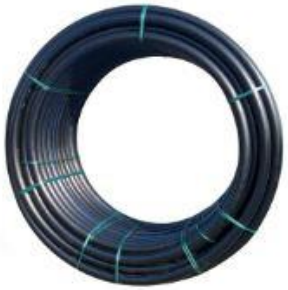
ENVIRONMENTAL PRODUCT DECLARATION

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

Plastic piping systems for water supply, and for drainage and sewerage under pressure

Pipelife Finland Oy



EPD HUB, HUB-0517

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Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Pipelife Finland Oy
Address	Kiviharjunlenkki 1 E, 90220 Oulu
Contact details	asiakaspalvelu@pipelife.fi
Website	https://www.pipelife.fi/

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, 1 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, D
EPD author	Riikka Vaara, Pipelife Finland Oy
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited

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	Plastic piping systems for water supply, and for drainage and sewerage under pressure
Additional labels	Blue, brown, or non-stripes in pipes
Product reference	All pressure pipes from standards EN12201 (PE80/PE100: SDR11, SDR13,6, SDR17, SDR21, SDR26)
Place of production	Pipelife Hafab AB (Haaparanta)
Period for data	1.1.2021-31.12.2022
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	<10 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg of pipe
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	2,04E0
GWP-total, A1-A3 (kgCO2e)	1,99 E0
Secondary material, inputs (%)	0.438
Secondary material, outputs (%)	5.0
Total energy use, A1-A3 (kWh)	7.69
Total water use, A1-A3 (m3e)	5,2E-3

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Pipelife Finland Oy is one of the leading providers of Plastic construction solutions in Finland. The product range consists of plastic pipe, tank and chamber solutions, rainwater management, oil and sand separation solutions, wastewater treatment solutions, and solutions for energy and data network construction, as well as electric installations. Pipelife Finland solutions are used in construction in infrastructure, housing and industrial applications.

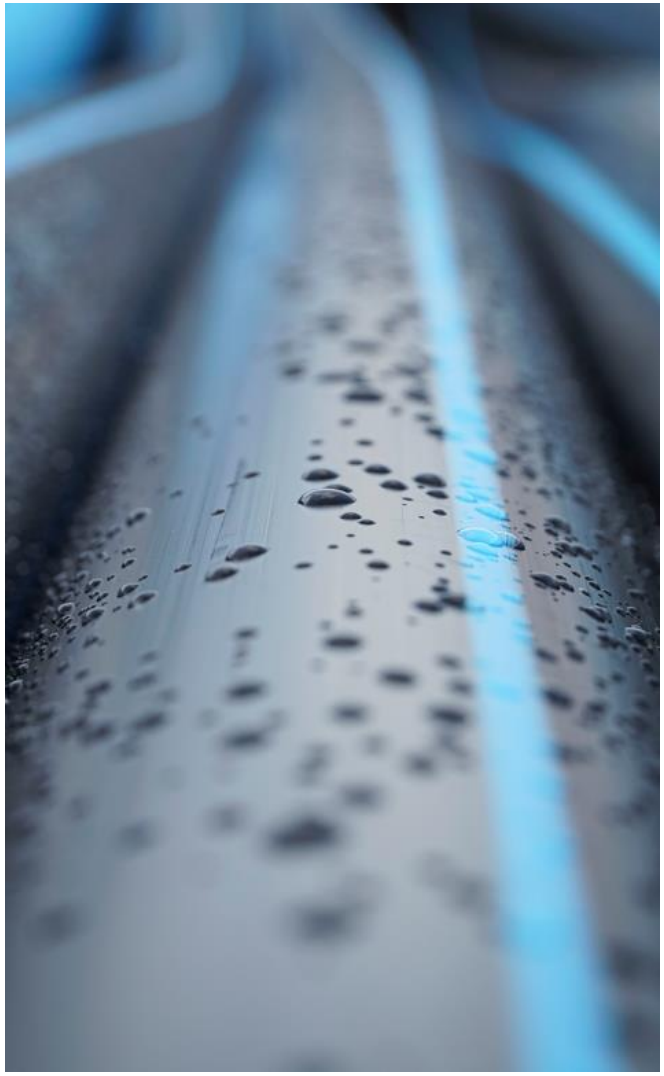
Pipelife Finland Oy employs about 250 employees in Finland. The company is part of leading global construction solution provider Wienerberger AG and its piping solution division WPS. It operates globally in 25 countries and provides piping solutions based on plastic and ceramic materials.
We are certified according to EN ISO 9001 Quality Management system and EN ISO 14001 Environmental Management system.

