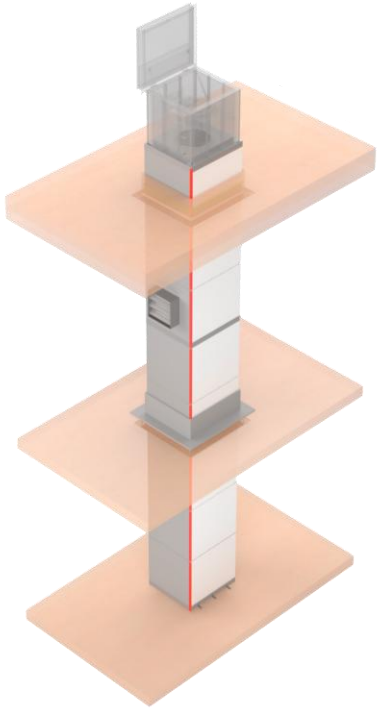
ENVIRONMENTAL PRODUCT DECLARATION

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

Orishaft - Smoke Extraction Shaft
KeraGroup Oy



EPD HUB, HUB-3073
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GENERAL INFORMATION

MANUFACTURER

Manufacturer	KeraGroup Oy
Address	Käkeläntie 41, 16300, Orimattila, FI
Contact details	info@keragroup.fi
Website	https://www.keragroup.fi/fi/keragroup/

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
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Tommi Tuominen
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Silvia Vilčeková, 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	Orishaft - Smoke Extraction Shaft
Additional labels	-
Product reference	-
Place of production	Hevostie 6 Oriville factory, Finland
Period for data	2023
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	-0,7%/+1,6% %

ENVIRONMENTAL DATA SUMMARY

Declared unit	kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	3,42E+00
GWP-total, A1-A3 ($kgCO_2e$)	3,32E+00
Secondary material, inputs (%)	51.1
Secondary material, outputs (%)	0
Total energy use, A1-A3 (kWh)	13
Net freshwater use, A1-A3 (m^3)	0.34

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Kera Group Oy is a company based in Orimattila that manufactures plastic products for the construction industry. The company's expertise is focused on various daylight solutions and fire safety-enhancing smoke ventilation systems. The main products include smoke vents, roof domes, and various home and living solutions such as light-transmitting roofing sheets, terraces, and terrace glazing.

PRODUCT DESCRIPTION

Orishaft – Smoke Control Duct, Commonly Known as a Smoke Extraction Shaft
Orishaft is a factory-manufactured, CE-marked, and EI60-rated fire safety product. In the event of a fire, Orishaft protects lives and buildings from both smoke and heat due to its excellent fire insulation capability.
Smoke control systems are designed to remove smoke and heat from a building during a fire. If hot smoke gases need to be routed through different fire compartments, smoke extraction must be carried out using a fire-resistant duct. To meet this need, the manufacturer has developed a modular, easy-to-install, and highly airtight smoke control duct. The Orishaft smoke control duct is installed vertically and can pass through multiple fire compartments on its way out of the building.

PRODUCT DESCRIPTION

- Rated EI60S, CE-marked.
- Applicable/mandatory standards can be found in the product datasheet.
- Approved only for vertical installation.
- Average thermal insulation (U-value) of the structure: 0.44 W/m²K.
- Easy and quick installation (compared to block structures).
- Modular design.
- Excellent airtightness (compared to block structures).
- Suitable as both a fire-insulated ventilation duct (EN 1366-1) and a smoke control duct (EN 1366-8) for vertical installation.
- Can be used for smoke extraction either with high-temperature fans (EN 12101-3) or smoke vents (EN 12101-2).
- Can be used for smoke extraction or pressurization.

Typical applications include commercial buildings, shopping centers, hospitals, residential apartment buildings, etc.
Can be installed:
Through a single fire compartment, e.g., attic penetration.
Through multiple fire compartments, e.g., multi-story public spaces (hospitals, shopping centers, etc.).

PRODUCT COMPONENTS:

Orishaft Bottom
The lowest section of the duct. It starts from, for example, a slab with an opening matching the shaft's inner dimensions. Sealed with fire-resistant compound at the shaft edges or embedded in the slab with an additional surface casting around the shaft, leveled to the floor surface.
Orishaft Middle
The middle sections of the duct, also known as extension sections, if both the Bottom and Top sections are used at the lower and upper ends of the shaft. The Top section is not always necessary if, for example, an Orivent T1 smoke vent with a tongue-and-groove connection is installed at the shaft's top. Orishaft can also serve as the uppermost section of the shaft.
Orishaft Top
The uppermost section of the duct. Almost any type of smoke vent can be installed on top of it.
Orishaft Single
A single duct section primarily designed for installation through roof structures.

