ENVIRONMENTAL PRODUCT DECLARATION

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

PETRA® GREEN

PEIKKO GROUP

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	Peikko Finland Oy
Address	Voimakatu 3, P.O. Box 104, 15170 Lahti, Finland
Contact details	Jaakko Yrjölä +358 40 712 3400 jaakko.yrjola@peikko.com
Website	www.peikko.com

PRODUCT IDENTIFICATION

Product name	PETRA® Green, painted
Place(s) of production	Finland

Kai Renholm

RTS EPD Committee secretary

Laura Apilo

Managing Director

EPD INFORMATION

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 program operator	Rakennustietosäätiö RTS sr / Rakennustieto Oy Malminkatu 16 A, PL 1004, 00101 Helsinki cer.rts.fi
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804+A2 serves as the core PCR. In addition, RTS PCR (Finnish version, 1.6.2020) is used.
EPD author	Jaakko Yrjölä, Peikko Group
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
Verification date	05.03.2021
EPD verifier	Anni Oviir, Rangi Maja OÜ www.lcasupport.com
EPD number	RTS_106_21
Publishing date	11.3.2021
EPD valid until	05.09.2022

PRODUCT INFORMATION

PRODUCT DESCRIPTION

This EPD represents painted PETRA® Green produced at Peikko facility in Lahti, Finland. This is the new version of PETRA®, which includes increased use of recycled material. Since the production of PETRA® Green was not yet started at the time this EPD was created, EPD has been calculated based on its sibling product PETRA®. The production impacts of PETRA® Green can be considered as identical with PETRA®.

PRODUCT APPLICATION

PETRA® Green Slab Hanger is used to support hollow-core slabs and make openings and configurations into hollow-core slab floors. PETRA® Green is a unique technical solution that has all the benefits of a standardized product, while being used for applications that usually require careful static analyses and tailor-made structural solutions.

TECHNICAL SPECIFICATIONS

PETRA® Green consists of a L-shaped steel front plate welded together with side plates. PETRA® Green is usually hanged on two parallel hollow core slabs and one or more slabs are supported by the front plate. PETRA® Green is designed to support slabs during assembly phase, in normal use and in fire situations without the need for temporary supports or propping. These EPD calculations do not cover concrete used at the construction site. PETRA® Green is available in several standard models that are pre-dimensioned so that their shape and resistances fit with the properties of most of the hollow-core slabs available on the European market.

PRODUCT STANDARDS

PETRA® Green, painted is CE marked through harmonized standard EN 1090-1.

PHYSICAL PROPERTIES OF THE PRODUCT

Detailed technical information can be found from manufacturers webpages at https://www.peikko.com/products/product/petra-slab-hanger/.

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at www.peikko.com.

PRODUCT RAW MATERIAL COMPOSITION

Material	Amount %	Usability			Origin of the raw materials
		Renewable	Non-renewable	Recycled	
Steel plate	93.6		x	x	Europe
Rebar	6.1		x	x	Europe
Welding filler metal	< 1		x		Europe
Paint	< 1		x		Europe

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	100	Europe
Minerals	0	-
Fossil materials	0	-
Bio-based materials	0	-

