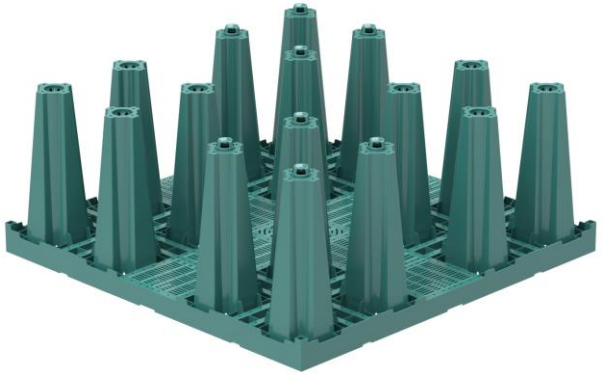
ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Rigofill ST-Advanced - SWH
FRÄNKISCHE Rohrwerke Gebr. Kirchner GmbH & Co. KG



EPD HUB, HUB-3702
Published on 24.07.2025, last updated on 24.07.2025, valid until 24.07.2030

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.1 (5 Dec 2023) and JRC characterization factors EF 3.1.

Created with One Click LCA

FRÄNKISCHE

GENERAL INFORMATION

MANUFACTURER

Manufacturer	FRÄNKISCHE Rohrwerke Gebr. Kirchner GmbH & Co. KG
Address	Hellinger Str. 1, 97486 Königsberg / Germany
Contact details	info@fraenkische.de
Website	https://www.fraenkische.com/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.1, 5 Dec 2023
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	Stefan Weiss
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Imane Uald Lamkaddam as an authorized verifier for EPD Hub

This EPD is intended for business-to-business and/or business-to-consumer communication. 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	Rigofill ST-Advanced
Additional labels	In 2024 product name was changed from Rigofill ST to Rigofill ST-A
Product reference	51594500
Place(s) of raw material origin	Germany
Place of production	Schwarzheide, Germany
Place(s) of installation and use	Worldwide but main business is in Europe, purpose is to build a basin for Infiltration, detention and harvesting applications
Period for data	01.05.2023 - 30.04 2024
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	+14%
A1-A3 Specific data (%)	50,1

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit of Rigofill ST-A - Basic Element
Declared unit mass	9,55 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	4,13E+00
GWP-total, A1-A3 ($kgCO_2e$)	3,11E+00
Secondary material, inputs (%)	80,1
Secondary material, outputs (%)	40,3
Total energy use, A1-A3 (kWh)	62,1
Net freshwater use, A1-A3 (m^3)	0,04

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

FRÄNKISCHE Rohrwerke Gebr. Kirchner GmbH & Co. KG is a German company based in Königsberg, Bavaria, specializing in the development and production of a wide range of pipes, system components, and accessories for drainage systems, electrical installations, and building services. Founded in 1906, the company has been family-owned by the Kirchner family since 1919 and operates as a wholly owned subsidiary of FRÄNKISCHE Group SE.

FRÄNKISCHE is recognized as the world's first manufacturer of corrugated pipes and maintains a strong international presence with 17 production and sales locations worldwide. The group employs around 5,800 people, all contributing to innovative solutions for infrastructure, construction, and industrial applications.

PRODUCT DESCRIPTION

Rigofill ST-A elements are injection-molded parts used to assemble complete blocks measuring 80 cm × 80 cm × 66 cm or 80 cm × 80 cm × 35 cm. These blocks are combined to create a modular underground storage system, with as many units assembled as required to meet the required storage volume. The application of the basins ranges from infiltration to storage, with storage applications including detention, reuse, and fire-fighting water reserves. In addition to their high strength, high void ratio, and modularity, the stackability of the elements offers a significant advantage for this type of product. Since the system must be assembled on-site, the product is stored compactly on pallets and can be transported, stored, and handled in a space-saving manner, whether at the manufacturer's premises, at the dealer's warehouse, or on the construction site. This results in significantly lower CO_2 emissions compared to pre-assembled product types. The reduced space requirements on trucks also help to minimize emissions during transportation from the manufacturing site to the construction site, as four times fewer deliveries are ultimately needed.
Further information can be found at:
https://www.fraenkische.com/

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	0	-
Minerals	22,5	EU
Fossil materials	77,5	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	0,35

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 unit of Rigofill ST-A - Basic Element
Mass per declared unit	9,55 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		
×	×	×	×	×	MND	MND	MND	MND	MND	MND	MND	×	×	×	×	×		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	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.

