ENVIRONMENTAL PRODUCT DECLARATION

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

Waterproof Flooring with Cork underlayment
CORKART

EPD HUB, HUB- 0624
Publishing date 7 August 2023, last updated on 7 August 2023, valid until 7 August 2028.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Corkart
Address	Parque Industrial de Vendas Novas, Lote 20, 7080-341 Vendas Novas PORTUGAL
Contact details	info@corkart.pt
Website	https://www.corkart.pt/

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 verification
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Khadija Benis, Greenlab
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	Waterproof Flooring with Cork underlayment
Place of production	Parque Industrial de Vendas Novas, Lote 20, 7080-341 Vendas Novas PORTUGAL (1 place)
Period for data	01/01/2022-31/12/2022
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	-%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m^2
Declared unit mass	9.36 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	21.5
GWP-total, A1-A3 ($kgCO_2e$)	20.4
Secondary material, inputs (%)	0.946
Secondary material, outputs (%)	0.0
Total energy use, A1-A3 (kWh)	87.7
Total water use, A1-A3 (m^3e)	0.139

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Corkart is a Portuguese family-owned company, founded in 1987, that produces floor coverings with different types of decorative finishes and underlayment, namely cork underlayment and IXPE (irradiation cross-linked polyethylene) foam underlayment. It is inserted in a group company Starcork that is dedicated to the production of cork components for floor and wall coverings.

PRODUCT DESCRIPTION

Floor covering with an SPC (Stone-Plastic Composite) core, cork underlayment, and a decorative layer along with a PVC wear layer and matte protective varnish topcoat.

Further information can be found at https://www.corkart.pt/.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0	-
Minerals	65.4	Portugal
Fossil materials	26.6	Portugal, Mexico, China
Bio-based materials	8	Portugal, China

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0.3432
Biogenic carbon content in packaging, kg C	0.001436

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 m^2
Mass per declared unit	9.36 kg
Functional unit	-
Reference service life	-

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.

The raw materials are transported by lorry (one leg transport) in the cases where the material comes from Portugal, or by lorry and container ship (two leg transport), in the cases where the material or part of it comes either from Mexico or China. The packaging materials are transported by lorry from the supplier to the manufacturing facility. Both for raw materials and packaging materials, no empty returns were considered, since it's assumed that the transport is used for other goods on the way back unrelated to the study at hand.

The electricity used in the manufacturing process comes from two sources: medium voltage network electricity (Portugal mix), and electricity from a photovoltaic slanted roof panel installation located in the manufacturing installations.

The manufacturing process is shown in the flow diagram on page 6. It is comprised of the following stages: weighing, hot mixing, cold mixing, extrusion / plastification, mould / lamination / first cutting, brushing / varnish / drying, insulation, final cutting, and packaging.
During the weighing the SPC core components calcium carbonate, PVC resin and additives are weighted to fulfil the right proportions per batch.
During hot mixing, the raw materials are mixed at high temperatures, followed by cold mixing, where the mixture is refrigerated by a closed-circuit water loop.

Next comes extrusion of the mixture into the desired width and thickness, followed by the application of the decor printed film and wear layer which is moulded into the desired texture, followed by cutting.
During brushing/varnish/drying step, the product is brushed to remove any dust off its surface, then a protective varnish topcoat is applied, which is dried by the action of UV lamps.

Next, during the insulation stage, the cork underlayment is applied, followed by a final cutting of the product. Then, the product is packaged in a cardboard box, then in a LDPE sealed bag and placed on a wood pellet, together with other identical packages.

The raw materials losses are already accounted for in the raw material quantities. The only accounted ancillary material is tap water used in the closed loop refrigeration system for the hot mixture. The waste produced during the manufacturing process includes the raw materials packaging (cardboard, plastic bags, bulk bags), and calcium carbonate and PVC resin

waste. The cardboard, plastic bags are sent to recycling to an external entity. The bulk bags are reused internally in the factory, after which they are treated like common urban waste. The calcium carbonate and PVC resin manufacturing waste is recycled internally in the factory with a 100% efficiency.

