Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 for:

Pile joints

from

Leimet Oy

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-05366
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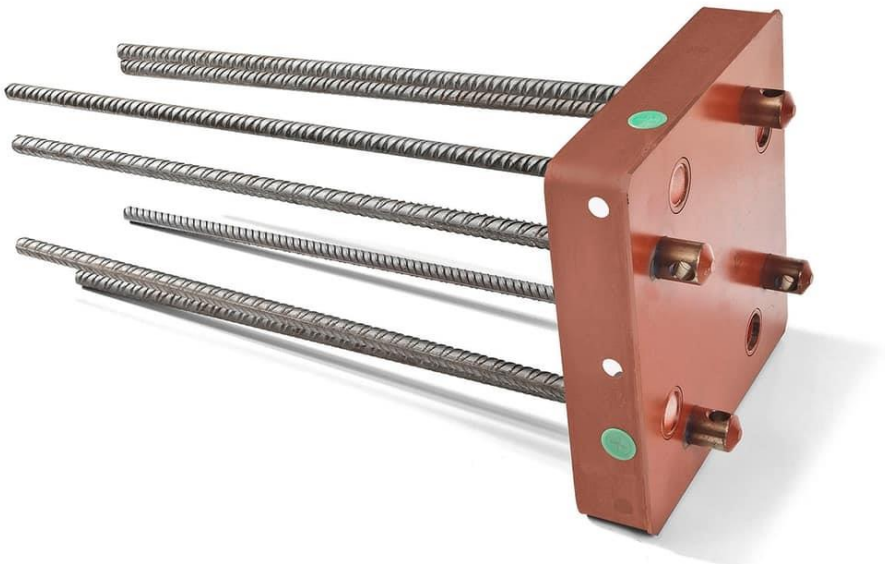


Programme information

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com

Product category rules (PCR): Construction Products and Construction Services, 2012:01, version 2.33. UN CPC code: 412.
PCR review was conducted by: Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via info@environdec.com
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: Hannu Karppi, Ramboll Finland Oy   *In case of recognised individual verifiers:* 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 programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.

Company information

Owner of the EPD:
Teemu Tupala, Leimet Oy
teemu.tupala@leimet.fi, www.leimet.fi

Description of the organisation: Leimet Oy is a Finnish family-owned company, a key player in a large variety of piling projects all over the world. Our core business is the development, manufacturing and marketing of pile joints and rock points for precast concrete piles for pile producers around the world. We also manufacture components for steel tube piles, like hardened top pins for rocky soils and joints for timber piles. Leimet has certified ISO 9001:2015 quality system and continuous quality control with Eurofins Expert Services.

Name and location of production site: Yrittäjäntie 7, 27230 Lappi, Finland

Product information

Product name: Pile joint manufactured by Leimet Oy

Product identification: Pile joint for precast concrete piles.

Product description: Pile joints are used to join precast reinforced concrete piles while providing high bending
moment strength.

UN CPC code: 412

Geographical scope: Europe

LCA information

Functional unit / declared unit: 1 kg of product

Reference service life: N/A

Time representativeness: Data for the calculation was collected for production year 2018 describing annual production.

Database(s) and LCA software used: Ecoinvent 3.7 database was used for the calculation. SimaPro version 9.2.0.2 was used for the modelling.

System diagram:

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
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	ND	ND	ND	ND	ND