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

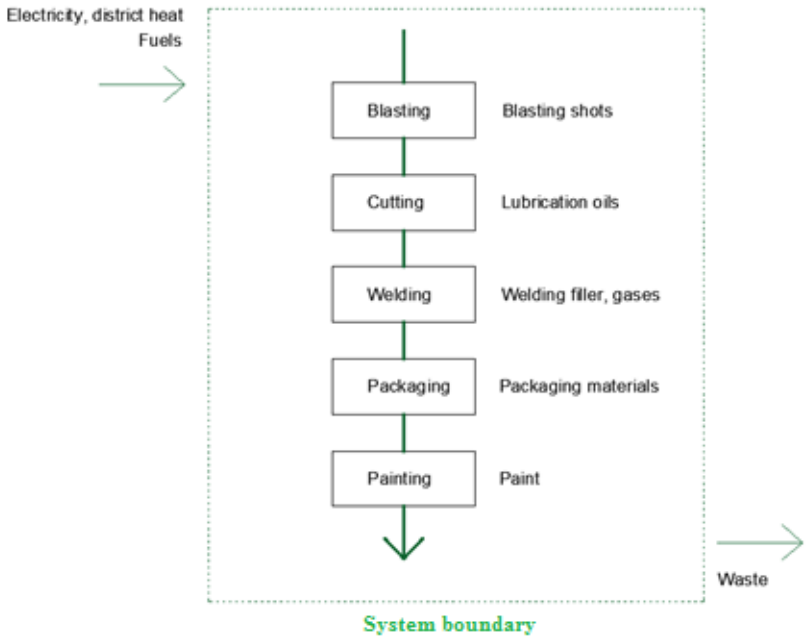
MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts of raw material supply (A1) include emissions generated when raw materials are taken from nature, transported to industrial unit for processing and processed, along with waste handling from the production processes. All major upstream processes are taken into account, including infrastructure. Loss of raw material and energy transmission losses are also considered. This stage includes all the aforementioned for the raw materials which end up in the final product (i.e. steel, welding filler, packaging) as well as the electricity and heat production which are consumed during the manufacturing at the factory. The only relevant secondary material used in the production supply is steel scrap.

The considered transportation impacts (A2) include exhaust emissions resulting from the transport of all raw materials from suppliers to Peikko Finland production plant as well as the environmental impacts of production of the used diesel. The manufacturing, maintenance and disposal of the vehicles as well as tire and road wear during transportation have also been included. The transportation distances and methods were provided by Peikko Finland Oy.

The environmental impacts considered for the production stage (A3) cover the manufacturing of the production materials (welding gases and blasting steel shots) and fuels used by machines, as well as handling of waste formed in the production processes at the factory.

The environmental impacts of this stage were calculated on the basis of factory data provided by Peikko. The study considers the losses of main raw materials occurring during the manufacturing process.



TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. The transportation distance is defined according to RTS PCR, thus need for PETRA® Green is taking place in Helsinki.

Therefore, the transportation distance from the factory (Lahti) to construction site (Helsinki) is assumed as 110 km and the transportation method is assumed to be lorry. Transportation is not expected to cause losses as products are packaged properly.

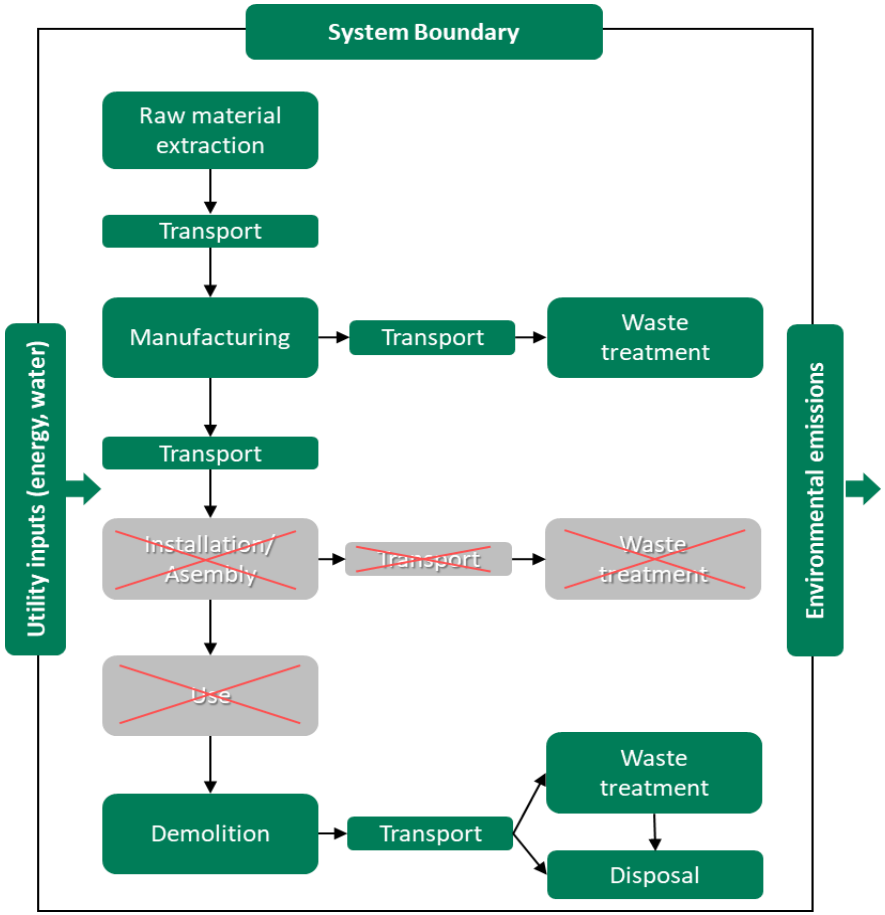
PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover use phase. Impacts of air, soil and water during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