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.

For the distance of transportation of the final packaged product to the installation site, a weighted value was obtained from the distance to different sites and corresponding production shares. Two types of transport are used: lorry and container ship.

There are no materials and energy consumptions, as well as material loss, to consider during installation.

Installation waste is comprised of the packaging of the product: cardboard, LDPE, and wood pellets. The materials are sent to recycling. The distance of transportation to the sorting and recycling facilities is unknown, so a conservative distance of 50 km was assumed.

PRODUCT USE AND MAINTENANCE (B1-B7)

Impacts from modules B1-B7 are not included in the scope of this EPD.
Air, soil, and water impacts during the use phase have not been studied.

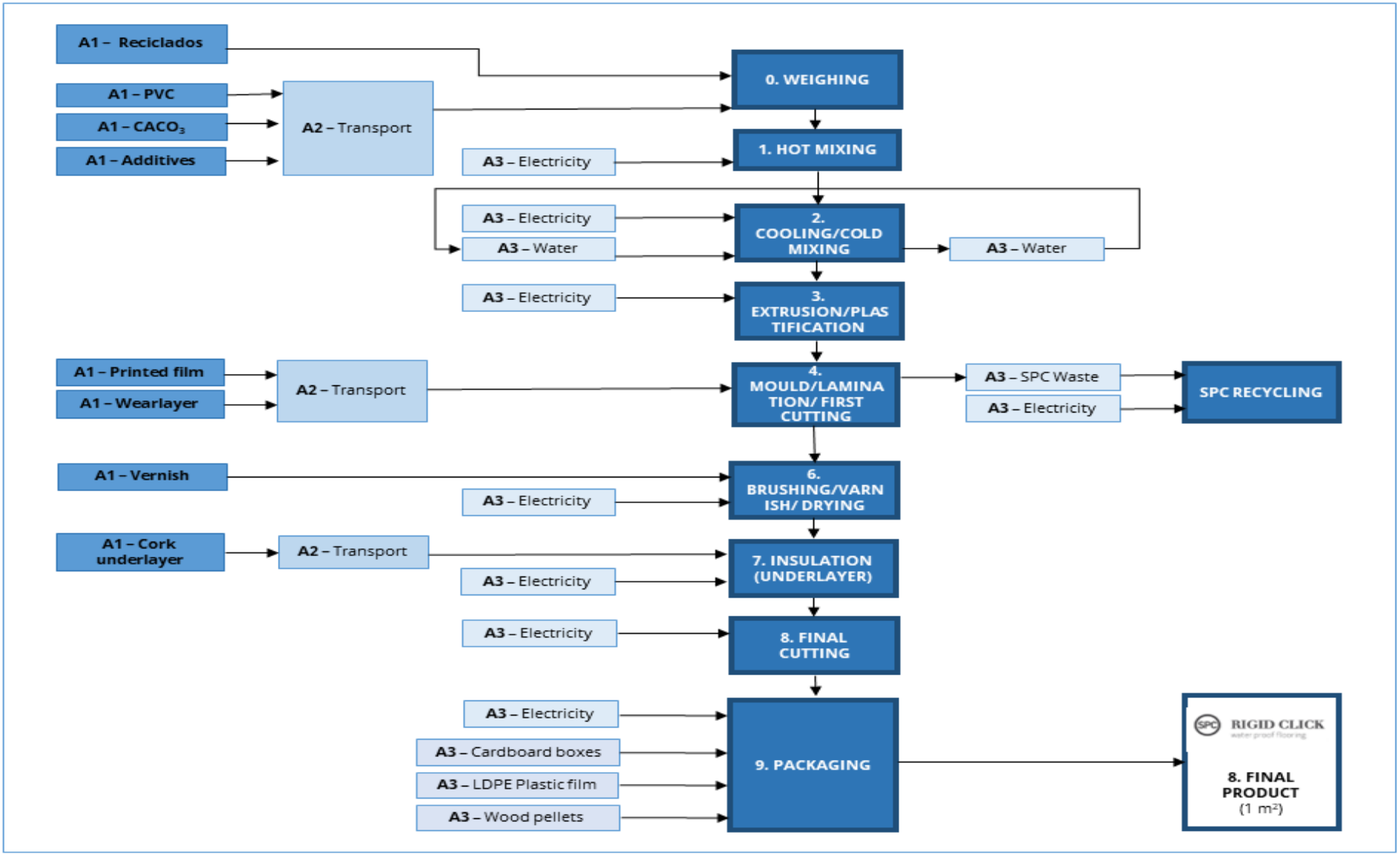
PRODUCT END OF LIFE (C1-C4, D)