A market-based approach is used in modelling the electricity mix utilized in the factory.

The product is made from recycled polypropylene with added filler materials, based on recycled PP. The raw materials are transported to the production site by lorry, transport distances depending on supplier locations. These materials are mixed directly in the injection molding machine, where they are simultaneously heated and homogenized just before injection to ensure consistent quality and material performance.
During the manufacturing process, a production loss of around 5% occurs; however, this material is not discarded but fully reintegrated into the subsequent production cycles, ensuring resource efficiency and eliminating external waste. As a result, no relevant waste is generated during manufacturing (Module A3), and no transport of A3 waste is required. The energy required for the production process is supplied from the public electricity grid (grid energy), reflecting the current national energy mix, which includes renewable and non-renewable sources.
After production, the finished product is packed on one-way pallets and secured with polyester fiber straps for stability during storage and transport. A full stack consists of two pallets placed one on top of the other to optimize logistics efficiency. The packed products are delivered by truck directly to the construction site.

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 transportation distance is assumed to be the distance from the production plant to the region within each country that receives the highest volume of deliveries. In our case, both product types (ST-A and ST-S), which are produced at the same site in Schwarzheide, Germany, are typically delivered to the same regions, and therefore, identical transport distances are assumed for both. The mode of transportation is by lorry. To calculate the

average transportation distance across all European countries, the country-specific sales volumes during the defined period were taken into account. Based on this, an average transport distance of 660 km was determined. Empty return trips are not considered, as it is assumed that the transportation company uses the return journey to serve other clients. Transportation does not result in product losses, as the products are properly packaged. Furthermore, for the nested packaged products, a volume capacity utilization factor of 100% is assumed. Once delivered to the construction site, the products are brought into the excavation pit either by hand (when moved piece by piece) or with a crane, wheel loader, or excavator when entire pallets are handled. Final assembly is carried out manually in the excavation pit without the need for installation aids. Due to the modular design and predefined sizing of the elements, there are no material losses during installation. Energy consumption during installation is not applicable, as the process is entirely manual and does not require external power sources. Waste generated during installation (Module A5) is limited to packaging materials, such as one-way pallets, wooden boards, and plastic fiber straps. The proportion of this packaging waste is estimated to be less than 5% per unit. The resulting A5 waste is assumed to be transported by lorry to the nearest appropriate waste treatment facility, located approximately 50 km away. These values and assumptions are aligned with standard installation practices and lifecycle assessment methodologies.

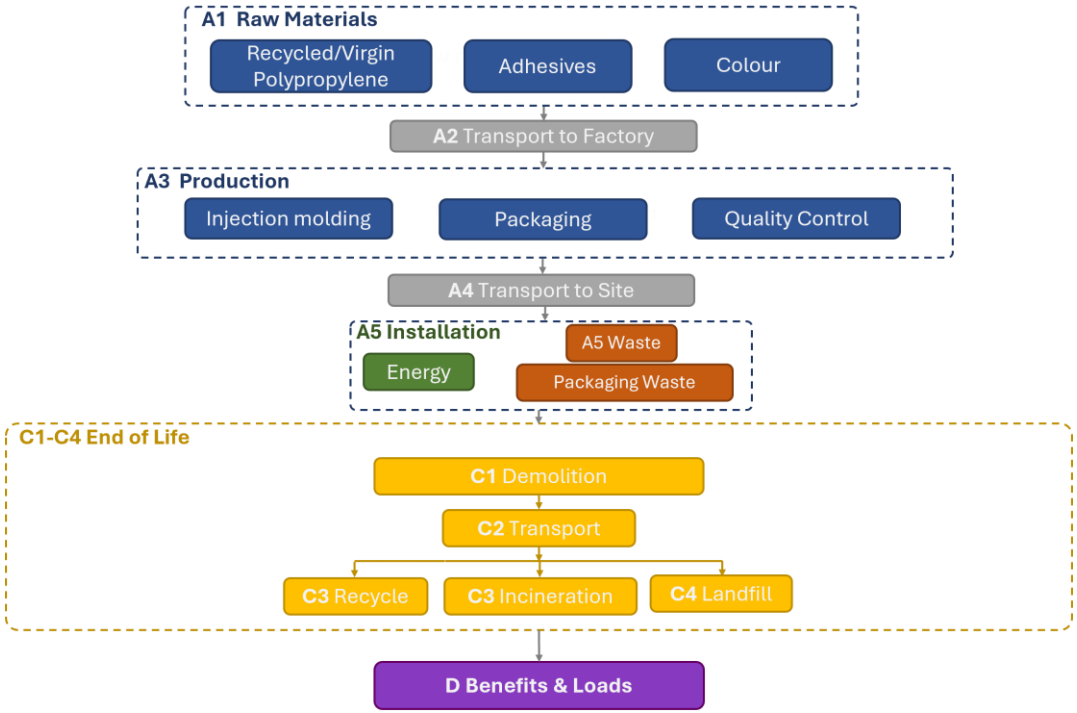
PRODUCT USE AND MAINTENANCE (B1-B7)

