ENVIRONMENTAL PRODUCT DECLARATION

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

Connecting Parts
Peikko Group Corporation

EPD HUB, HUB-0004
Publishing date 15 Mar. 2022, last updated date 15 Mar. 2022, valid until 15 Mar. 2027

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Peikko Group Corporation
Address	R. Kalantos str. 49, Kaunas, 52303 Lithuania
Contact details	jaakko.yrjola@peikko.com
Website	www.peikko.com

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.0, 01 Feb 2022
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4 and D
EPD author	Patience Wanjala, Peikko Group Oy
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	Elma Avdyli, EPD Hub

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.

PRODUCT

Product name	Connecting Parts
Place of production	Lithuania
Period for data	2020
Averaging in EPD	Multiple Products

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg of Connecting parts
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	1,92
GWP-total, A1-A3 (kgCO2e)	1,93
Secondary material, inputs (%)	38,1
Secondary material, outputs (%)	95,0
Total energy use, A1-A3 (kWh)	6,62
Total water use, A1-A3 (m3e)	0,0155

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Information about the manufacturer can be found at: www.peikko.com

PRODUCT DESCRIPTION

This EPD represents connecting parts produced at Peikko facility in Kaunas, Lithuania. Connecting parts are precast and cast-in-situ concrete connections, which include a wide range of components such as balcony connections, welded connections, fastening plates, column and wall shoes and anchor bolts Further information can be found at www.peikko.com

PRODUCT RAW MATERIAL MAIN COMPOSITION

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

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate.

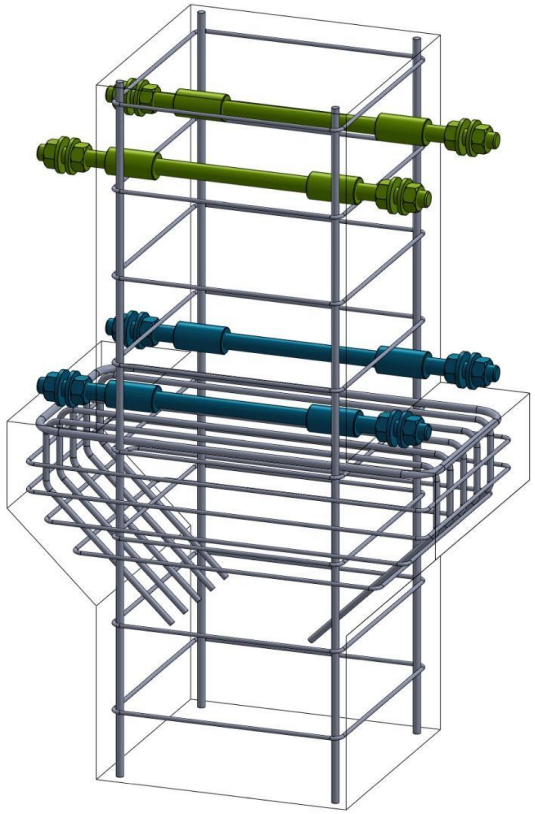
Biogenic carbon content in product, kg C	0.0
Biogenic carbon content in packaging, kg C	0.001023

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg of Connecting parts
Mass per declared unit	1 kg

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	x	MND	MND	MND	MND	MND	MND	MND	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.

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.

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

A2: The considered transportation impacts (A2) include exhaust emissions resulting from the transport of all raw materials from suppliers to Peikko Lithuania production plant as well as the environmental impacts of production of the used fuel. 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 Lithuania.

A3: The environmental impacts considered for the production stage (A3) cover the manufacturing of the production materials (welding gases, lubricating oils and blasting steel shots) and fuels used by machines. Also handling of waste formed in the production processes at the production plant is covered. The environmental impacts of this stage have been calculated using the most recent data in regard to what applied in the factory. The data is from the year 2020. 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 direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

A4: 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. The transportation distance is defined according to EPD Hub PCR. Connecting parts transportation is taking place mainly from Kaunas to Vilnius which is 104 km away. However, some products are transported further out of the capital region, hence an average distance of 400 km is assumed. It was considered that the transportation company will acquire other shipments to other directions in order to maximise their efficiency. The transportation method is assumed to be lorry, which is the most common mode of transport in the region and the fill rate was assumed to be 100%. Transportation does not cause losses as product are packaged properly.