End of life stage includes deconstruction/demolition (C1), transport to waste processing (C2), waste processing for reuse, recovery and/or recycling (C3) and disposal (C4). Demolition is assumed to take 0.01 kWh/kg of element. It is assumed that 100% of waste is collected. Distance for transportation to treatment is assumed as 50 km and the transportation method is assumed to be lorry. This is an average distance which considers the fact that according to the scenario A4 products are situated in Finland and distance to recycling and landfill is not very long. 95% of steel is assumed to be recycled based on World Steel Association, 2020. It is assumed that 5% of steel is taken to landfill for final disposal. Due to the recycling process the end-of-life product is converted into a recycled steel.

Life cycle stages diagram:



LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	Calendar year 2019

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 kg

MASS TABLE FOR PRODUCT VARIATIONS

PRODUCT SIZE	MASS PER UNIT LENGTH
PETRA 200	15.3 kg/m
PETRA 265	19.4 kg/m
PETRA 320	22.4 kg/m
PETRA 370	24.5 kg/m
PETRA 400	34.7 kg/m
PETRA 500	41.8 kg/m

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	0,01*

*No significant amount of biogenic carbon – neglected in LCA calculations.

SYSTEM BOUNDARY

This EPD covers "cradle to gate with options, modules C1-C4 and D" scope with the following modules; 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	x	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.

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the EN 15804+A2:2019 and RTS PCR. Modules, which are excluded from LCA analysis are A5 and B1-B7. 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 which data are available for are included in 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. Processes excluded from the assessment and the related cut-off criteria are provided in table below.

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

Since the plant produces more than one product and raw material and energy consumption data is not collected separately for each product, data is allocated. Allocation is based on annual production rate of PETRA® and made with high accuracy and precision.

The values for 1 kg of the product, which is used within the study, are calculated by considering the total production output (kg) for the product per annual production output (kg) of the plant. In the factory, more than one kind of product are produced; since the production processes of these products are similar, the annual production output percentages are taken into consideration for allocation. According to the ratio of the annual production output of the declared product to the total annual production output at the factory, the annual total energy consumption, packaging materials and the generated waste per the declared product are allocated. Subsequently, the product output fixed to 1 kg and the corresponding amount of product is used in calculations.

ESTIMATIONS AND ASSUMPTIONS

This LCA study is conducted in accordance with 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 A2, A4 & C2: Vehicle capacity utilization factor is assumed to be 1, which means fully loaded lorries. It may vary in reality, but since the impact of the transportation emissions to the total results is small, variety in load is assumed to be negligible. Returns without delivered load are not taken into account as it is assumed that return trip is used by transportation company to serve needs of other client

• Module A4: The transportation distance is defined according to RTS PCR. It was assumed that typical construction site is situated in the district of the production plant. The transportation distance from manufacturing plant to construction site in Helsinki is assumed as 110 km and the transportation method is assumed to be lorry. According to producer, transportation doesn't cause losses as products are packaged properly. Also, volume capacity utilization factor is assumed to be 1 for the packaged products.