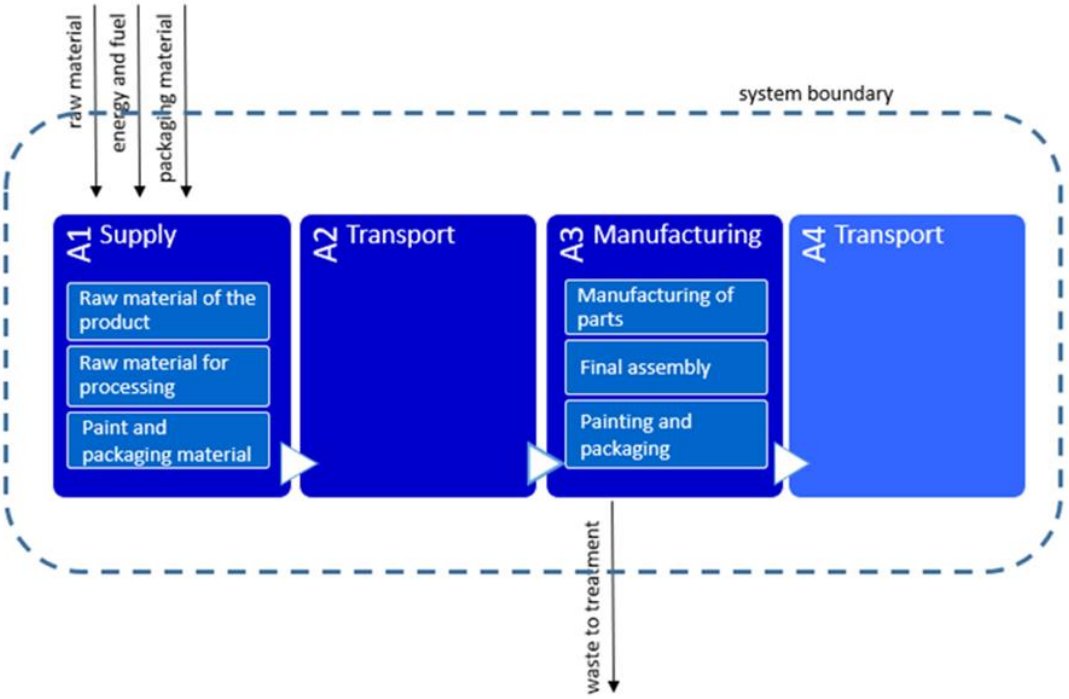
Description of system boundaries: Cradle-to-gate with options (A1-A4)

Excluded lifecycle stages: Modules A5, B1-B7, C1-C4, and D are not assessed.

LCA practitioner: Ecobio Oy, info@ecobio.fi

Cut-off rule: 1% cut-off rule was applied for input flows in the inventory. The material used is as up-to-date as possible and at most five years old for producer specific data and at most ten years old for generic data.

Flow chart describing the product system:



Content declaration

Product

Materials / chemical substances	Mass [kg]	%	Environmental / hazardous properties
Steel, unalloyed	43,00	43,00	N/A
Steel, low-alloyed	6,00	6,00	N/A
Reinforcing steel	50,00	50,00	N/A
Paint	0,04	0,04	N/A
Plastic (LDPE)	0,07	0,07	N/A

The shares of materials are declared per 1 kg of product.

The total average weight of a pair of pile joint is 35,4 kg.

For construction product EPDs compliant with EN 15804, the content declaration shall list, as a minimum, substances contained in the products that are listed in the “Candidate List of Substances of Very High Concern for Authorisation” when their content exceeds the limits for registration with the European Chemicals Agency.

The pile joints 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 Authorisation”.

Packaging

Distribution packaging: The pile joints are packed with wood and plastic. The plastic parts used in product packaging and as protection are made of low-density polyethene (LDPE), either primary LDPE (25%) or secondary LDPE (25%). In-coming raw materials are packed with wood, cardboard and metal. Wood packaging materials are recycled, and the waste treatment of wood packaging is incineration. The waste treatment of metal wire is recycling, that of the metal bucket is landfilling, and that of the cardboard is recycling.

Consumer packaging: There is no information available regarding the consumer packaging as the pile joints are headed to pile foundry after the manufacturing stage. The product is headed to construction site as part of a pile product later.

Recycled material

Provenience of recycled materials (pre-consumer or post-consumer) in the product: The pile joints can be made from either primary or secondary material. The EPD includes the steel raw material as defined in the ecoinvent 3.7 database as well as pre-consumer and post-consumer contents of applied EPDs for manufacturer specific information.

