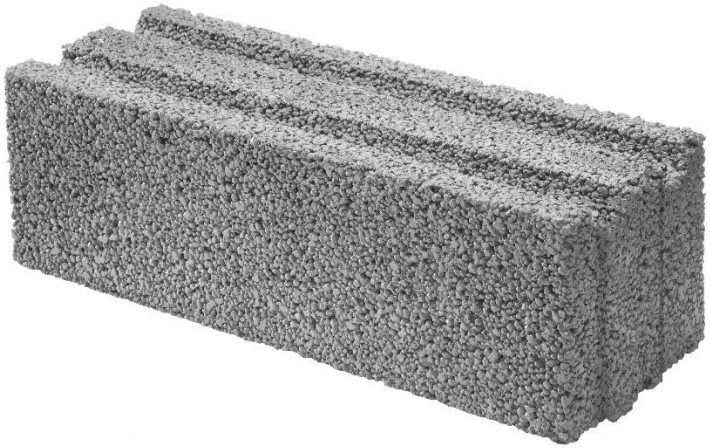
ENVIRONMENTAL PRODUCT DECLARATION

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



RUH-200P
Lakka Rakennustuotteet Oy

EPD HUB, HUB-1366
Published on 03.05.2024, last updated on 03.05.2029.

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Lakka Rakennustuotteet Oy
Address	Muuntamontie 2, 80100 Joensuu, Finland
Contact details	jussi.kakkonen@lakka.fi
Website	https://lakka.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 EN 16757 Product Category Rules for concrete and concrete elements
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 Anttonen, Laura Sariola, Afry Finland Oy
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ 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	RUH-200P
Place of production	Finland
Period for data	1.1.2022-31.12.2022
Averaging in EPD	Multiple factories
Variation in GWP-fossil for A1-A3	<10 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	2,35E-01
GWP-total, A1-A3 (kgCO2e)	2,11E-01
Secondary material, inputs (%)	1.55
Secondary material, outputs (%)	69
Total energy use, A1-A3 (kWh)	0.536
Total water use, A1-A3 (m3e)	9,32E-04

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Lakka Group is a family-owned concrete construction company founded in 1965. The subsidiaries of Lakka Group are Lakka Building Products Ltd and Lakka Element and Precast Concrete Ltd. The company has production facilities in Joensuu, Loppi, Jalasjärvi and Varkaus. The product groups manufactured by Lakka Group include paving stones, dry mixes, blocks, ready-mixed concrete, concrete elements, and stone houses. The operations have a Key Flag mark. The company values are based on the idea of responsibility towards the environment, personnel and customers.

PRODUCT DESCRIPTION

The reference product is an uninsulated, tongue and groove-type of a concrete block RUH-200P which is manufactured in factories located in Jalasjärvi, Joensuu and Loppi. Blocks are made of earth-moist light gravel concrete mass (density 700-1000 kg/m^3). Blocks are commonly used for foundations, load-bearing partitions and other load-bearing structures. The reference product has the following technical specifications:

Size: 200 x 598 x 195 mm
Weight kg/pcs: 16
Compressive strength of precast concrete: 2,7 MN/m²
Fire resistance: EI240/REI240

Uninsulated concrete blocks are available in various sizes and trade names. All components scale linearly so the values A1-A3 can be converted using the unit weights in the Annex 1.

Further information can be found at https://lakka.fi/

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0	-
Minerals	100	EU
Fossil materials	0	-
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	0.01

DECLARED UNIT

Declared unit	1 kg
Mass per declared unit	1 kg

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 product is made of earth-moist light gravel concrete mass which consists of sand and gravel, expanded clay aggregates, cement, blast furnace slag and water. The raw materials (A1) are manufactured in the EU and transported (A2) by truck (>32 t) or by sea (ferry). For raw material transports an occupancy rate of 100% is assumed for sea freight and 50% for road haulage.

In the manufacturing process (A3), the aggregate is delivered to the silos and dispensed on a conveyor to be weighed with a balance. Cement and slag are added and the material is mixed dry, after which water is added. The mass is mixed, filled into block molds and vibrated into the shape and density. The blocks are then taken to the dryer where the product acquires its final shape and density. Blocks are packed in plastic on wooden pallets and stored outside. Manufacturing requires energy for electricity and heating of production facilities. Molds, machinery and equipment are counted as capital goods and are not taken into consideration in the calculation. Waste generated at the production facility is sorted. The average distance to treatment is estimated at 20 km.