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 for disassembling the end-of-life product is negligible, the environmental impacts of demolition are assumed to be zero (C1). During demolition, it is assumed that an excavator is used solely to remove the soil cover on top of and around the blocks, while collection and loading of the elements are carried out manually. The end-of-life product is assumed to be transported by lorry to the nearest waste treatment facility, located approximately 50 km away (C2). It is assumed that 100% of the end-of-life product is collected separately from the demolition site, with 23% sent to recycling and 50% to incineration facilities (C3). Only 27% of the end-of-life products are disposed of in landfill (C4). Due to the recycling and incineration potential of polypropylene, the end-of-life product is converted into recycled PP, while energy and heat are recovered through incineration (D). The benefits and environmental loads associated with the disposal of packaging materials from stage A5 are also included in Module 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. 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.

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.

There is a 5% production loss reused for the production of blocks; There are three Stickers per pallet - which are not listed in the data part; Color for Elements is been cut off as we weren't able to receive the material mixture from the manufacturer but the mass consumption is less than 1%; The same is valid for the block connectors although the color is 2%. There is no Air Pressure measurable for a single block connector, so it isn't mentioned in the data part.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

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 material	No allocation
Ancillary materials	No allocation
Manufacturing energy and waste	No allocation

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple products
Grouping method	Based on a representative product
Variation in GWP-fossil for A1-A3, %	+14%

This EPD cover Rigofill ST-A and Rigofill ST-S at Schwarzheide (SWH) site. The variation between this representative product and Rigofill ST-S is +12% in the GWP A1-A3 fossil.

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 v3.10.1 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1 environmental data sources follow the methodology ‘allocation, Cut-off, EN 15804+A2‘.

ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

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	2,48E+00	4,77E-01	1,50E-01	3,11E+00	7,07E-01	1,34E+00	MND	MND	MND	MND	MND	MND	MND	1,28E+00	1,36E-01	9,76E+00	2,34E-01	-6,64E+00
GWP – fossil	kg CO_2e	2,22E+00	4,76E-01	1,43E+00	4,13E+00	7,06E-01	5,63E-02	MND	MND	MND	MND	MND	MND	MND	1,28E+00	1,36E-01	9,76E+00	2,34E-01	-6,76E+00
GWP – biogenic	kg CO_2e	2,55E-01	1,06E-04	-1,28E+00	-1,03E+00	1,60E-04	1,28E+00	MND	MND	MND	MND	MND	MND	MND	1,31E-04	3,02E-05	-2,08E-04	-1,23E-04	1,21E-01
GWP – LULUC	kg CO_2e	4,73E-03	2,13E-04	3,61E-03	8,55E-03	3,16E-04	1,03E-04	MND	MND	MND	MND	MND	MND	MND	1,31E-04	5,88E-05	2,32E-04	1,48E-05	-6,32E-03
Ozone depletion pot.	kg $CFC\text{-}_{11}e$	2,52E-08	7,03E-09	4,55E-08	7,77E-08	1,04E-08	6,34E-10	MND	MND	MND	MND	MND	MND	MND	1,96E-08	2,13E-09	2,48E-09	5,91E-10	-2,17E-07
Acidification potential	mol H^+e	1,18E-02	1,62E-03	4,73E-03	1,82E-02	2,41E-03	1,56E-04	MND	MND	MND	MND	MND	MND	MND	1,16E-02	4,58E-04	1,85E-03	1,62E-04	-3,09E-02
EP-freshwater[2)]	kg Pe	1,20E-03	3,71E-05	1,88E-03	3,12E-03	5,50E-05	5,82E-05	MND	MND	MND	MND	MND	MND	MND	3,69E-05	1,03E-05	4,97E-05	2,37E-06	-2,70E-03
EP-marine	kg Ne	2,56E-03	5,34E-04	4,44E-03	7,54E-03	7,91E-04	1,08E-04	MND	MND	MND	MND	MND	MND	MND	5,36E-03	1,51E-04	9,38E-04	5,19E-04	-4,81E-03
EP-terrestrial	mol Ne	2,23E-02	5,81E-03	1,12E-02	3,93E-02	8,61E-03	4,92E-04	MND	MND	MND	MND	MND	MND	MND	5,87E-02	1,64E-03	8,37E-03	6,60E-04	-4,88E-02
POCP ("smog")[3)]	kg NMVOCe	6,81E-03	2,39E-03	3,88E-03	1,31E-02	3,55E-03	1,60E-04	MND	MND	MND	MND	MND	MND	MND	1,75E-02	6,81E-04	2,20E-03	2,85E-04	-2,93E-02
ADP-minerals & metals[4)]	kg Sbe	1,90E-05	1,33E-06	1,26E-05	3,29E-05	1,97E-06	1,14E-07	MND	MND	MND	MND	MND	MND	MND	4,59E-07	3,90E-07	1,32E-06	5,06E-08	-3,57E-05
ADP-fossil resources	MJ	3,25E+01	6,91E+00	2,31E+01	6,25E+01	1,02E+01	8,21E-01	MND	MND	MND	MND	MND	MND	MND	1,67E+01	1,96E+00	2,20E+00	5,07E-01	-1,76E+02
Water use[5)]	m^3e depr.	7,84E-01	3,42E-02	4,29E-01	1,25E+00	5,06E-02	1,35E-02	MND	MND	MND	MND	MND	MND	MND	4,18E-02	9,69E-03	2,84E-01	2,44E-03	-1,89E+00

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, EF 3.1

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	1,91E-07	4,77E-08	4,47E-08	2,84E-07	7,07E-08	1,71E-09	MND	MND	MND	MND	MND	MND	MND	3,28E-07	1,31E-08	3,40E-08	3,66E-09	-1,97E-07
Ionizing radiation[6)]	kBq U235e	5,21E-01	6,02E-03	3,38E-01	8,65E-01	8,93E-03	1,02E-02	MND	MND	MND	MND	MND	MND	MND	7,42E-03	1,84E-03	9,31E-03	4,96E-04	-1,40E+00
Ecotoxicity (freshwater)	CTUe	1,17E+01	9,78E-01	1,32E+01	2,59E+01	1,45E+00	1,84E-01	MND	MND	MND	MND	MND	MND	MND	9,22E-01	2,75E-01	2,85E+00	7,24E-01	-1,26E+01
Human toxicity, cancer	CTUh	1,27E-09	7,87E-11	1,42E-09	2,76E-09	1,17E-10	1,30E-11	MND	MND	MND	MND	MND	MND	MND	1,32E-10	2,26E-11	4,14E-10	1,16E-11	-1,09E-09
Human tox. non-cancer	CTUh	3,21E-08	4,48E-09	3,17E-08	6,82E-08	6,64E-09	6,56E-10	MND	MND	MND	MND	MND	MND	MND	2,08E-09	1,27E-09	1,59E-08	2,25E-09	-5,44E-08
SQP[7)]	-	1,26E+01	6,96E+00	1,12E+02	1,31E+02	1,03E+01	2,82E-01	MND	MND	MND	MND	MND	MND	MND	1,17E+00	1,85E+00	2,17E+00	1,18E+00	-2,90E+01