• Module C1: Energy consumption of demolition process is on the average 10 kWh/m2 (Bozdag, Ö. & Secer, M. 2007). Based on Level(s) project, an average mass of concrete building is about 1000 kg/m2. Thus, energy consumption of demolition is 10 kWh / 1000 kg = 0.01 kWh/kg.

• 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 50 km and the transportation method is assumed as lorry, which is the most common.

• Module C3: 95% of steel (World Steel Association. 2020) is recycled.

• Module C4: The remaining 5% of steel is assumed to be landfilled.

• Module D: Benefits of recyclable waste generated in the Module C3 are considered in the Module D. The recycled steel has been modelled to avoid use of virgin steel in steel profiles production. The scrap content in the studied products has been acknowledged and only the mass of virgin steel in the product provides the benefit in order to avoid double counting. The scrap content of the raw materials is the following: Steel plate 98.3%, rebar 97%

ENVIRONMENTAL IMPACT DATA

Note: "ENVIRONMENTAL IMPACTS - EN 15804+A1, CML / ISO 21930" and "ENVIRONMENTAL IMPACTS - TRACI 2.1" are presented in ANNEX.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change – total	kg CO2e	6,2E−1	2,93E−1	1,21E−1	1,03E0	9,5E−3	MND	MND	3,3E−3	4,36E−3	5,45E−2	2,64E−4	−2,87E−2
Climate change – fossil	kg CO2e	6,21E−1	2,93E−1	1,2E−1	1,03E0	9,58E−3	MND	MND	3,3E−3	4,35E−3	5,45E−2	2,63E−4	−2,89E−2
Climate change – biogenic	kg CO2e	-2,09E−3	8,73E−6	3,9E−4	-1,69E−3	2,85E−7	MND	MND	2,42E−7	1,3E−7	4E−6	3,61E−7	1,45E−4
Climate change – LULUC	kg CO2e	7,39E−4	9,21E−5	7,93E−4	1,62E−3	3,01E−6	MND	MND	2,79E−7	1,37E−6	4,6E−6	7,82E−8	7,99E−7
Ozone depletion	kg CFC11e	6,36E−8	7,2E−8	1,74E−8	1,53E−7	2,35E−9	MND	MND	7,12E−10	1,07E−9	1,18E−8	1,08E−10	−7,68E−10
Acidification	mol H+e	2,87E−3	7,19E−4	3,92E−4	3,98E−3	2,35E−5	MND	MND	5,64E−6	1,07E−5	9,31E−5	1,24E−6	−1,04E−4
Eutrophication, aquatic freshwater	kg PO4e	4,23E−4	2,18E−5	3,93E−5	4,84E−4	7,13E−7	MND	MND	1,2E−7	3,24E−7	1,98E−6	2,73E−8	−1,23E−5
Eutrophication, aquatic marine	kg Ne	5,52E−4	1,03E−4	7,61E−5	7,31E−4	3,36E−6	MND	MND	7,58E−7	1,53E−6	1,25E−5	2,43E−7	−2,18E−5
Eutrophication, terrestrial	mol Ne	5,52E−3	1,1E−3	8,05E−4	7,42E−3	3,59E−5	MND	MND	8,11E−6	1,63E−5	1,34E−4	2,64E−6	−2,08E−4
Photochemical ozone formation	kg NMVOCe	1,76E−3	6,05E−4	2,3E−4	2,6E−3	1,98E−5	MND	MND	8,07E−6	8,99E−6	1,33E−4	1,08E−6	−1,17E−4
Abiotic depletion, minerals &	kg Sbe	8,82E−6	5,22E−6	3,19E−7	1,44E−5	1,71E−7	MND	MND	5,03E−9	7,75E−8	8,32E−8	2,41E−9	−2,87E−8
Abiotic depletion of fossil	MJ	9,89E0	4,71E0	1,57E0	1,62E1	1,54E−1	MND	MND	4,48E−2	6,99E−2	7,4E−1	7,33E−3	−3,57E−1
Water use	m3e depr.	8,69E1	3,65E0	1,16E2	2,06E2	1,19E−1	MND	MND	9,62E−3	5,42E−2	1,59E−1	2,27E−3	9,1E−1

EN 15804+A2 disclaimer for Abiotic depletion and Water use indicators and all 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.