Concerning deconstruction, the amount of energy spent by the building machines used in demolition is assumed to be 0.01kWh/kg (Bozdag, 2007). So, 0.01 kWh/kg was multiplied by the mass of the declared unit to obtain the total energy spent by the machines to deconstruct one declared unit of product: 0.01 kWh/kg * 9.36 kg = 0.0936 kWh.

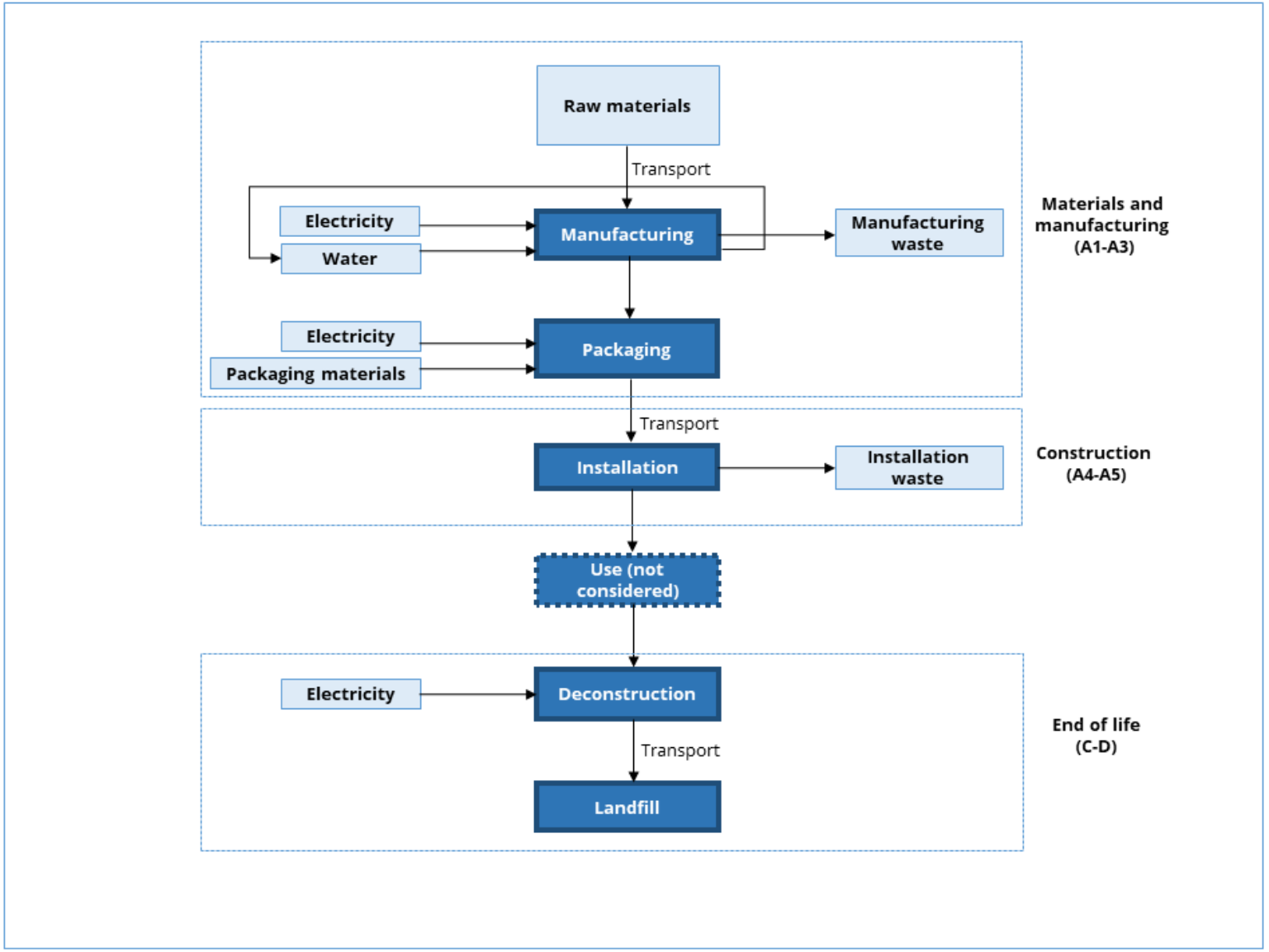
The exact distance to the waste treatment facilities is unknown, so the conservative value of 50 km was assumed.