PRODUCT DESCRIPTION

Pipelife PE pressure pipes are used as water pipes, sewers and industrial process pipes.

Pipelife manufactures PE pressure pipes according to SFS-EN 12201-2 (pressure water pipe). We manufacture pressure pipes from PE80, PE100 and PE100RC raw material. Depending on the dimensions, PE pressure pipes are supplied either in the desired length, in rolls or in coils.

Further information can be found at https://www.pipelife.fi/.



Plastic piping systems for water supply, and for drainage and sewerage under pressure

PRODUCT RAW MATERIAL MAIN COMPOSITION

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

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0.0185

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg of pipe
Mass per declared unit	1 kg
Functional unit VP	-
Reference service life VP	-

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.

Manufacturing materials (A1)

The first module includes extraction and production of raw materials used in manufacturing process, mainly polyethylene granulates, as well as additives used in small amounts. Environmental impact for production of packaging materials and auxiliary materials are also included in this module.

Transport for manufacturing materials (A2)

Transport distances of materials to manufacturing site was modelled taking account location of suppliers and transportation routes. Raw materials are transported by lorry and by boat. Packaging materials and auxiliary tools are transported by lorry on the road.

Manufacturing process (A3)

The production method is a pipe extrusion. The different stages are:

Material conveying

The raw material is delivered by container and unloaded into silos at the product manufacturing site.

Extrusion (melting and processing of material)

The extruder converts plastic raw material into a continuous tubular form by squeezing it through an annular nozzle.

Cooling

The melted pipe passes through sizing or calibration benches (which adjust the dimensions of the pipe) into a vacuum cooling tank, which cools the pipe to its shape. There are usually two other cooling tanks to cool the pipe.

Printing

The laser stamping machine marks pipes according to the used material, pipe size, diameter, length and produced batch number.

Cutting/ coiling/ cutting

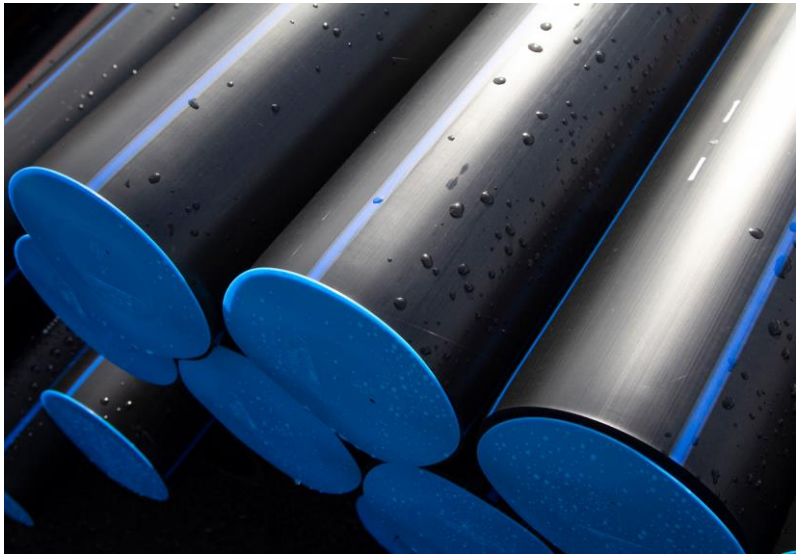
The pipes are cut to the required length or coiled. The length of the pipes is usually 6, 12, 18 or 30 metres and the length of the coils starts from 50 metres.