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	6,55E+00	9,48E-02	1,37E+01	2,04E+01	1,40E-01	-5,61E+00	MND	MND	MND	MND	MND	MND	MND	1,06E-01	2,81E-02	1,49E-01	7,81E-03	-1,33E+01
Renew. PER as material	MJ	0,00E+00	0,00E+00	1,09E+01	1,09E+01	0,00E+00	-1,09E+01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,71E-01
Total use of renew. PER	MJ	6,55E+00	9,48E-02	2,47E+01	3,13E+01	1,40E-01	-1,65E+01	MND	MND	MND	MND	MND	MND	MND	1,06E-01	2,81E-02	1,49E-01	7,81E-03	-1,30E+01
Non-re. PER as energy	MJ	-2,74E+02	6,92E+00	2,24E+01	-2,44E+02	1,02E+01	7,17E-01	MND	MND	MND	MND	MND	MND	MND	1,67E+01	1,96E+00	-2,08E+02	-7,59E+01	-1,92E+02
Non-re. PER as material	MJ	3,06E+02	0,00E+00	6,71E-01	3,07E+02	0,00E+00	-6,71E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-2,24E+02	-8,27E+01	7,06E+01
Total use of non-re. PER	MJ	3,25E+01	6,92E+00	2,31E+01	6,25E+01	1,02E+01	4,56E-02	MND	MND	MND	MND	MND	MND	MND	1,67E+01	1,96E+00	-4,32E+02	-1,59E+02	-1,21E+02
Secondary materials	kg	7,65E+00	2,94E-03	4,35E-02	7,70E+00	4,36E-03	2,22E-04	MND	MND	MND	MND	MND	MND	MND	6,95E-03	8,46E-04	7,27E-03	1,81E-04	1,74E+00
Renew. secondary fuels	MJ	2,17E-04	3,74E-05	3,12E-01	3,12E-01	5,54E-05	1,91E-06	MND	MND	MND	MND	MND	MND	MND	1,82E-05	1,07E-05	5,29E-05	3,41E-06	-1,73E-04
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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	2,20E-02	1,02E-03	1,24E-02	3,54E-02	1,52E-03	-2,24E-04	MND	MND	MND	MND	MND	MND	MND	1,11E-03	2,86E-04	1,36E-03	-7,19E-03	-6,50E-02

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	1,76E-01	1,17E-02	7,72E-02	2,65E-01	1,74E-02	2,78E-03	MND	MND	MND	MND	MND	MND	MND	1,86E-02	3,25E-03	9,62E-02	8,77E-04	-3,43E-01
Non-hazardous waste	kg	8,63E+00	2,17E-01	1,88E+02	1,97E+02	3,21E-01	1,15E+00	MND	MND	MND	MND	MND	MND	MND	2,54E-01	6,12E-02	5,74E+00	9,69E+00	-4,17E+01
Radioactive waste	kg	1,34E-04	1,47E-06	9,72E-05	2,32E-04	2,19E-06	3,01E-06	MND	MND	MND	MND	MND	MND	MND	1,82E-06	4,52E-07	2,36E-06	1,21E-07	-3,59E-04

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	0,00E+00	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	1,21E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	3,85E+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	0,00E+00	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	6,36E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,67E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,69E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	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	2,47E+00	4,74E-01	1,44E+00	4,39E+00	7,02E-01	6,50E-02	MND	MND	MND	MND	MND	MND	MND	1,27E+00	1,35E-01	9,76E+00	2,24E-01	-6,61E+00
Ozone depletion Pot.	kg $CFC_{-11}e$	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Acidification	kg SO_2e	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Eutrophication	kg PO_4^3e	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
POCP (“smog”)	kg C_2H_4e	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADP-elements	kg Sbe	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADP-fossil	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	2,22E+00	4,77E-01	1,43E+00	4,14E+00	7,07E-01	5,64E-02	MND	MND	MND	MND	MND	MND	MND	1,28E+00	1,36E-01	9,76E+00	2,34E-01	-6,76E+00

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero.

THIRD-PARTY 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.

Imane Uald Lamkaddam as an authorized verifier for EPD Hub Limited
24.07.2025