For the end-of-life scenario, since the product is a composite material that is hard to separate, it was considered that it is treated as a common mixture of demolition waste that goes into sanitary landfill, in the district of Évora, in Portugal. For this reason, there is no waste processing for reuse, recovery or recycling (module C3), and no benefits and loads beyond the system boundary (module D) in the end-of-life scenario.

MANUFACTURING PROCESS



LIFE CYCLE FLOW DIAGRAM



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	Allocated by mass or volume
Packaging materials	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	-

This EPD is product and factory specific and does not contain average calculations.

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 database version 3.8 and One Click LCA database 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	1,55E1	6,27E-1	4,32E0	2,04E1	1,52E0	3,27E-2	MND	MND	MND	MND	MND	MND	MND	3,09E-2	2,4E-1	0E0	4,89E0	0E0
GWP – fossil	kg CO_2e	1,66E1	6,26E-1	4,29E0	2,15E1	1,52E0	7,86E-3	MND	MND	MND	MND	MND	MND	MND	3,09E-2	2,4E-1	0E0	4,31E0	0E0
GWP – biogenic	kg CO_2e	-1,19E0	1,16E-4	4,92E-3	-1,19E0	7,58E-4	2,48E-2	MND	MND	MND	MND	MND	MND	MND	8,58E-6	1,1E-4	0E0	5,76E-1	0E0
GWP – LULUC	kg CO_2e	4,17E-2	3,12E-4	3,11E-2	7,31E-2	5,72E-4	6,66E-6	MND	MND	MND	MND	MND	MND	MND	2,61E-6	1,35E-4	0E0	6,76E-4	0E0
Ozone depletion pot.	kg $CFC_{-11}e$	3,77E-6	1,35E-7	2,57E-7	4,17E-6	3,44E-7	1,03E-9	MND	MND	MND	MND	MND	MND	MND	6,66E-9	5,15E-8	0E0	2,22E-7	0E0
Acidification potential	mol H^+e	5,81E-2	9,55E-3	2,31E-2	9,08E-2	6,45E-3	4,32E-5	MND	MND	MND	MND	MND	MND	MND	3,23E-4	7,03E-4	0E0	6,43E-3	0E0
EP-freshwater[2)]	kg Pe	6,41E-4	4,31E-6	1,66E-4	8,12E-4	1,26E-5	1,69E-7	MND	MND	MND	MND	MND	MND	MND	1,25E-7	2,83E-6	0E0	5,97E-5	0E0
EP-marine	kg Ne	9,81E-3	2,3E-3	3,42E-3	1,55E-2	1,39E-3	1,63E-5	MND	MND	MND	MND	MND	MND	MND	1,43E-4	1,26E-4	0E0	1,96E-3	0E0
EP-terrestrial	mol Ne	1,04E-1	2,55E-2	3,7E-2	1,67E-1	1,55E-2	1,42E-4	MND	MND	MND	MND	MND	MND	MND	1,56E-3	1,41E-3	0E0	1,39E-2	0E0
POCP ("smog")[3)]	kg NMVOCe	3,5E-2	6,91E-3	1,04E-2	5,23E-2	5,15E-3	4,79E-5	MND	MND	MND	MND	MND	MND	MND	4,3E-4	5,44E-4	0E0	5,1E-3	0E0
ADP-minerals & metals[4)]	kg Sbe	3,4E-4	1,22E-5	4,3E-5	3,95E-4	4,05E-5	1,39E-7	MND	MND	MND	MND	MND	MND	MND	4,71E-8	1,18E-5	0E0	2,17E-5	0E0
ADP-fossil resources	MJ	2,63E2	8,84E0	4,57E1	3,18E2	2,28E1	1,11E-1	MND	MND	MND	MND	MND	MND	MND	4,25E-1	3,56E0	0E0	1,15E1	0E0
Water use[5)]	m^3e depr.	1,23E1	2,52E-2	3,59E0	1,59E1	7,36E-2	1,8E-3	MND	MND	MND	MND	MND	MND	MND	7,92E-4	1,47E-2	0E0	3,91E0	0E0

