided detailed information about their specific route of steel processing. It is assumed that all suppliers use the hot rolling process,
- For suppliers with a high recycling's range, above 90%, the steel mill is assumed to be electric arc furnace (EAF). For the suppliers with a lower recycling range the steel mill is assumed to be a basic oxidation furnace (BOF), i.e., converter.
- Scandia Steel factory infrastructure is not considered in the study.
- It is assumed that a diesel-powered machinery is used for deconstruction of steel core pile. The diesel-powered machine is assumed to use 85 kWh per tonne product.
- Transport distance of dismantled pile (module C2) is assumed to be 50 km
- It is assumed that 92% of the product can be recycled, in C3, and 8% is landfilled, in C4.

LCA practitioners: Xenofon Lemperos, Ida Bohlin and Ida Adolfsson at Tyréns Sverige AB

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation:

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	PL	Euro V	LT	ND	ND	ND	ND	ND	ND	ND	ND	ND	SE	SE	SE	SE	SE
Specific data used	>90%			ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	Not relevant			ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant			ND	ND	-	-	-	-	-	-	-	-	-	-	-	-

## Content information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Steel core pile	1000	32.2	0
TOTAL	1000	32.2	0
Packaging materials	Weight, kg	Weight-% (versus the product)	
Wood	1	0.1	
Steel strips	0,2	0.02	
Film	0,1	0.01	
TOTAL	1.3	0.13	

The steel piles do not contain substances which exceed the limits for registration with the European Chemicals Agency regarding the “Candidate List of Substances of Very High Concern for Authorization”.

## Results of the environmental performance indicators

### Mandatory impact category indicators according to EN 15804

Results for 1 tonne of Steel core piles										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO <sub>2</sub> eq.	2.20E+03	1.56E+02	5.09E+00	2.36E+03	2.81E+01	4.15E+00	3.77E+00	4.29E-01	-1.01E+03
GWP-biogenic	kg CO <sub>2</sub> eq.	1.97E+01	4.13E-01	-2.03E+00	1.81E+01	2.43E-02	1.10E-02	6.71E-02	1.51E-03	3.95E+00
GWP-luluc	kg CO <sub>2</sub> eq.	9.14E-01	6.13E-02	3.59E-03	9.79E-01	2.81E-03	1.63E-03	3.68E-03	4.05E-04	-2.64E-01
GWP-total	kg CO <sub>2</sub> eq.	2.22E+03	1.57E+02	3.06E+00	2.38E+03	2.82E+01	4.17E+00	3.84E+00	4.31E-01	-1.00E+03
ODP	kg CFC 11 eq.	9.69E-05	3.62E-05	9.07E-07	1.34E-04	6.01E-06	9.62E-07	6.75E-07	1.74E-07	-4.05E-05
AP	mol H <sup>+</sup> eq.	1.00E+01	6.34E-01	4.33E-02	1.07E+01	2.92E-01	1.69E-02	2.30E-02	4.04E-03	-3.55E+00
EP-freshwater	kg P eq.	1.24E+00	1.01E-02	7.44E-04	1.25E+00	8.72E-04	2.68E-04	1.19E-03	3.93E-05	-3.91E-01
EP-marine	kg N eq.	2.03E+00	1.91E-01	1.72E-02	2.24E+00	1.30E-01	5.08E-03	7.41E-03	1.40E-03	-8.51E-01
EP-terrestrial	mol N eq.	2.11E+01	2.09E+00	1.87E-01	2.33E+01	1.42E+00	5.55E-02	7.91E-02	1.54E-02	-9.02E+00
POCP	kg NMVOC eq.	9.36E+00	6.39E-01	5.56E-02	1.01E+01	3.90E-01	1.70E-02	2.24E-02	4.47E-03	-5.02E+00
ADP-minerals&metals*	kg Sb eq.	2.76E-02	5.43E-04	4.61E-05	2.82E-02	1.45E-05	1.44E-05	1.89E-05	9.79E-07	9.67E-04
ADP-fossil*	MJ	2.28E+04	2.36E+03	7.48E+01	2.52E+04	3.86E+02	6.28E+01	6.22E+01	1.20E+01	-1.02E+04
WDP	m <sup>3</sup>	4.50E+02	6.85E+00	6.38E-01	4.57E+02	5.50E-01	1.82E-01	3.93E-01	5.39E-01	-5.02E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption									

\* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.



## Additional mandatory and voluntary impact category indicators

Results for 1 tonne of Steel core piles										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-GHG <sup>1</sup>	kg CO <sub>2</sub> eq.	2.12E+03	1.55E+02	5.00E+00	2.28E+03	2.78E+01	4.12E+00	3.73E+00	4.21E-01	-9.57E+02

## Resource use indicators

Results for 1 tonne of Steel core piles										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
PERE	MJ	2.08E+03	3.33E+01	1.19E+02	2.23E+03	2.17E+00	8.85E-01	4.66E+00	1.02E-01	-1.82E+02
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	2.08E+03	3.33E+01	1.19E+02	2.23E+03	2.17E+00	8.85E-01	4.66E+00	1.02E-01	-1.82E+02
PENRE	MJ	2.42E+04	2.51E+03	7.96E+01	2.68E+04	4.10E+02	6.67E+01	6.58E+01	1.27E+01	-1.07E+04
PENRM	MJ.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	2.42E+04	2.51E+03	7.96E+01	2.68E+04	4.10E+02	6.67E+01	6.58E+01	1.27E+01	-1.07E+04
SM	kg	3.22E+02	0.00E+00	0.00E+00	3.22E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m <sup>3</sup>	1.11E+01	3.96E-01	1.51E-02	1.15E+01	3.46E-02	1.05E-02	1.48E-02	1.31E-02	-3.40E+00
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

<sup>1</sup> The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

## Waste indicators

Results for 1 tonne of Steel core piles										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## Output flow indicators

Results for 1 tonne of Steel core piles										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	0.00E+00	0.00E+00	1.80E+01	1.80E+01	0.00E+00	0.00E+00	9.20E+02	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	7.80E-02	7.80E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## Information on biogenic carbon content

Results for 1 tonne of Steel core piles		
BIOGENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0.431

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>.

## Additional information

### A4 transport

A4 transport has been modelled for 10 km transport by truck and 10 km transport by sea:

Results per 1 tonne final product			
A4			
Impact category	Unit	Transport by truck	Transport by sea
GWP-total	kg CO2 eq / ton*10 km	8.72E-01	9.42E-02
GWP-GHG	kg CO2 eq / ton*10 km	8.63E-01	9.36E-02

### Differences versus previous versions

This EPD is an update of the expired EPD S-P-00904 “Steel Core Piles UAB Scandia Steel Baltic”. The declared unit has remained the same (1 tonne final product), but the composition of steel suppliers changed with new data for 2022. This EPD has less proportion of recycled steel material due to change in the supply chain. The post-consumer recycled material in the final product changed from 77.4% to 32.2%.

As a result, the environmental performance for fossil global warming potential increased with 132% from 1016 kg CO<sub>2</sub> eq./tonne product to 2360 kg CO<sub>2</sub> eq./tonne product.

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