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	Incidence	7,57E−8	2,52E−8	5,43E−9	1,06E−7	8,22E−10	MND	MND	8,45E−10	3,74E−10	1,4E−8	4,55E−11	−2E−9
Ionizing radiation, human health	kBq U235e	1,52E−1	2,42E−2	1,25E−1	3,01E−1	7,93E−4	MND	MND	2,06E−4	3,6E−4	3,4E−3	3,29E−5	1,29E−3
Eco-toxicity (freshwater)	CTUe	3,16E−1	2E−1	7,77E−3	5,24E−1	6,55E−3	MND	MND	2,48E−4	2,98E−3	4,1E−3	4,57E−5	1,23E−3
Human toxicity, cancer effects	CTUh	8,16E−9	8,47E−11	3,25E−11	8,28E−9	2,77E−12	MND	MND	8,77E−13	1,26E−12	1,45E−11	1,02E−13	−5,61E−11
Human toxicity, non-cancer effects	CTUh	5,01E−7	5,74E−9	4,42E−9	5,12E−7	1,88E−10	MND	MND	1,85E−11	8,52E−11	3,05E−10	3,87E−12	7,21E−9
Land use related impacts/soil quality	-	1,54E0	7,1E0	1,03E−1	8,75E0	2,32E−1	MND	MND	1E−3	1,06E−1	1,65E−2	1,25E−2	−4,99E−2

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-B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	1,08E0	5,99E−2	7,3E−1	1,87E0	1,96E−3	MND	MND	2,45E-4	8,9E−4	4,05E-3	5,95E-5	2,83E-3
Renewable PER used as materials	MJ	0E0	0E0	0E0	0E0	0E0	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renewable PER	MJ	1,08E0	5,99E−2	7,3E−1	1,87E0	1,96E−3	MND	MND	2,45E−4	8,9E−4	4,05E−3	5,95E−5	2,83E-3
Non-renew. PER used as energy	MJ	1,24E1	4,8E0	3,29E0	2,05E1	1,57E−1	MND	MND	4,51E-2	7,13E−2	7,45E-1	7,41E-3	-3,32E-1
Non-renew. PER used as materials	MJ	0E0	0E0	0E0	0E0	0E0	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of non-renewable PER	MJ	1,24E1	4,8E0	3,29E0	2,05E1	1,57E−1	MND	MND	4,51E−2	7,13E−2	7,45E−1	7,41E−3	-3,32E−1
Use of secondary materials	kg	1,32E0	1,64E−3	6,04E−4	1,32E0	5,37E−5	MND	MND	2,23E−5	2,44E−5	3,68E−4	2E−6	1,78E−2
Use of renewable secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of non-renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m3	3,49E−3	9,91E−4	7,8E−4	5,26E−3	3,24E−5	MND	MND	4,01E−6	1,47E−5	6,62E−5	8,05E−6	−1,92E−4

PER abbreviation stands for primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	Kg	1,83E−1	4,63E−3	6,87E−3	1,94E−1	1,51E−4	MND	MND	4,88E−5	6,87E−5	8,07E−4	6,89E−6	−3,47E−3
Non-hazardous waste	Kg	1,84E0	5,12E−1	1,9E−1	2,55E0	1,67E−2	MND	MND	5,22E−4	7,6E−3	8,62E−3	5,02E−2	−3,91E−2
Radioactive waste	Kg	5,08E−5	3,28E−5	2,91E−5	1,13E−4	1,07E−6	MND	MND	3,18E−7	4,88E−7	5,26E−6	4,88E−8	1,56E−7

