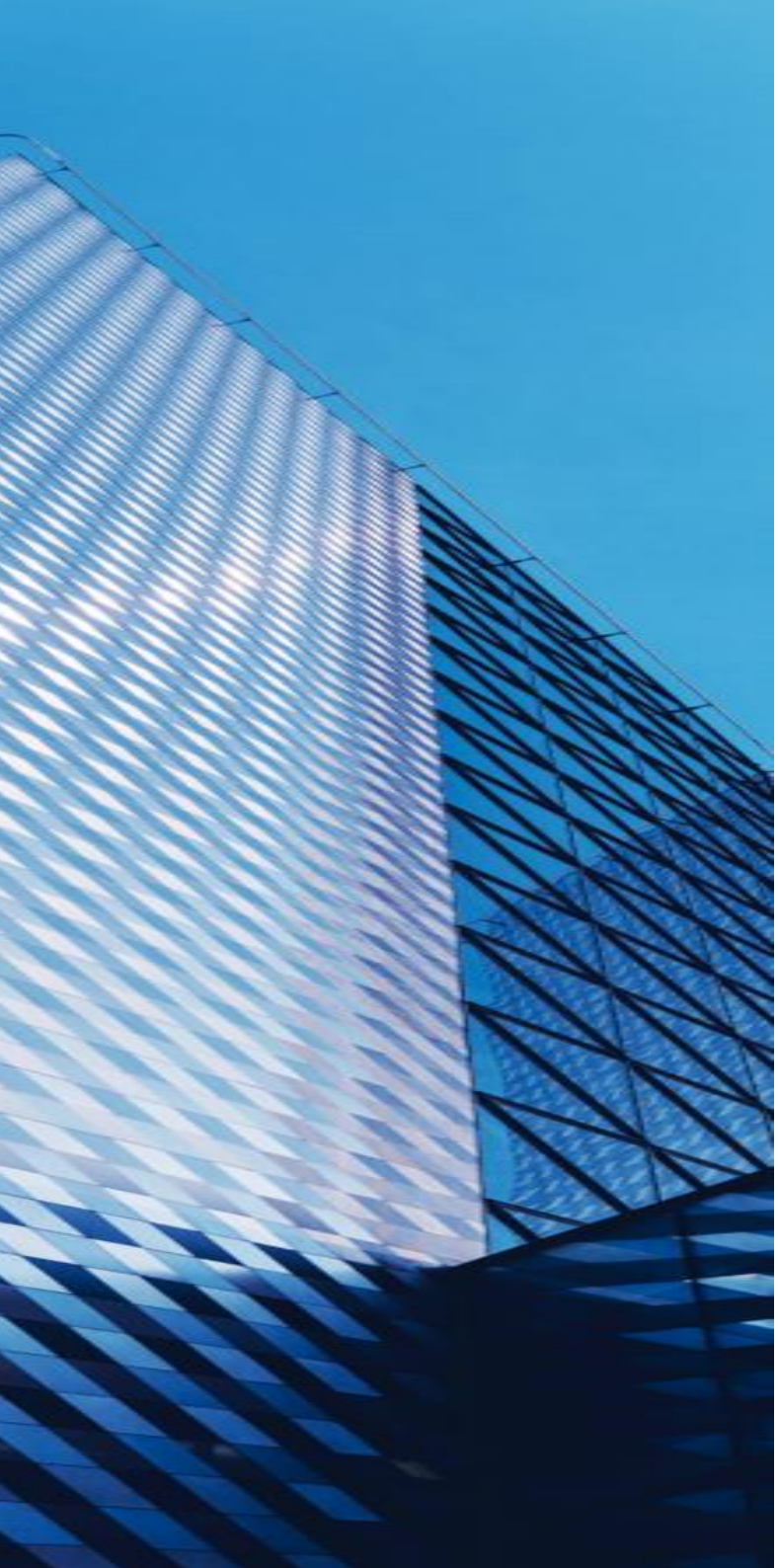


ENVIRONMENTAL PRODUCT DECLARATION

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

iCell Blown-In Insulation
RS Ecosaver AB / iCell

EPD HUB, HUB-1777
Published on 15 July 2024, last updated on 15 July 2024, valid until 15 July 2029.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	RS Ecosaver AB / iCell
Address	Klorbergsvägen 14, 79691 Älvdalen Sweden
Contact details	info@icell.se
Website	https://icell.se