A5: Generation of waste at the construction site occurred from the packaging wood pallets and carton boxes. A5 cover the treatment of the packaging wood pallets which is assumed are incinerated and the generated energy can replace the need for heat energy in district heating, and waste paperboards from carton boxes which is assumed is recycled. The transportation distance to the nearest incineration plant is assumed as 50km and the transportation method assumed to be lorry. This is an average distance which considers the fact that according to the scenario A4 products are situated in capital regions of Lithuania and distance to recycling and landfill facilities is not very long in the capital regions.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase. Air, soil, and water impacts 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).

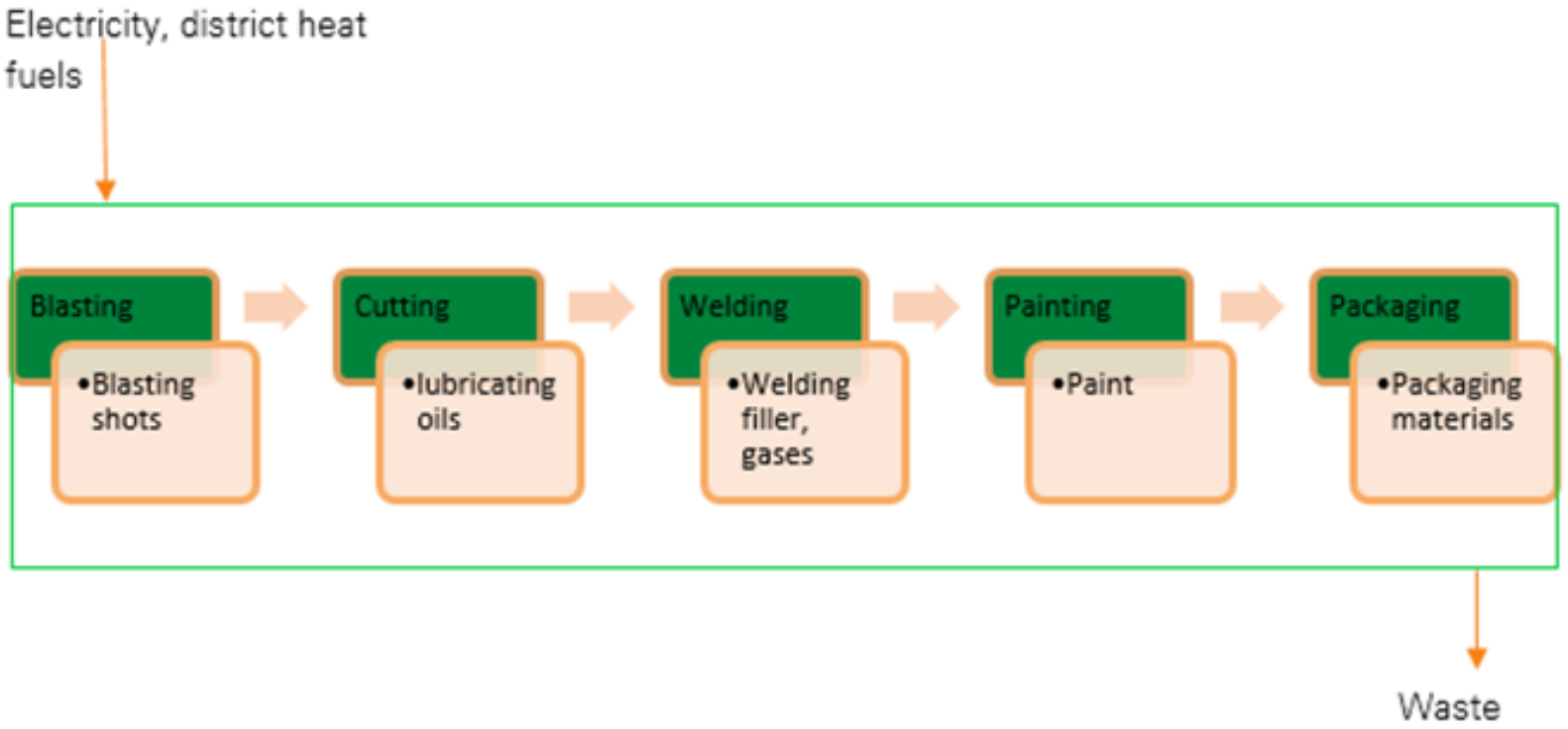
C1: Demolition is assumed to take 0.01 kWh/kg of element. It is assumed that 100% of waste is collected. Energy consumption of demolition process is on the average 10 kWh/m2 (Bozdag, Ö. & Secer, M. 2007). Based on Level(s) project, an average mass of concrete building is about 1000 kg/m2. Thus, energy consumption of demolition is 10 kWh / 1000 kg = 0.01 kWh/kg.