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	Kg	0E0	0E0	0E0	0E0	0E0	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	Kg	0E0	0E0	2,47E−1	2,47E-1	0E0	MND	MND	0E0	0E0	9,5E−1	0E0	0E0
Materials for energy recovery	Kg	0E0	0E0	0E0	0E0	0E0	MND	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	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-B7	C1	C2	C3	C4	D
Climate change – total	kg CO2e	6,2E−1	2,93E−1	1,21E−1	1,03E0	9,59E−3	MND	MND	3,3E−3	4,36E−3	5,45E−2	2,64E−4	−2,87E−2
Abiotic depletion, minerals & metals	kg Sbe	8,82E−6	5,22E−6	3,19E−7	1,44E−5	1,71E−7	MND	MND	5,03E−9	7,75E−8	8,32E−8	2,41E−9	−2,87E−8
Abiotic depletion of fossil resources	MJ	9,89E0	4,71E0	1,57E0	1,62E1	1,54E−1	MND	MND	4,48E−2	6,99E−2	7,4E−1	7,33E−3	−3,57E−1
Water use	m3e depr.	3,49E−3	9,91E−4	7,8E−4	5,26E−3	3,24E−5	MND	MND	4,01E−6	1,47E−5	6,62E−5	8,05E−6	−1,92E−4
Use of secondary materials	kg	1,32E0	1,64E−3	6,04E−4	1,32E0	5,37E−5	MND	MND	2,23E−5	2,44E−5	3,68E−4	2E−6	1,78E−2
Biogenic carbon content in product	kg C	N/A	N/A	0E0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic carbon content in packaging*	kg C	N/A	N/A	0E0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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 CO2e / kWh	0,24 kg CO_2e / kWh
District heating data source and quality	Heat and power co-generation, natural gas, conventional power plant, 100mw electrical (Reference product: heat, district or industrial, natural gas), Finland, Ecoinvent 3.6, year: 2019
District heating CO2e / kWh	0,11 kg CO_2e / kWh

Transport scenario documentation

Scenario parameter	Value
A4 specific transport CO2e emissions, kg CO2e / tkm	0,0886
A4 average transport distance, km	110
Transport capacity utilization, %	100
Bulk density of transported products, kg/m3	7850
Volume capacity utilization factor for nested packaged products	1

End of life scenario documentation

Scenario parameter	Value
Collection process – kg collected separately	1,00
Collection process – kg collected with mixed waste	-
Recovery process – kg for re-use	-
Recovery process – kg for recycling	0,95
Recovery process – kg for energy recovery	-
Disposal (total) – kg for final deposition	0,05
Scenario assumptions for transportation	End-of-life product is transported 50 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 and One Click LCA database.

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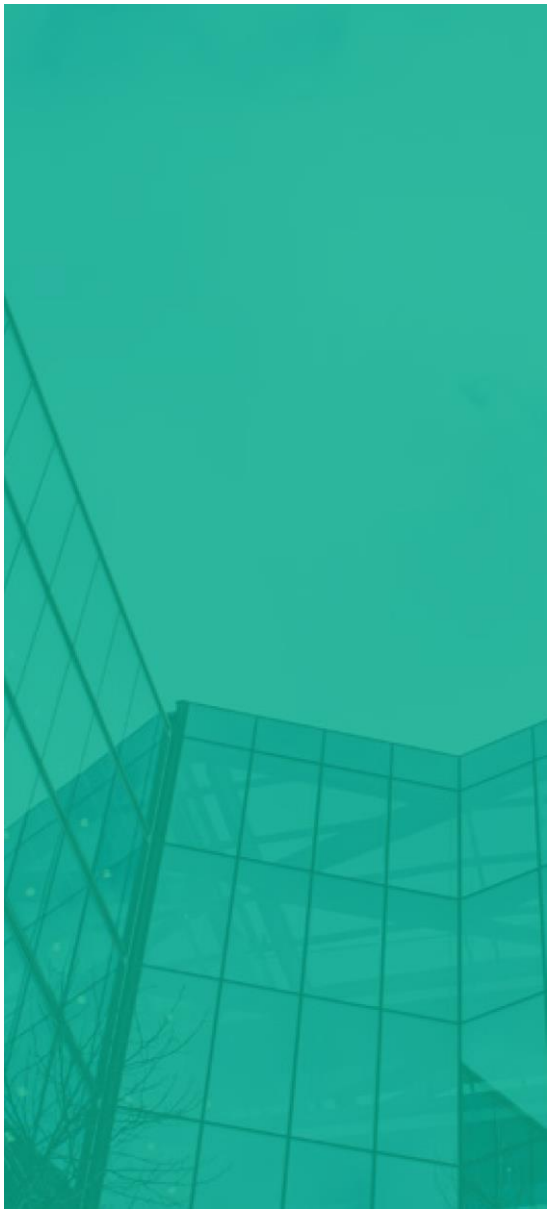