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.

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	3,52E-7	3,11E-8	3,11E-7	6,95E-7	9,45E-8	1,46E-9	MND	MND	MND	MND	MND	MND	MND	8,55E-9	1,14E-8	0E0	1,88E-6	0E0
Ionizing radiation[6)]	kBq U235e	8,33E-1	3,84E-2	1,48E-1	1,02E0	9,97E-2	3,57E-4	MND	MND	MND	MND	MND	MND	MND	1,82E-3	1,56E-2	0E0	3,73E-2	0E0
Ecotoxicity (freshwater)	CTUe	2,64E2	6,38E0	7,79E1	3,48E2	1,76E1	1,46E-1	MND	MND	MND	MND	MND	MND	MND	2,49E-1	3,16E0	0E0	1,83E2	0E0
Human toxicity, cancer	CTUh	8,59E-9	2,72E-10	7,82E-9	1,67E-8	5,29E-10	2,25E-11	MND	MND	MND	MND	MND	MND	MND	8,92E-12	1,12E-10	0E0	5,16E-8	0E0
Human tox. non-cancer	CTUh	3,1E-7	6,4E-9	5,93E-8	3,76E-7	1,91E-8	2,28E-10	MND	MND	MND	MND	MND	MND	MND	2,2E-10	3,24E-9	0E0	8,75E-8	0E0
SQP[7)]	-	1,47E1	4,72E0	4,48E0	2,39E1	1,86E1	7,79E-2	MND	MND	MND	MND	MND	MND	MND	1,09E-2	1,88E0	0E0	5,57E0	0E0

6) 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; 7) SQP = Land use related impacts/soil quality.