C2: 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 within the capital areas and distance to recycling and landfill facilities is not very long.
C3: 95% of steel is assumed to be recycled based on World Steel Association, 2020.

C4: It is assumed that 5% of steel is taken to landfill for final disposal.

D: Due to the recycling process the end-of-life product is converted into a recycled steel (D).

MANUFACTURING PROCESS



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.

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. The study does not exclude any modules or processes which are stated mandatory in the EN 15804+A2:2019 and EPD Hub PCR. The study does not exclude any hazardous materials or substances. Modules B1 – B7 have not been calculated nor included in the LCA calculations.

The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes for which data is available are included in the calculation. There is no neglected unit process more than 1% of total mass and energy flows. The total excluded input and output flows do 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. Excluded chemicals, such as paints and thinners, do not contain any hazardous substances and can be thus left out from LCA analysis.

Processes excluded from the assessment and the related cut-off criteria are provided below:

Weight loss (waste streams) of ancillary materials (oils, cut liquids etc.), Mass, < 0.1 % .
Mixed waste, Mass, < 0.5 %.
Other waste streams (paper waste, energy waste etc.),
Mass, < 0.7 %

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 also excluded.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation.

In this study, as per the reference standard, allocation is conducted in the following order;

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g., mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

Since the plant produces only connecting parts, allocation was not necessary. The values for 1 kg of the product, which is used within the study, is calculated by considering the total production output (kg) for the product per annual production output (kg) of the plant. The annual production output of the declared product, the annual total energy consumption, packaging materials and the generated waste data is given from the production plant. Subsequently, the product output fixed to 1 kg and the corresponding amounts of consumption, packaging, and generated waste of 1 kg equivalent of the product is used in calculations.

Allocation used in environmental data sources is aligned with the above.

AVERAGES AND VARIABILITY

Product Group Average

Connecting parts are a range of standard and custom-made products. Their orders contain different steel grades and in different quantities, i.e., some products may contain more steel plates and less rebar or vice versa. Therefore, typical order cannot be defined and for this reason this assessment studies the average material composition for this product group. The effect of different material variances on the results of the connecting parts were studied. Impacts which do not vary more than ±10% of the calculated A1-A3 values have been considered to be of reasonable accuracy. The variances were tested incrementally to see which compositions fall inside the provided range. The materials with the largest impacts have been taken into consideration as the remaining materials have only a negligible effect on the impact categories. However, to incorporate the variance of these minor materials a conservative approach has been taken and the variance has been kept smaller than the 10 % as has been presented below.