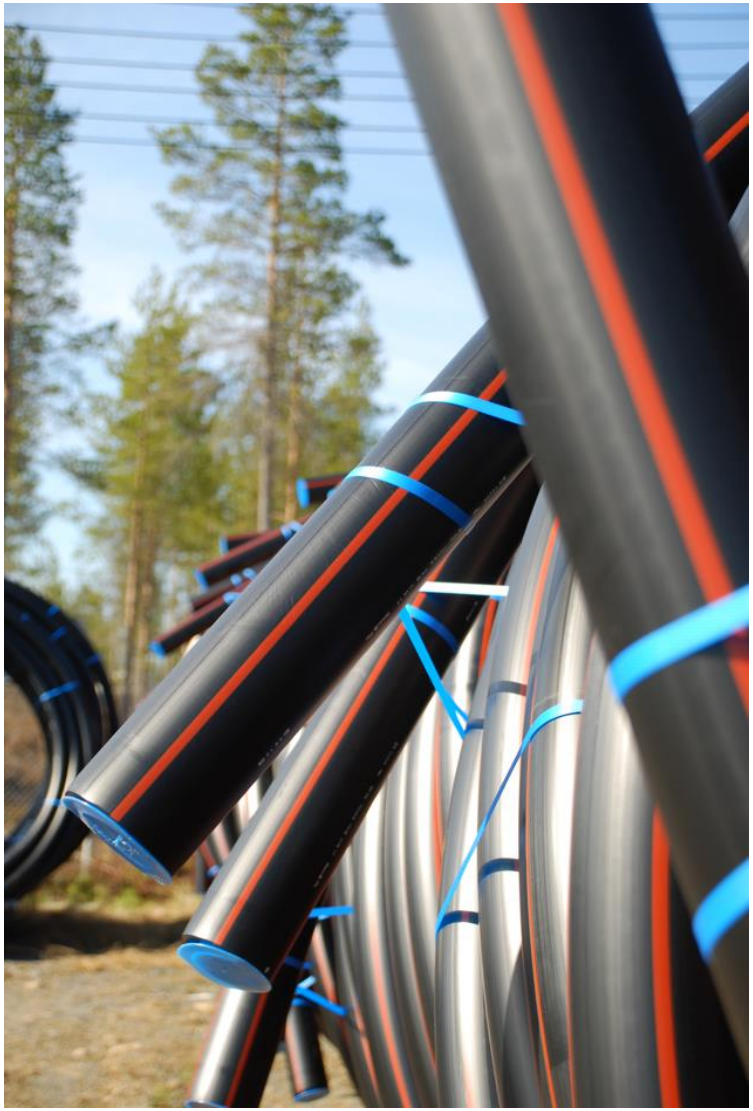
Packaging

The pipes are packed in a wooden frame, which is tied down with plastic straps. The coils are tied with plastic straps. (PET).

Dispatch

After the final quality check, the products are sent to the ordered destination.





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.

The average transport distance from the production plant to the building site is assumed to be 470 km, and the transport method is assumed to be a lorry. Transport does not cause losses, because products are packaged properly. During transportation there is not product or packaging loss. The installation accounts for the treatment of packaging waste.

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.

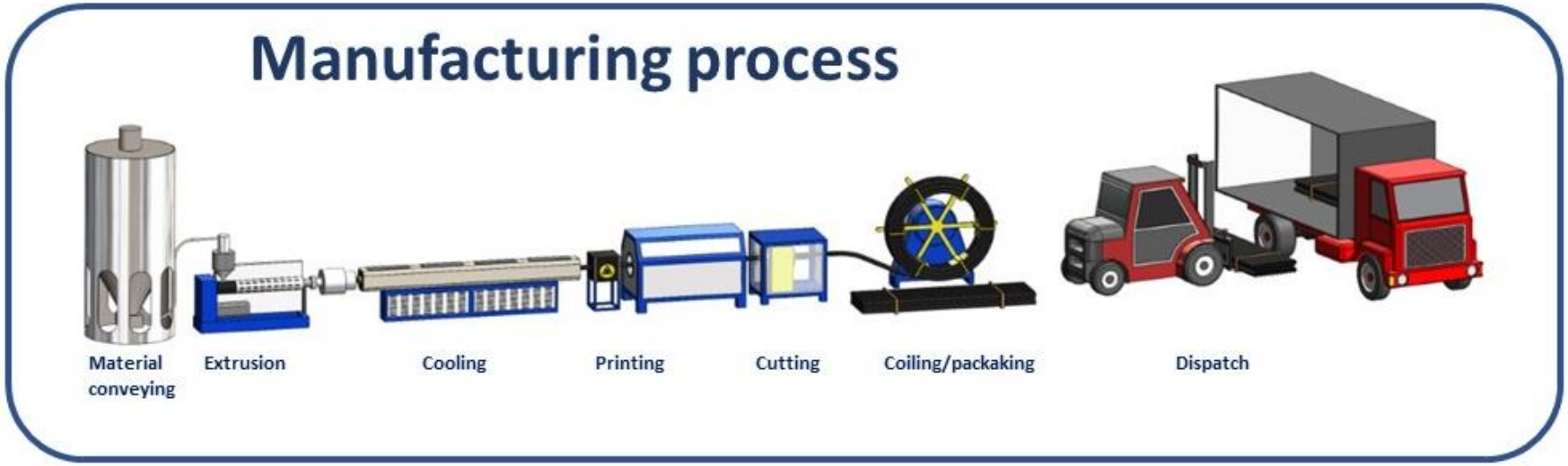
PRODUCT END OF LIFE (C1-C4, D)

Since the consumption of energy and natural resources is negligible for disassembling the end-of-life product, the impacts of demolition are assumed to be zero (C1). The end-of-life product is assumed to be sent to the closest facilities by lorry, and the journey is assumed to be 50 km (C2).