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

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	51,86	EU, China
Minerals	46,47	EU
Fossil materials	1,57	EU, China
Bio-based materials	0,1	EU

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-0,005784955
Biogenic carbon content in packaging, kg C	-0,028393636

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	kg
Mass per declared unit	1 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	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.

The body is sandwich panel. It is a composite building material consisting of three layers. Outer face sheets are hot-dip galvanized, pre-finished thin sheet metal, color shade white RR20 and core is made of mineral wool, thickness 100 mm.The components are manufactured in several countries in Europe and transported to the manufacturing facility in Orimattila Finland.

The manufacturing process includes cutting, robot cutting, bending, painting, assembly and finally packaging. These process reguires electricity and heating.

A wooden pallet, plastic packing material and metal strap are used as packaging materials for transporting the finished product from the factory.

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.

Distance of the representative product transportation from production plant to building site is 23 km and the transportation method is assumed to be a lorry. To be conservative, empty returns are included in this study as implemented through an average load factor in the Ecoinvent transport datapoints. Transportation does not cause losses as product is packed properly. Environmental impacts from installation into the building include waste packaging materials (A5) and release of biogenic carbon dioxide from wood pallets/cardboard boxes. The impact of material production, its processing and its disposal as installation waste are also included. Electricity and diesel consumption for installation of the system is included based on an assumed scenario for product installation.

PRODUCT USE AND MAINTENANCE (B1-B7)

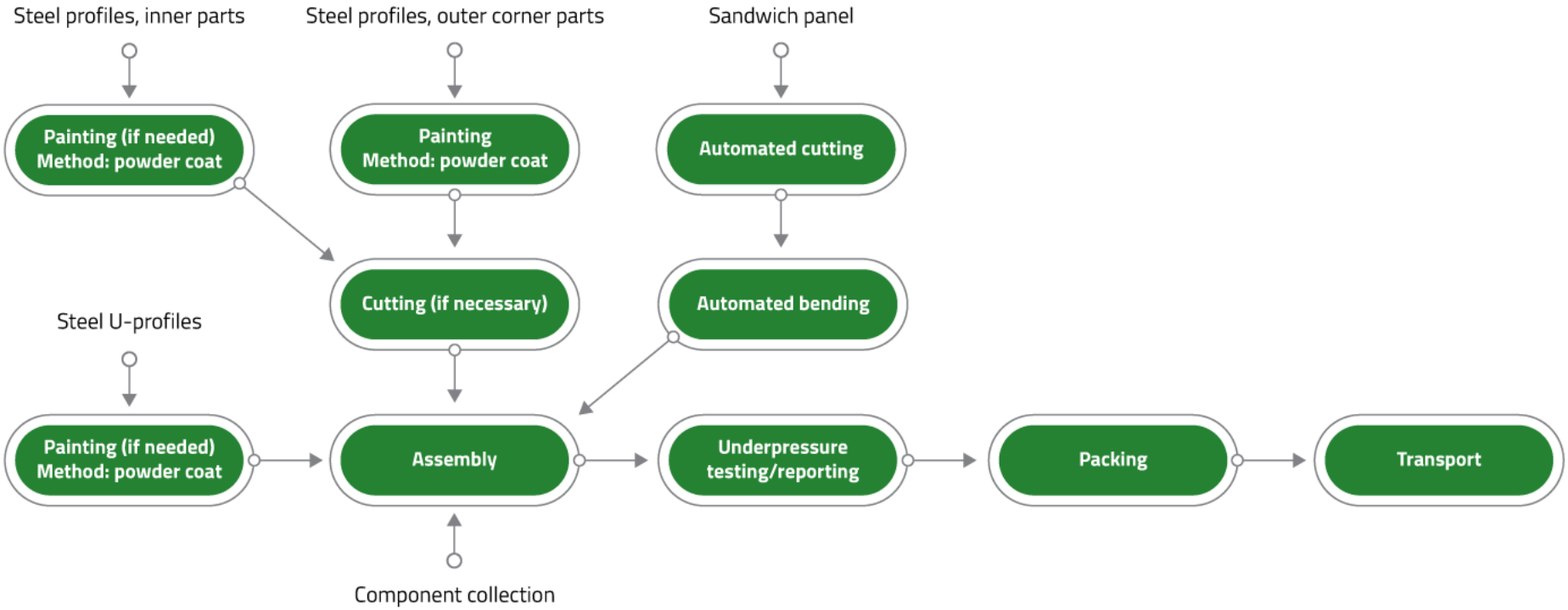
Routine maintenance includes checking functionality, and any emissions are negligible. Maintenance inspection is part of the general inspection of the building. Therefore, these modules have been left out of consideration. Sometimes parts may be replaced if they are broken, but it depends on the application and the technology installed in the product.

Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Consumption of energy in de-construction process is considered. It is assumed that the waste is collected separately and transported to the waste treatment center. Transportation distance to treatment is assumed as 25 km and the transportation method is assumed to be lorry (C2). Module C3 accounts for energy and resource inputs for sorting and treating these waste streams and incineration with energy recovery. Additionally, waste that is landfilled is included in Module C4.
This is a conservative model for Finland, as according to statistics.

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	No allocation
Packaging material	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by revenue

AVERAGES AND VARIABILITY

Type of average	Multiple products
Averaging method	Representative product
Variation in GWP-fossil for A1-A3	-0,7%/+1,6% %

Variation GWP -fossil with max and min compared to representative is -0,7%/+1,6%.
Orishaft is made in various sizes. The sizes presented here are min. 600x600x350, max. 1000x1250x1100, and representative 900x1200x1100. The calculations have been made based on the representative size. It consists of two parts each: Top, middle, and bottom.
The process and raw materials are the same regarding the materials, with slight variations possible depending on the product size.
The product weights are 227 kg (min.), 882 kg (max.), and 834 kg (representative). The finished products are packed on a pallet.

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.

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	2,78E+00	1,78E-01	3,65E-01	3,32E+00	2,15E-03	1,37E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,65E-02	0,00E+00	1,36E-02	-9,44E-01
GWP – fossil	kg CO_2e	2,78E+00	1,78E-01	4,69E-01	3,42E+00	2,15E-03	3,27E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,65E-02	0,00E+00	1,36E-02	-9,10E-01
GWP – biogenic	kg CO_2e	0,00E+00	0,00E+00	-1,04E-01	-1,04E-01	4,88E-07	1,04E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,30E-02
GWP – LULUC	kg CO_2e	1,45E-03	7,15E-05	5,19E-04	2,04E-03	9,63E-07	1,78E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,30E-06	0,00E+00	1,45E-05	-1,24E-04
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	9,01E-08	3,27E-09	1,28E-08	1,06E-07	3,18E-11	2,35E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,32E-10	0,00E+00	2,35E-10	-3,23E-09
Acidification potential	mol H^+e	1,60E-02	8,60E-04	9,04E-04	1,78E-02	7,34E-06	9,45E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,50E-05	0,00E+00	1,45E-04	-3,62E-03
EP-freshwater[2)]	kg Pe	8,38E-04	1,21E-05	5,16E-05	9,02E-04	1,68E-07	5,11E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,28E-06	0,00E+00	6,83E-06	-3,91E-04
EP-marine	kg Ne	2,62E-03	2,63E-04	2,39E-04	3,12E-03	2,41E-06	3,35E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,79E-05	0,00E+00	3,60E-05	-7,99E-04
EP-terrestrial	mol Ne	3,19E-02	2,88E-03	2,31E-03	3,71E-02	2,62E-05	2,39E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,95E-04	0,00E+00	4,03E-04	-8,76E-03
POCP ("smog")[3)]	kg NMVOCe	1,20E-02	1,11E-03	1,28E-03	1,44E-02	1,08E-05	8,40E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,73E-05	0,00E+00	1,26E-04	-2,99E-03
ADP-minerals & metals[4)]	kg Sbe	2,56E-05	4,76E-07	1,23E-06	2,74E-05	6,01E-09	1,63E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,28E-08	0,00E+00	7,26E-07	-8,72E-06
ADP-fossil resources	MJ	3,50E+01	2,56E+00	7,45E+00	4,50E+01	3,12E-02	3,68E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,32E-01	0,00E+00	2,20E-01	-8,42E+00
Water use[5)]	m^3e depr.	1,56E+00	1,26E-02	8,51E-02	1,66E+00	1,54E-04	4,38E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,09E-03	0,00E+00	2,69E-03	-1,54E-01

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	5,19E-08	1,70E-08	1,10E-08	7,98E-08	2,16E-10	2,26E-09	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,36E-09	0,00E+00	2,19E-09	-5,99E-08
Ionizing radiation[6)]	kBq U235e	5,50E-03	2,75E-03	1,82E-02	2,65E-02	2,72E-05	2,05E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,90E-04	0,00E+00	1,21E-03	2,99E-02
Ecotoxicity (freshwater)	CTUe	1,32E+00	3,13E-01	8,33E-01	2,47E+00	4,42E-03	8,41E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,61E-02	0,00E+00	8,65E-02	-2,22E+00
Human toxicity, cancer	CTUh	4,77E-09	2,98E-11	3,62E-11	4,84E-09	3,55E-13	1,58E-11	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,79E-12	0,00E+00	9,71E-12	-1,46E-10
Human tox. non-cancer	CTUh	2,86E-09	1,61E-09	1,90E-09	6,36E-09	2,02E-11	2,63E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,46E-10	0,00E+00	6,32E-10	-7,18E-09
SQP[7)]	-	7,01E-01	2,44E+00	9,54E+00	1,27E+01	3,15E-02	1,28E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,53E-01	0,00E+00	4,30E-01	-2,66E+00