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 1.1, 5 Dec 2023 EN 16783 Thermal insulation products
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	iCell - Ove Grönberg
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Haiha Nguyen, 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	iCell Blown-In Insulation
Additional labels	
Product reference	7350081770532
Place of production	Aelvdalen, Sweden
Period for data	2022-2023
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	-

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	1,93E-01
GWP-total, A1-A3 (kgCO2e)	-1,27E+00
Secondary material, inputs (%)	0.02
Secondary material, outputs (%)	0
Total energy use, A1-A3 (kWh)	1.13
Net fresh water use, A1-A3 (m3)	0

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

RS Ecosaver AB is a Swedish company that contains and produces insulation under the brand iCell. iCell has been one of Sweden's largest bio-based insulation products since 2010. The company's main purpose is to produce insulation against heat and cold from recycled newspapers that can contribute to a better and healthier indoor climate.

PRODUCT DESCRIPTION

iCell cellulose insulation are manufactured by recycled newspaper and made for thermal and sound insulation in building construction with additives. The Blown-In Insulation can be used in attics, floors, pitched cavities, vertical cavities, sprayed wall applications. The considered service lifetime is 50 years

LCA information
Functional unit / declared unit: Thermal insulation of 1 m³ with iCell Loose wool, with a lambda value of 0,039 W/mK, with a design life span of 50 years, for different applications.

Application Density
Attic (open blow) 26-36 kg/m³
Floor (horizontal cavities) 45 kg/m³
Pitched cavities 45 kg/m³
Vertical cavities 55 kg/m³
Sprayed wall 35-40 kg/m³

Depending on the application, and its required density, the reference flow (quantity of product to fulfil the functional unit) is different and declared in the previous table. In this manner, the results presented in this report for a declared unit of 1 kg. Depending on the application, a conversion factor may be used.

Reference service life: 50 years
Time representativeness: 202204-2305

Description of system boundaries: Cradle to grave

Cellulose thermal insulation is composed by sorted paper and newspaper with additives. Raw materials transport is considered, mainly truck transport. The raw materials are added in the manufacturing stage, electricity and fuel consumption are considered. The product is packed and distributed to the final client; distribution transportation is volume based. Installation is considered for loose fill cellulose insulation, as blowing the product. The product has 50 years lifespan, and it is assumed 100% recycled at its end of life.

Further information can be found at https://icell.se.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0	
Minerals	7	Bor acid 3% - Turkey, Magnesiumhydroxid 4% - Germany
Fossil materials	0	
Bio-based materials	93	Recycled Newspaper - Sweden

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0.36465
Biogenic carbon content in packaging, kg C	0.00292

FUNCTIONAL UNIT AND SERVICE LIFE

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

SUBSTANCES, REACH - VERY HIGH CONCERN

Substances of very high concern	EC	CAS
Boric acid	233-139-2	10043-35-3

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.

iCell loose fill insulation is manufactured from recycled newspapers, during the process through the shredder and mills a fire and growth to mould retardants are added. The final product are packed in a polyetenbags of approx 14 kg and delivered on reusable pallets of 24 bags per pallets. Waste production in manufacturing is dust from the mill.

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.

iCell loose fill insulation will be delivered to the construction trade or the construction site with trucks or trailers. The trucks are loaded with 48 pallets and the trailers are loaded with 33 pallets. The average distances for transport of the insulation to constructions site or trade is about 450 km one way.

iCell loose fill insulation is applied by a blow machine. The installer decides the best method for the object at the moment. At the installation moment there will be no waste of material. Packaging waste that is generated and its treatment is considered in installation process in calculation.