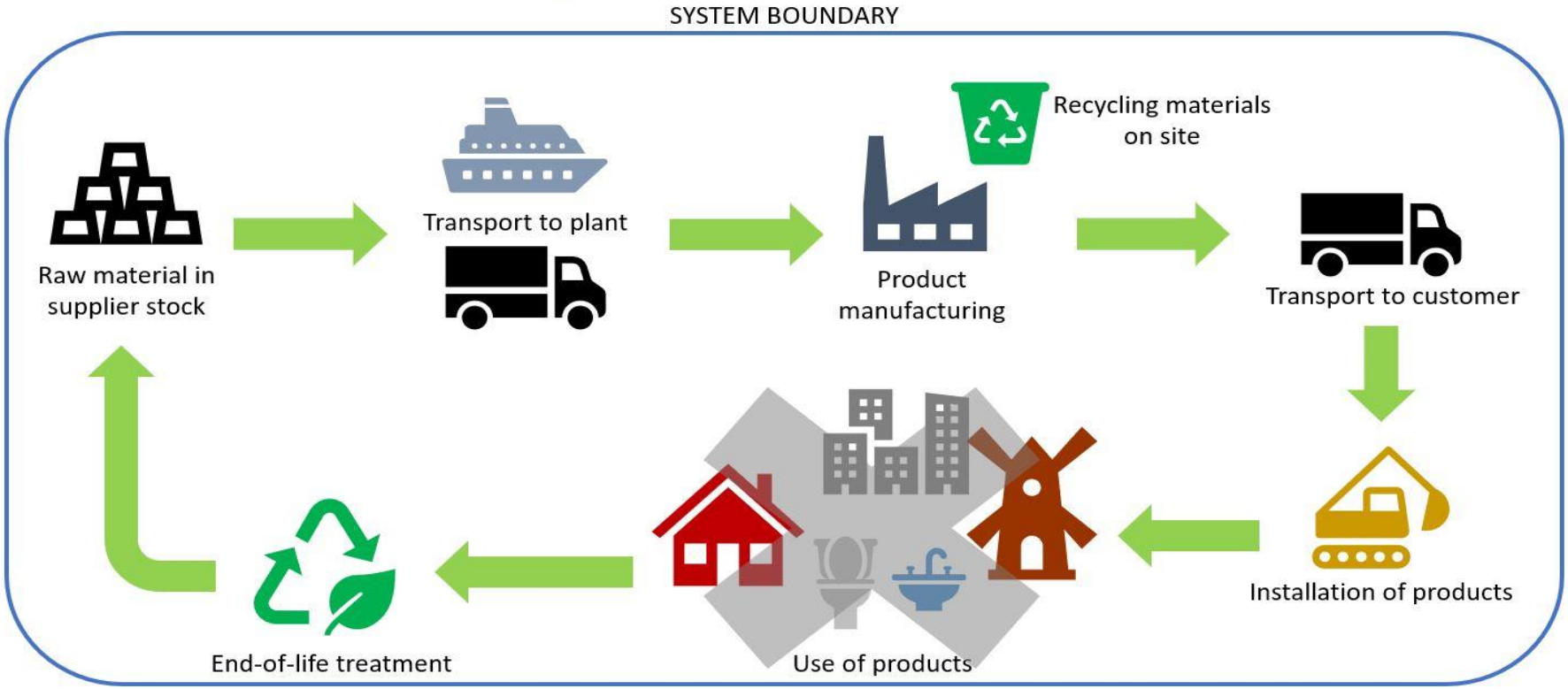
Old pipes can be recycled, and the material reused after recycling. Five per cent, collected from the unloading site, is sent for recycling (C3), while the remaining 95% is left inert underground (C4).

Due to the recycling and incineration potential of Polyethylene/Polypropylene, the end-of-life product is converted into recycled PE/PP, while energy and heat are produced from its incineration (D). The benefits and loads of waste packaging materials in A5 are also considered in module D.