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	3,33E1	1,02E-1	1,86E1	5,2E1	3,2E-1	4,46E-3	MND	MND	MND	MND	MND	MND	MND	2,3E-3	7,63E-2	0E0	2,35E0	0E0
Renew. PER as material	MJ	5,85E0	0E0	1,48E-1	6E0	0E0	-9,7E-1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	-6,92E0	0E0
Total use of renew. PER	MJ	3,91E1	1,02E-1	1,87E1	5,8E1	3,2E-1	-9,66E-1	MND	MND	MND	MND	MND	MND	MND	2,3E-3	7,63E-2	0E0	-4,56E0	0E0
Non-re. PER as energy	MJ	2,1E2	8,85E0	4,47E1	2,64E2	2,28E1	1,11E-1	MND	MND	MND	MND	MND	MND	MND	4,25E-1	3,56E0	0E0	1,15E1	0E0
Non-re. PER as material	MJ	5,38E1	0E0	-7,11E0	4,67E1	0E0	-9,6E-1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	-4,53E1	0E0
Total use of non-re. PER	MJ	2,64E2	8,85E0	3,76E1	3,1E2	2,28E1	-8,49E-1	MND	MND	MND	MND	MND	MND	MND	4,25E-1	3,56E0	0E0	-3,37E1	0E0
Secondary materials	kg	8,07E-2	0E0	7,76E-3	8,85E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
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	1,05E-1	1,27E-3	3,27E-2	1,39E-1	3,87E-3	2,76E-5	MND	MND	MND	MND	MND	MND	MND	3,75E-5	6,51E-4	0E0	1,15E-1	0E0

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	6,72E-1	9,62E-3	3,26E-1	1,01E0	2,36E-2	4,73E-4	MND	MND	MND	MND	MND	MND	MND	4,57E-4	5,1E-3	0E0	7,18E-1	0E0
Non-hazardous waste	kg	2,6E1	4,39E-1	6,99E0	3,34E1	1,57E0	1,94E-2	MND	MND	MND	MND	MND	MND	MND	4,88E-3	2,23E-1	0E0	7,73E0	0E0
Radioactive waste	kg	7,21E-4	6,12E-5	1,33E-4	9,15E-4	1,56E-4	4,9E-7	MND	MND	MND	MND	MND	MND	MND	2,97E-6	2,37E-5	0E0	4,34E-5	0E0

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	2,77E-1	0E0	0E0	2,77E-1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	1,23E-3	0E0	6,99E0	6,99E0	0E0	7,47E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for energy rec	kg	3,81E-2	0E0	0E0	3,81E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	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	1,58E1	6,21E-1	4,15E0	2,06E1	1,51E0	1,63E-2	MND	MND	MND	MND	MND	MND	MND	3,06E-2	2,38E-1	0E0	4,57E0	0E0
Ozone depletion Pot.	kg CFC_{-11}e	5,41E-6	1,07E-7	2,25E-7	5,74E-6	2,74E-7	8,39E-10	MND	MND	MND	MND	MND	MND	MND	5,27E-9	4,12E-8	0E0	2,96E-7	0E0
Acidification	kg SO_2e	4,9E-2	7,54E-3	2,08E-2	7,74E-2	4,76E-3	3,56E-5	MND	MND	MND	MND	MND	MND	MND	4,55E-5	5,26E-4	0E0	1,48E-2	0E0
Eutrophication	kg PO_4^3e	2,11E-2	9,09E-4	6,26E-3	2,83E-2	8,09E-4	6,98E-5	MND	MND	MND	MND	MND	MND	MND	8,02E-6	1,26E-4	0E0	9,6E-3	0E0
POCP (“smog”)	kg C_2H_4e	3,84E-3	2,21E-4	9,13E-4	4,97E-3	2,23E-4	5,29E-6	MND	MND	MND	MND	MND	MND	MND	4,69E-6	3,15E-5	0E0	1,11E-3	0E0
ADP-elements	kg Sbe	3,4E-4	1,22E-5	4,3E-5	3,95E-4	4,05E-5	1,39E-7	MND	MND	MND	MND	MND	MND	MND	4,71E-8	1,18E-5	0E0	2,17E-5	0E0
ADP-fossil	MJ	2,63E2	8,84E0	4,57E1	3,18E2	2,28E1	1,11E-1	MND	MND	MND	MND	MND	MND	MND	4,25E-1	3,56E0	0E0	1,15E1	0E0

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

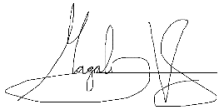
I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried 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
07.08.2023



VERIFIED ISO 14025