The main materials in the average composition are steel plate 60%, rebar, 26% and steel profiles, 12% which contribute a total of 98% of the final product. The production of these materials contributes approximately 90% of the GWP impacts of the connecting parts. Due to impacts of the rebar being higher than of steel plate, the impacts of the product increases as the share of the rebar in the product increases. The steel plate can vary between 55 – 65 w%, rebar 21 - 31 w% and steel profile 7 – 17 w% so that the total w% of these three materials is 98 %. The remaining share consists of welding fillers and paint for which the w% can vary inside the remaining 2 w%. The results are only valid for this average composition

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent and One Click LCA databases were used as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total	kg CO_2e	1,84E0	1,46E-2	7,4E-2	1,93E0	3,48E-2	4,65E-3	MND	MND	MND	MND	MND	MND	MND	3,3E-3	4,36E-3	5,45E-2	2,64E-4	-7,57E-1
GWP – fossil	kg CO_2e	1,83E0	1,46E-2	7,04E-2	1,92E0	3,51E-2	1,49E-4	MND	MND	MND	MND	MND	MND	MND	3,3E-3	4,35E-3	5,45E-2	2,63E-4	-7,63E-1
GWP – biogenic	kg CO_2e	-9,59E-3	1,1E-5	1,94E-3	-7,63E-3	2,66E-5	4,5E-3	MND	MND	MND	MND	MND	MND	MND	9,17E-7	3,3E-6	1,51E-5	5,22E-7	5,64E-3
GWP – LULUC	kg CO_2e	1,33E-2	4,57E-6	1,6E-3	1,49E-2	1,1E-5	6,29E-8	MND	MND	MND	MND	MND	MND	MND	2,79E-7	1,37E-6	4,6E-6	7,82E-8	1,93E-5
Ozone depletion pot.	kg $CFC_{-11}e$	1,08E-7	3,58E-9	9,75E-9	1,21E-7	8,63E-9	2,76E-11	MND	MND	MND	MND	MND	MND	MND	7,12E-10	1,07E-9	1,18E-8	1,08E-10	-2,03E-8
Acidification potential	mol H^+e	8,41E-3	4,68E-5	3,33E-4	8,79E-3	1,13E-4	9,46E-7	MND	MND	MND	MND	MND	MND	MND	3,45E-5	1,4E-5	5,7E-4	2,5E-6	-2,95E-3
EP-freshwater[3)]	kg Pe	9,05E-5	1,24E-7	3,95E-6	9,46E-5	2,98E-7	1,78E-9	MND	MND	MND	MND	MND	MND	MND	1,33E-8	3,7E-8	2,2E-7	3,18E-9	-3,07E-5
EP-marine	kg Ne	1,64E-3	1,03E-5	6,43E-5	1,71E-3	2,48E-5	1,21E-6	MND	MND	MND	MND	MND	MND	MND	1,52E-5	3,08E-6	2,52E-4	8,61E-7	-5,82E-4
EP-terrestrial	mol Ne	1,76E-2	1,15E-4	7,73E-4	1,85E-2	2,76E-4	3,3E-6	MND	MND	MND	MND	MND	MND	MND	1,67E-4	3,43E-5	2,76E-3	9,48E-6	-6,16E-3
POCP (“smog”)	kg NMVOCe	8,9E-3	4,5E-5	2,01E-4	9,15E-3	1,08E-4	1,42E-6	MND	MND	MND	MND	MND	MND	MND	4,59E-5	1,34E-5	7,59E-4	2,75E-6	-4,01E-3
ADP-minerals & metals	kg Sbe	1,17E-5	2,59E-7	3,02E-7	1,22E-5	6,26E-7	3,75E-9	MND	MND	MND	MND	MND	MND	MND	5,03E-9	7,75E-8	8,32E-8	2,41E-9	-7,59E-7
ADP-fossil resources	MJ	2,02E1	2,37E-1	1,33E0	2,18E1	5,71E-1	1,98E-3	MND	MND	MND	MND	MND	MND	MND	4,54E-2	7,07E-2	7,49E-1	7,36E-3	-5,63E0
Water use[2)]	m^3e depr.	7,35E-1	8,79E-4	4,42E-2	7,8E-1	2,12E-3	3,7E-5	MND	MND	MND	MND	MND	MND	MND	8,46E-5	2,63E-4	1,4E-3	3,4E-4	-1,08E-1

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) 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 experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