MANUFACTURING PROCESS



Product Life Cycle



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. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging materials	No allocation
Ancillary materials	No allocation
Manufacturing energy and waste	No allocation

AVERAGES AND VARIABILITY

Type of average	Multiple products
Averaging method	Averaged by shares of total mass
Variation in GWP-fossil for A1-A3	<10 %

EPD calculation is based on average. Calculation is per kg of pipe including in-house recycling. Packaging materials, consumed electricity, waste materials, water and transportation are calculated based on average value.

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[1)]	kg CO_2e	2,01E0	2,63E-2	-5,13E-2	1,99E0	6,37E-2	1,93E-1	MND	MND	MND	MND	MND	MND	MND	0E0	2,58E-4	1,84E-2	1,41E-1	-1,53E-1
GWP – fossil	kg CO_2e	2E0	2,63E-2	9,44E-3	2,04E0	6,43E-2	7,93E-4	MND	MND	MND	MND	MND	MND	MND	0E0	2,58E-4	1,85E-2	1,41E-1	-1,56E-1
GWP – biogenic	kg CO_2e	1,04E-2	-5,14E-6	-6,08E-2	-5,03E-2	3,94E-5	1,92E-1	MND	MND	MND	MND	MND	MND	MND	0E0	1,18E-7	-7,71E-5	1,09E-4	3,12E-3
GWP – LULUC	kg CO_2e	6,18E-4	1,69E-5	3,4E-5	6,69E-4	2,27E-5	1,53E-6	MND	MND	MND	MND	MND	MND	MND	0E0	1,44E-7	1,07E-5	5,39E-6	-1,65E-4
Ozone depletion pot.	kg $CFC_{-11}e$	5,1E-8	5,37E-9	8,34E-10	5,72E-8	1,47E-8	7,89E-11	MND	MND	MND	MND	MND	MND	MND	0E0	5,57E-11	1,34E-9	3,12E-9	-1,38E-8
Acidification potential	mol H^+e	7,2E-3	7,77E-4	6,14E-5	8,04E-3	2,65E-4	4,17E-6	MND	MND	MND	MND	MND	MND	MND	0E0	1,64E-6	5,29E-5	8,78E-5	-3,08E-4
EP-freshwater[2)]	kg Pe	3,45E-5	1,28E-7	6,5E-7	3,53E-5	5,55E-7	6,99E-8	MND	MND	MND	MND	MND	MND	MND	0E0	3,03E-9	3,07E-7	1,89E-7	-1,35E-6
EP-marine	kg Ne	1,23E-3	1,92E-4	1,76E-5	1,44E-3	7,84E-5	6,72E-7	MND	MND	MND	MND	MND	MND	MND	0E0	5,98E-7	1,47E-5	5,37E-5	-4,89E-5
EP-terrestrial	mol Ne	1,37E-2	2,13E-3	1,97E-4	1,61E-2	8,66E-4	7,82E-6	MND	MND	MND	MND	MND	MND	MND	0E0	6,59E-6	1,6E-4	3,23E-4	-6,09E-4
POCP ("smog")[3)]	kg NMVOCe	6,69E-3	5,54E-4	6,25E-5	7,31E-3	2,72E-4	2,17E-6	MND	MND	MND	MND	MND	MND	MND	0E0	1,82E-6	5,18E-5	1,24E-4	-3,16E-4
ADP-minerals & metals[4)]	kg Sbe	1,79E-5	2,22E-7	2,29E-7	1,84E-5	1,6E-6	5,17E-9	MND	MND	MND	MND	MND	MND	MND	0E0	1,26E-8	2,26E-7	1,08E-7	-5,69E-7
ADP-fossil resources	MJ	7,08E1	3,44E-1	1,23E-1	7,13E1	9,81E-1	1,52E-2	MND	MND	MND	MND	MND	MND	MND	0E0	3,85E-3	1,81E-1	2,38E-1	-4,87E0
Water use[5)]	m^3e depr.	1,4E0	7,91E-4	3,26E-3	1,41E0	3,48E-3	1,89E-4	MND	MND	MND	MND	MND	MND	MND	0E0	1,58E-5	3,89E-3	1,06E-2	-6,66E-2