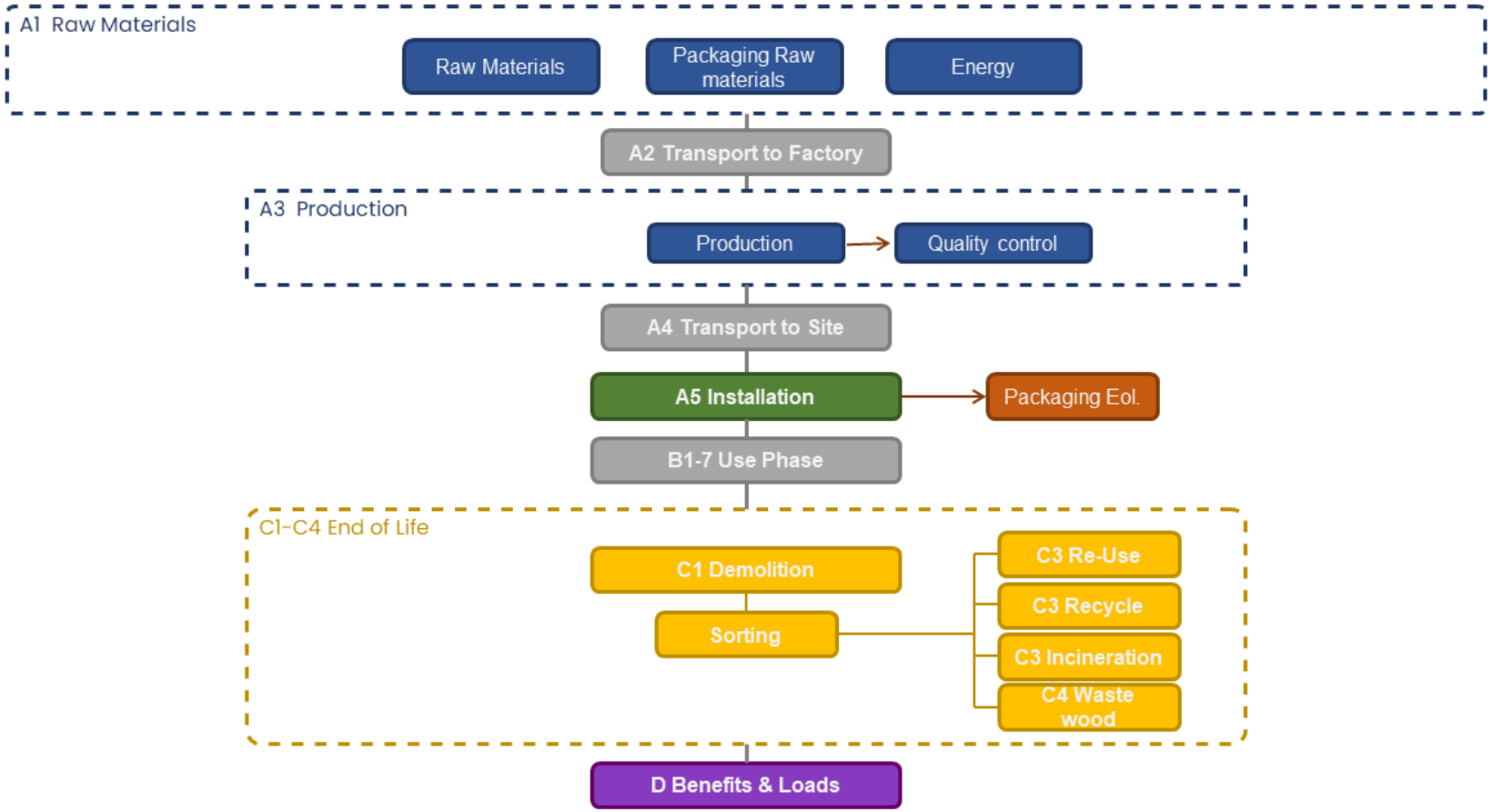
PRODUCT USE AND MAINTENANCE (B1-B7)

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)

Currently, cellulose insulation is handled as landfill just like mineral wool in Sweden after it has been assembled.
However, iCell can reuse disassembled loose wool in its production of cellulosic sheets. Therefore, iCell, together with recycling companies in Sweden, is investigating the possibility of collecting dismantled insulation for reuse.