ABOUT THE MANUFACTURER

Precasters, builders, constructors, developers, flooring specialists, machine manufacturers, power plant designers, architects, and structural designers – can all enjoy and take advantage of Peikko's solutions.

Peikko is a family-owned company founded in 1965. It is headquartered in Lahti, Finland.

Peikko supplies a large selection of concrete connections and composite beams for both precast and cast-in-situ solutions in a wide variety of applications. Peikko's innovative solutions make your construction process faster, safer, and more effective.

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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 Primary Steel and Aluminium and all Metal-Based Products

ANNEX

ENVIRONMENTAL IMPACTS - EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Global warming potential	kg CO2e	6,06E−1	2,9E−1	1,18E−1	1,01E0	9,5E−3	MND	MND	3,27E−3	4,32E−3	5,41E−2	2,58E−4	−2,75E−2
Depletion of stratospheric ozone	kg CFC11e	5,9E−8	5,72E−8	1,99E−8	1,36E−7	1,87E−9	MND	MND	5,63E−10	8,5E−10	9,31E−9	8,59E−11	−6,8E−10
Acidification	kg SO2e	2,48E−3	6,23E−4	3,33E−4	3,44E−3	2,04E−5	MND	MND	4,87E−6	9,25E−6	8,04E−5	1,04E−6	−8,75E−5
Eutrophication	kg PO4 3e	1,55E−3	1,26E−4	1,52E−4	1,83E−3	4,11E−6	MND	MND	8,57E−7	1,87E−6	1,42E−5	2,02E−7	−4,84E−5
Photochemical ozone formation	kg C2H4e	2,59E−4	3,58E−5	1,56E−5	3,11E−4	1,17E−6	MND	MND	5,01E−7	5,32E−7	8,28E−6	7,64E−8	−2,26E−5
Abiotic depletion of non-fossil res.	kg Sbe	8,82E−6	5,22E−6	3,19E−7	1,44E−5	1,71E−7	MND	MND	5,03E−9	7,75E−8	8,32E−8	2,41E−9	−2,87E−8
Abiotic depletion of fossil resources	MJ	9,89E0	4,71E0	1,57E0	1,62E1	1,54E−1	MND	MND	4,48E−2	6,99E−2	7,4E−1	7,33E−3	−3,57E−1

MDN abbreviation stands for Module Not Declared

ENVIRONMENTAL IMPACTS - TRACI 2.1. / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Global warming potential	kg CO2e	5,99E−1	2,9E−1	1,18E−1	1,01E0	9,49E−3	MND	MND	3,26E−3	4,31E−3	5,38E−2	2,57E−4	−2,66E−2
Ozone depletion	kg CFC11e	7,74E−8	7,62E−8	2,48E−8	1,78E−7	2,49E−9	MND	MND	7,51E−10	1,13E−9	1,24E−8	1,15E−10	−9,86E−10
Acidification	kg SO2e	2,39E−3	5,88E−4	3,23E−4	3,3E−3	1,92E−5	MND	MND	4,58E−6	8,73E−6	7,57E−5	1,04E−6	−8,69E−5
Eutrophication	kg Ne	3,4E−3	2,76E−4	3,1E−4	3,98E−3	9,03E−6	MND	MND	1,99E−6	4,1E−6	3,3E−5	3,84E−7	−1,04E−4
Photochemical Smog Formation	kg O3e	2,91E−2	6,18E−3	3,98E−3	3,93E−2	2,02E−4	MND	MND	4,62E−5	9,18E−5	7,63E−4	1,51E−5	−1,15E−3