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) 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 experience with the 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[8)]	MJ	1,19E0	2,56E-3	3,04E0	4,23E0	1,39E-2	2,24E-3	MND	MND	MND	MND	MND	MND	MND	0E0	8,17E-5	8,94E-3	4,22E-3	-1,93E-1
Renew. PER as material	MJ	0E0	0E0	5,98E-1	5,98E-1	0E0	-5,98E-1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	1,19E0	2,56E-3	3,63E0	4,83E0	1,39E-2	-5,96E-1	MND	MND	MND	MND	MND	MND	MND	0E0	8,17E-5	8,94E-3	4,22E-3	-1,93E-1
Non-re. PER as energy	MJ	2,3E1	3,44E-1	1,12E-1	2,34E1	9,81E-1	1,52E-2	MND	MND	MND	MND	MND	MND	MND	0E0	3,85E-3	1,81E-1	2,38E-1	-2,46E0
Non-re. PER as material	MJ	4,78E1	0E0	1,12E-2	4,78E1	0E0	-1,12E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	-2,39E0	-4,54E1	-2,41E0
Total use of non-re. PER	MJ	7,08E1	3,44E-1	1,23E-1	7,13E1	9,81E-1	3,99E-3	MND	MND	MND	MND	MND	MND	MND	0E0	3,85E-3	-2,21E0	-4,52E1	-4,87E0
Secondary materials	kg	4,37E-3	0E0	3,53E-6	4,38E-3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	5,08E-2
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	5,1E-3	3,72E-5	6,84E-5	5,2E-3	1,86E-4	4,58E-6	MND	MND	MND	MND	MND	MND	MND	0E0	6,98E-7	5,44E-5	2,67E-4	-3,23E-4

8) 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	4,44E-2	3,93E-4	9,11E-4	4,57E-2	1,02E-3	5,51E-5	MND	MND	MND	MND	MND	MND	MND	0E0	5,46E-6	0E0	4,35E-4	-4,87E-4
Non-hazardous waste	kg	1,54E0	9,02E-3	2,2E-2	1,57E0	8,48E-2	3,28E-3	MND	MND	MND	MND	MND	MND	MND	0E0	2,38E-4	0E0	9,5E-1	-4,36E-2
Radioactive waste	kg	3,92E-5	2,4E-6	4,32E-7	4,2E-5	6,71E-6	9,54E-8	MND	MND	MND	MND	MND	MND	MND	0E0	2,56E-8	0E0	1,42E-6	-7,33E-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	3,3E-4	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	5E-2	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	7,3E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	2,57E-4	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	1,74E0	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	1,85E0	2,61E-2	9,24E-3	1,88E0	6,37E-2	7,88E-4	MND	MND	MND	MND	MND	MND	MND	0E0	2,55E-4	1,81E-2	9,94E-2	-1,46E-1
Ozone depletion Pot.	kg CFC_{-11}e	5,03E-8	4,25E-9	7,12E-10	5,53E-8	1,17E-8	8,34E-11	MND	MND	MND	MND	MND	MND	MND	0E0	4,45E-11	1,12E-9	2,48E-9	-1,22E-8
Acidification	kg SO_2e	6,06E-3	6,18E-4	4,37E-5	6,72E-3	1,31E-4	3,38E-6	MND	MND	MND	MND	MND	MND	MND	0E0	5,67E-7	3,33E-5	9,49E-5	-2,54E-4
Eutrophication	kg PO_4^3e	1,46E-3	6,92E-5	1,7E-5	1,55E-3	2,73E-5	2,31E-6	MND	MND	MND	MND	MND	MND	MND	0E0	1,35E-7	3,84E-5	4,96E-3	2,87E-5
POCP (“smog”)	kg C_2H_4e	6,07E-4	1,63E-5	2,95E-6	6,27E-4	8,47E-6	1,56E-7	MND	MND	MND	MND	MND	MND	MND	0E0	4,09E-8	3,15E-6	2,07E-5	-2,84E-5
ADP-elements	kg Sbe	1,79E-5	2,22E-7	2,29E-7	1,84E-5	1,6E-6	5,17E-9	MND	MND	MND	MND	MND	MND	MND	0E0	1,26E-8	2,26E-7	1,08E-7	-5,69E-7
ADP-fossil	MJ	7,08E1	3,44E-1	1,23E-1	7,13E1	9,81E-1	1,52E-2	MND	MND	MND	MND	MND	MND	MND	0E0	3,85E-3	1,81E-1	2,38E-1	-4,87E0

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

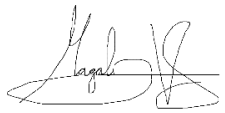
I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried 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.

Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited
30.06.2023



VERIFIED ISO 14025