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. 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	No allocation
Ancillary materials	Not applicable
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	-

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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. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases 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	-1,28E+00	3,49E-02	-2,05E-02	-1,27E+00	4,33E-02	1,69E-01	MND	MND	MND	MND	MND	MND	MND	MNR	4,69E-03	0,00E+00	1,36E+00	-3,63E-02
GWP – fossil	kg CO_2e	5,96E-02	3,49E-02	9,89E-02	1,93E-01	4,32E-02	4,84E-02	MND	MND	MND	MND	MND	MND	MND	MNR	4,69E-03	0,00E+00	2,37E-02	-3,65E-02
GWP – biogenic	kg CO_2e	-1,34E+00	0,00E+00	-1,20E-01	-1,46E+00	0,00E+00	1,20E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	1,34E+00	2,14E-04
GWP – LULUC	kg CO_2e	3,29E-05	1,29E-05	5,11E-04	5,57E-04	1,60E-05	1,07E-03	MND	MND	MND	MND	MND	MND	MND	MNR	1,73E-06	0,00E+00	3,31E-05	-1,61E-05
Ozone depletion pot.	kg CFC_{-11}e	2,52E-09	8,05E-09	5,78E-09	1,63E-08	9,95E-09	9,38E-10	MND	MND	MND	MND	MND	MND	MND	MNR	1,08E-09	0,00E+00	3,58E-09	-1,45E-09
Acidification potential	mol H^+e	5,19E-04	1,47E-04	4,86E-04	1,15E-03	1,83E-04	1,24E-04	MND	MND	MND	MND	MND	MND	MND	MNR	1,99E-05	0,00E+00	2,36E-04	-2,22E-04
EP-freshwater[2)]	kg Pe	1,23E-06	2,85E-07	3,83E-06	5,34E-06	3,54E-07	8,81E-07	MND	MND	MND	MND	MND	MND	MND	MNR	3,84E-08	0,00E+00	1,34E-06	-1,32E-06
EP-marine	kg Ne	5,55E-05	4,36E-05	1,12E-04	2,11E-04	5,44E-05	2,62E-05	MND	MND	MND	MND	MND	MND	MND	MNR	5,90E-06	0,00E+00	2,06E-03	-2,85E-05
EP-terrestrial	mol Ne	6,45E-04	4,81E-04	1,24E-03	2,36E-03	6,00E-04	3,07E-04	MND	MND	MND	MND	MND	MND	MND	MNR	6,51E-05	0,00E+00	5,73E-04	-3,29E-04
POCP ("smog")[3)]	kg NMVOCe	1,96E-04	1,54E-04	4,91E-04	8,40E-04	1,92E-04	7,55E-05	MND	MND	MND	MND	MND	MND	MND	MNR	2,08E-05	0,00E+00	5,78E-04	-1,14E-04
ADP-minerals & metals[4)]	kg Sbe	4,20E-05	8,20E-08	6,49E-07	4,27E-05	1,01E-07	1,06E-06	MND	MND	MND	MND	MND	MND	MND	MNR	1,10E-08	0,00E+00	8,49E-08	-1,02E-07
ADP-fossil resources	MJ	4,10E-01	5,25E-01	3,05E+00	3,98E+00	6,50E-01	2,09E+00	MND	MND	MND	MND	MND	MND	MND	MNR	7,05E-02	0,00E+00	3,87E-01	-7,85E-01
Water use[5)]	m^3e depr.	3,24E-02	2,35E-03	9,58E-02	1,31E-01	2,91E-03	8,10E-02	MND	MND	MND	MND	MND	MND	MND	MNR	3,15E-04	0,00E+00	4,42E-03	-1,03E-02