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	1,54E-7	1,28E-9	3,12E-9	1,59E-7	3,08E-9	2,89E-11	MND	MND	MND	MND	MND	MND	MND	9,14E-10	3,82E-10	1,51E-8	4,86E-11	-5,43E-8
Ionizing radiation[5)]	kBq U235e	4,71E-2	1,03E-3	8,68E-3	5,68E-2	2,49E-3	7,88E-6	MND	MND	MND	MND	MND	MND	MND	1,94E-4	3,09E-4	3,21E-3	3,02E-5	8,61E-3
Ecotoxicity (freshwater)	CTUe	5,27E1	1,81E-1	1,09E0	5,4E1	4,36E-1	5,79E-3	MND	MND	MND	MND	MND	MND	MND	2,66E-2	5,4E-2	4,4E-1	4,65E-3	-2,5E1
Human toxicity, cancer	CTUh	1,07E-8	4,55E-12	2,9E-11	1,08E-8	1,1E-11	5,56E-13	MND	MND	MND	MND	MND	MND	MND	9,53E-13	1,36E-12	1,58E-11	1,1E-13	-1,67E-10
Human tox. non-cancer	CTUh	1,26E-7	2,06E-10	7,28E-10	1,26E-7	4,98E-10	1,14E-11	MND	MND	MND	MND	MND	MND	MND	2,35E-11	6,17E-11	3,88E-10	3,39E-12	1,29E-7
SQP	-	4,08E0	3,57E-1	6,1E-2	4,5E0	8,61E-1	2,15E-3	MND	MND	MND	MND	MND	MND	MND	1,16E-3	1,07E-1	1,92E-2	1,25E-2	-1,36E0

4) SQP = Land use related impacts/soil quality.5) 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	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy	MJ	1,24E0	2,98E-3	8,54E-1	2,1E0	7,18E-3	4,36E-5	MND	MND	MND	MND	MND	MND	MND	2,45E-4	8,9E-4	4,05E-3	5,95E-5	3,38E-2
Renew. PER as material	MJ	0E0	0E0	1,32E-2	1,32E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	1,24E0	2,98E-3	8,67E-1	2,11E0	7,18E-3	4,36E-5	MND	MND	MND	MND	MND	MND	MND	2,45E-4	8,9E-4	4,05E-3	5,95E-5	3,38E-2
Non-re. PER as energy	MJ	2,02E1	2,37E-1	1,32E0	2,17E1	5,71E-1	1,98E-3	MND	MND	MND	MND	MND	MND	MND	4,54E-2	7,07E-2	7,49E-1	7,36E-3	-5,63E0
Non-re. PER as material	MJ	0E0	0E0	4,33E-3	4,33E-3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	2,02E1	2,37E-1	1,33E0	2,18E1	5,71E-1	1,98E-3	MND	MND	MND	MND	MND	MND	MND	4,54E-2	7,07E-2	7,49E-1	7,36E-3	-5,63E0
Secondary materials	kg	3,8E-1	0E0	1,8E-4	3,81E-1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	3,57E-1
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m^3	1,51E-2	4,92E-5	3,76E-4	1,55E-2	1,19E-4	2,17E-6	MND	MND	MND	MND	MND	MND	MND	4,01E-6	1,47E-5	6,62E-5	8,05E-6	-5,06E-3

6) 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	3,54E-1	2,3E-4	2,69E-3	3,57E-1	5,54E-4	2,1E-5	MND	MND	MND	MND	MND	MND	MND	4,88E-5	6,87E-5	0E0	6,87E-6	-9,16E-2
Non-hazardous waste	kg	3,58E0	2,54E-2	1,49E-1	3,75E0	6,13E-2	2,49E-3	MND	MND	MND	MND	MND	MND	MND	5,22E-4	7,6E-3	0E0	5E-2	-1,03E0
Radioactive waste	kg	4,54E-5	1,62E-6	6,14E-6	5,31E-5	3,92E-6	1,18E-8	MND	MND	MND	MND	MND	MND	MND	3,18E-7	4,86E-7	0E0	4,87E-8	4,11E-6