Environmental performance

Potential environmental impact – Pile joints, per 1 kg of product

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4
Global Warming (GWP)	kg CO_2 eq.	9,37E-01	1,01E-01	5,08E-02	1,09E+00	1,65E-01
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 eq.	4,16E-08	1,80E-08	3,58E-09	6,32E-08	2,83E-08
Acidification potential (AP)	kg SO_2 eq.	4,47E-03	6,42E-04	1,50E-03	6,61E-03	2,54E-03
Eutrophication potential (EP)	kg PO_4^{3-} eq.	1,18E-03	9,50E-05	4,07E-04	1,68E-03	3,00E-04
Formation potential of tropospheric ozone (POCP)	kg C_2H_4 eq.	1,45E-03	2,03E-05	9,03E-06	1,48E-03	6,78E-05
Abiotic depletion potential – Elements	kg Sb eq.	3,27E-06	3,32E-07	2,08E-07	3,81E-06	3,91E-07
Abiotic depletion potential – Fossil resources	MJ, net calorific value	8,31E+00	1,48E+00	5,85E-01	1,04E+01	2,29E+00

Use of resources – Pile joints, per 1 kg of product (unit MJ, net calorific value)

PARAMETER		UNIT	A1	A2	A3	TOTAL A1-A3	A4
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	2,70E+00	1,89E-02	4,63E-01	3,18E+00	2,29E-02
	Used as raw materials	MJ, net calorific value	2,69E-02	0,00E+00	3,14E-02	5,83E-02	0,00E+00
	TOTAL	MJ, net calorific value	2,73E+00	1,89E-02	4,94E-01	3,24E+00	2,29E-02
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	1,24E+01	1,51E+00	1,63E+00	1,55E+01	2,32E+00
	Used as raw materials	MJ, net calorific value	9,00E-05	0,00E+00	0,00E+00	9,00E-05	0,00E+00
	TOTAL	MJ, net calorific value	1,24E+01	1,51E+00	1,63E+00	1,55E+01	2,32E+00
Secondary material		kg	2,53E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Renewable secondary fuels		MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-renewable secondary fuels		MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Net use of fresh water		m^3	3,36E-02	1,41E-04	1,31E-03	3,50E-02	1,70E-04

Waste production and output flows

Waste production – Pile joints, per 1 kg of product

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4
Hazardous waste disposed	kg	1,41E-03	3,60E-06	8,19E-07	1,42E-03	4,09E-06
Non-hazardous waste disposed	kg	2,62E-01	6,38E-02	7,23E-03	3,33E-01	6,00E-02
Radioactive waste disposed	kg	4,00E-05	1,03E-05	1,52E-05	6,56E-05	1,61E-05

Output flows – Pile joints, per 1 kg of product

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4
Components for reuse	kg	0	0	0	0	0
Material for recycling	kg	0	0	0,0830	0,0830	0
Materials for energy recovery	kg	0	0	0,0052	0,0052	0
Exported energy, electricity	MJ	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0

Additional information – Scenarios

Transport to construction site (A4)

The pile joints are transported to the construction site by road and by sea. The transportation in module A4 does not describe actual transportation to construction, but to pile foundry. The transportation to construction site takes places further in the future with pile joints being as part of pile products. The road transport was estimated to be conducted mainly by trucks.

Parameter	Unit
Vehicle type	Lorry, 16-32 metric ton
Load capacity	37 % (ecoinvent 3.7)
Distance	479 km
Bulk density	515 kg/m3

Parameter	Unit
Vehicle type	Ferry
Load capacity	65 % (ecoinvent 3.7)
Distance	799 km
Bulk density	515 kg/m3

References

General Programme Instructions of the International EPD® System. Version 3.0.
PCR 2021:01. Construction products and construction services. Version 2.33.
LCA Report – Leimet Oy's pile joints and rock points. 2021.

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