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	4,19E-02	5,94E-03	1,07E+00	1,12E+00	7,32E-03	8,60E-01	MND	MND	MND	MND	MND	MND	MND	MNR	7,94E-04	0,00E+00	2,24E-02	-5,35E-02
Renew. PER as material	MJ	1,32E+01	0,00E+00	1,05E+00	1,42E+01	0,00E+00	-1,05E+00	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	-1,32E+01	1,21E-04
Total use of renew. PER	MJ	1,32E+01	5,94E-03	2,12E+00	1,54E+01	7,32E-03	-1,91E-01	MND	MND	MND	MND	MND	MND	MND	MNR	7,94E-04	0,00E+00	-1,32E+01	-5,34E-02
Non-re. PER as energy	MJ	4,10E-01	5,25E-01	1,97E+00	2,90E+00	6,50E-01	2,08E+00	MND	MND	MND	MND	MND	MND	MND	MNR	7,05E-02	0,00E+00	3,87E-01	-4,53E-01
Non-re. PER as material	MJ	0,00E+00	0,00E+00	1,08E+00	1,08E+00	0,00E+00	-1,08E+00	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	3,30E-01
Total use of non-re. PER	MJ	4,10E-01	5,25E-01	3,05E+00	3,98E+00	6,50E-01	1,00E+00	MND	MND	MND	MND	MND	MND	MND	MNR	7,05E-02	0,00E+00	3,87E-01	-1,23E-01
Secondary materials	kg	1,94E-04	1,46E-04	4,32E-03	4,65E-03	1,80E-04	2,29E-04	MND	MND	MND	MND	MND	MND	MND	MNR	1,96E-05	0,00E+00	1,05E-04	8,22E-03
Renew. secondary fuels	MJ	1,51E-06	1,47E-06	3,63E-02	3,63E-02	1,82E-06	1,13E-06	MND	MND	MND	MND	MND	MND	MND	MNR	1,97E-07	0,00E+00	3,73E-06	-1,29E-07
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	7,97E-04	6,81E-05	2,37E-03	3,23E-03	8,41E-05	2,03E-03	MND	MND	MND	MND	MND	MND	MND	MNR	9,13E-06	0,00E+00	3,46E-04	-3,74E-04

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	1,48E-03	6,94E-04	5,64E-03	7,82E-03	8,61E-04	1,82E-03	MND	MND	MND	MND	MND	MND	MND	MNR	9,34E-05	0,00E+00	0,00E+00	-2,03E-03
Non-hazardous waste	kg	5,69E-02	1,14E-02	1,35E-01	2,03E-01	1,41E-02	1,16E-01	MND	MND	MND	MND	MND	MND	MND	MNR	1,54E-03	0,00E+00	1,00E+00	-8,78E-02
Radioactive waste	kg	2,07E-06	3,52E-06	1,38E-05	1,94E-05	4,35E-06	3,18E-05	MND	MND	MND	MND	MND	MND	MND	MNR	4,71E-07	0,00E+00	0,00E+00	-1,32E-06

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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,42E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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	5,89E-02	3,46E-02	9,59E-02	1,89E-01	4,28E-02	5,09E-02	MND	MND	MND	MND	MND	MND	MND	MNR	4,64E-03	0,00E+00	1,20E+00	-3,51E-02
Ozone depletion Pot.	kg CFC_{-11}e	2,08E-09	6,38E-09	4,82E-09	1,33E-08	7,88E-09	8,30E-10	MND	MND	MND	MND	MND	MND	MND	MNR	8,55E-10	0,00E+00	2,86E-09	-1,19E-09
Acidification	kg SO_2e	4,47E-04	1,14E-04	3,90E-04	9,51E-04	1,42E-04	9,80E-05	MND	MND	MND	MND	MND	MND	MND	MNR	1,54E-05	0,00E+00	1,91E-04	-1,89E-04
Eutrophication	kg PO_4^3e	2,65E-04	2,60E-05	1,59E-04	4,50E-04	3,24E-05	1,71E-04	MND	MND	MND	MND	MND	MND	MND	MNR	3,52E-06	0,00E+00	3,29E-03	-4,84E-05
POCP (“smog”)	kg C_2H_4e	2,14E-05	4,48E-06	4,93E-05	7,52E-05	5,55E-06	5,14E-06	MND	MND	MND	MND	MND	MND	MND	MNR	6,03E-07	0,00E+00	2,59E-04	-1,08E-05
ADP-elements	kg Sbe	5,24E-07	7,94E-08	6,44E-07	1,25E-06	9,82E-08	1,06E-06	MND	MND	MND	MND	MND	MND	MND	MNR	1,07E-08	0,00E+00	8,34E-08	-1,02E-07
ADP-fossil	MJ	4,09E-01	5,25E-01	3,05E+00	3,98E+00	6,50E-01	2,08E+00	MND	MND	MND	MND	MND	MND	MND	MNR	7,05E-02	0,00E+00	3,87E-01	-7,84E-01

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.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited
15.07.2024

VERIFIED ISO 14025