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	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	0E0	0E0	0E0	3,2E-3	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	9,5E-1	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	1,6E-3	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	2,97E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0

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

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	1,77E0	1,44E-2	7,08E-2	1,86E0	3,48E-2	1,06E-3	MND	MND	MND	MND	MND	MND	MND	3,27E-3	4,32E-3	5,41E-2	2,58E-4	-7,26E-1
Ozone depletion Pot.	kg $CFC_{-11}e$	9,73E-8	2,84E-9	8,75E-9	1,09E-7	6,86E-9	2,29E-11	MND	MND	MND	MND	MND	MND	MND	5,63E-10	8,5E-10	9,31E-9	8,59E-11	-1,8E-8
Acidification	kg SO_2e	6,56E-3	3,09E-5	2,7E-4	6,86E-3	7,46E-5	9,3E-7	MND	MND	MND	MND	MND	MND	MND	4,87E-6	9,25E-6	8,04E-5	1,04E-6	-2,31E-3
Eutrophication	kg PO_4^3e	3,6E-3	6,25E-6	1,22E-4	3,73E-3	1,51E-5	3,19E-6	MND	MND	MND	MND	MND	MND	MND	8,57E-7	1,87E-6	1,42E-5	2,02E-7	-1,28E-3
POCP (“smog”)	kg C_2H_4e	1,13E-3	1,78E-6	1,22E-5	1,15E-3	4,3E-6	3,22E-7	MND	MND	MND	MND	MND	MND	MND	5,01E-7	5,32E-7	8,28E-6	7,64E-8	-5,97E-4
ADP-elements	kg Sbe	1,17E-5	2,59E-7	3,02E-7	1,22E-5	6,26E-7	3,75E-9	MND	MND	MND	MND	MND	MND	MND	5,03E-9	7,75E-8	8,32E-8	2,41E-9	-7,59E-7
ADP-fossil	MJ	2,02E1	2,37E-1	1,33E0	2,18E1	5,71E-1	1,98E-3	MND	MND	MND	MND	MND	MND	MND	4,54E-2	7,07E-2	7,49E-1	7,36E-3	-5,63E0

ENVIRONMENTAL IMPACTS – TRACI 2.1. / ISO 21930

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	1,74E0	1,44E-2	7,1E-2	1,82E0	3,48E-2	1,16E-3	MND	MND	MND	MND	MND	MND	MND	3,26E-3	4,31E-3	5,38E-2	2,57E-4	-7,03E-1
Ozone Depletion	kg $CFC_{-11}e$	1,31E-7	3,79E-9	1,15E-8	1,46E-7	9,14E-9	2,94E-11	MND	MND	MND	MND	MND	MND	MND	7,51E-10	1,13E-9	1,24E-8	1,15E-10	-2,61E-8
Acidification	kg SO_2e	7,03E-3	3,96E-5	2,76E-4	7,34E-3	9,54E-5	9,68E-7	MND	MND	MND	MND	MND	MND	MND	3,16E-5	1,18E-5	5,22E-4	2,22E-6	-2,46E-3
Eutrophication	kg Ne	1,08E-3	6,81E-6	3,96E-5	1,12E-3	1,64E-5	1,23E-6	MND	MND	MND	MND	MND	MND	MND	2,79E-6	2,03E-6	4,6E-5	2,65E-7	-3,68E-4
POCP (“smog”)	kg O_3e	9,48E-2	6,5E-4	4E-3	9,95E-2	1,57E-3	1,91E-5	MND	MND	MND	MND	MND	MND	MND	9,69E-4	1,94E-4	1,6E-2	5,47E-5	-3,33E-2
ADP-fossil	MJ	1,11E0	3,39E-2	1,3E-1	1,27E0	8,17E-2	2,71E-4	MND	MND	MND	MND	MND	MND	MND	6,71E-3	1,01E-2	1,11E-1	1,07E-3	-8,93E-2

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Elma Avdyli, approved verifier by EPD Hub, 15.03.2022

VERIFIED ISO 14025