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	2,29E+00	3,87E-02	3,84E+00	6,18E+00	4,28E-04	-1,03E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,18E-03	0,00E+00	2,62E-02	-3,71E-01
Renew. PER as material	MJ	5,60E-03	0,00E+00	9,12E-01	9,17E-01	0,00E+00	-9,12E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	-5,60E-03	2,90E-01
Total use of renew. PER	MJ	2,30E+00	3,87E-02	4,76E+00	7,09E+00	4,28E-04	-1,95E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,18E-03	0,00E+00	2,06E-02	-8,12E-02
Non-re. PER as energy	MJ	3,35E+01	2,56E+00	4,65E+00	4,07E+01	3,12E-02	2,23E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,32E-01	0,00E+00	2,20E-01	-8,42E+00
Non-re. PER as material	MJ	2,20E-02	0,00E+00	2,09E-01	2,31E-01	0,00E+00	-2,09E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	-2,20E-02	7,80E-02
Total use of non-re. PER	MJ	3,36E+01	2,56E+00	4,86E+00	4,10E+01	3,12E-02	1,46E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,32E-01	0,00E+00	1,98E-01	-8,34E+00
Secondary materials	kg	5,11E-01	1,10E-03	2,38E-02	5,36E-01	1,33E-05	1,91E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,03E-04	0,00E+00	1,87E-04	4,96E-01
Renew. secondary fuels	MJ	9,37E-03	1,34E-05	3,27E-02	4,20E-02	1,69E-07	6,30E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,32E-06	0,00E+00	8,17E-06	-7,42E-05
Non-ren. secondary fuels	MJ	1,38E-04	0,00E+00	0,00E+00	1,38E-04	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	3,03E-01	3,67E-04	4,09E-02	3,44E-01	4,62E-06	6,36E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,13E-05	0,00E+00	1,59E-04	-2,13E-03

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	1,65E-01	3,85E-03	1,30E-02	1,82E-01	5,29E-05	1,88E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,03E-04	0,00E+00	9,84E-04	-2,97E-01
Non-hazardous waste	kg	3,29E+00	7,42E-02	1,62E+00	4,98E+00	9,79E-04	2,63E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,54E-03	0,00E+00	3,43E-02	-2,37E+00
Radioactive waste	kg	5,38E-05	6,86E-07	4,01E-06	5,85E-05	6,77E-09	5,03E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,73E-08	0,00E+00	3,10E-07	7,73E-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	1,20E-01	0,00E+00	0,00E+00	1,20E-01	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	6,85E-04	0,00E+00	0,00E+00	6,85E-04	0,00E+00	2,57E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	4,50E-01	0,00E+00
Materials for energy rec	kg	2,91E-03	0,00E+00	0,00E+00	2,91E-03	0,00E+00	4,99E-10	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	2,55E-02	0,00E+00	0,00E+00	2,55E-02	0,00E+00	1,35E-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	2,54E+00	1,77E-01	4,67E-01	3,18E+00	2,14E-03	3,45E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,64E-02	0,00E+00	1,35E-02	-9,05E-01
Ozone depletion Pot.	kg CFC_{-11}e	1,32E-08	2,60E-09	1,04E-08	2,62E-08	2,54E-11	1,94E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,85E-10	0,00E+00	1,91E-10	-3,50E-09
Acidification	kg SO_2e	8,98E-03	6,65E-04	7,26E-04	1,04E-02	5,61E-06	7,59E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,21E-05	0,00E+00	1,15E-04	-2,92E-03
Eutrophication	kg PO_4^3e	1,87E-02	1,32E-04	2,37E-03	2,12E-02	1,37E-06	1,48E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,03E-05	0,00E+00	1,98E-05	-5,37E-04
POCP (“smog”)	kg C_2H_4e	9,00E-04	5,10E-05	1,17E-04	1,07E-03	5,00E-07	1,00E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,77E-06	0,00E+00	7,45E-06	-4,55E-04
ADP-elements	kg Sbe	2,22E-05	4,64E-07	1,20E-06	2,38E-05	5,86E-09	1,61E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,15E-08	0,00E+00	7,24E-07	-8,71E-06
ADP-fossil	MJ	8,90E+03	2,51E+00	2,99E+02	9,20E+03	3,08E-02	8,87E+01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,29E-01	0,00E+00	1,99E-01	-8,98E+00

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

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	2,78E+00	1,78E-01	4,70E-01	3,43E+00	2,15E-03	3,27E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,65E-02	0,00E+00	1,36E-02	-9,11E-01

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH4 fossil, CH4 biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO2 is set to zero.

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.

Silvia Vilčeková, as an authorized verifier acting for EPD Hub Limited.
21.03.2025

VERIFIED ISO 14025