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.

Product is transported to the construction site with truck (>32 t). The average distance from the production facility to the construction is 137 km (A4). Possibly empty return trips are taken into consideration by using a 50% occupancy rate for road transports. Transportation losses are assessed as insignificant.

At the site, the concrete blocks are masonried manually with fine joint mortar, and the structure is reinforced with reinforcing steel. Transportation distance of installation materials varies site by site so the assumption of 100 km with 16-32 t truck has been used. The amount of wastage for the main installation materials has been estimated at 10%. As the location of construction sites varies, the transportation distance to treatment for installation waste (wastage and material packages) is estimated at 20 km as for the production 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.

Carbonatization during 100 years of use has been estimated according to EN16757 Annex G to be -6 kg CO2e/m2 (both sides) but has not been considered in the calculation.

PRODUCT END OF LIFE (C1-C4, D)

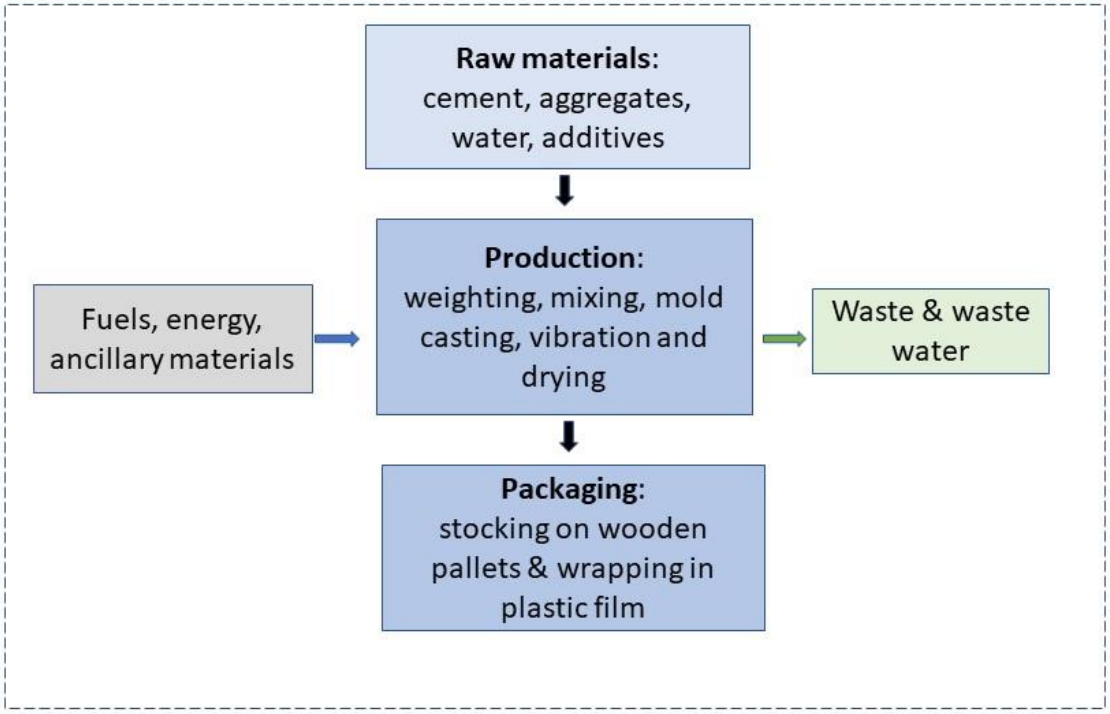
At the end of the life cycle, the concrete structure is dismantled (C1). Materials added at installation are included in module C. The energy consumption (0.107 MJ / kg) for the demolition phase has been based on VTT's estimate of the demolition energy of a concrete building. The estimate is declared in the background report on the environmental impact of building materials (Rakennusmateriaalien ympäristövaikutukset –Taustaraportti, VTT, 2013). The dismantled waste material is transported to the closest facility for recycling or final disposal (C2). The assumption for an average transport is estimated to be 20 km by 16-32 t truck.

According to the assumption, 80% of the concrete waste is crushed and recycled to replace virgin gravel in soil construction (C3). 20% of the concrete waste is assumed to be disposed of to landfill (C4). The waste handling scenario is a conservative assumption based on Finland's current practice and the concrete recycling rate assessment by the Finnish Environment Institute (Sederholm, 2019). Steel is assumed to be separable from demolished concrete and sorted for recycling. As the End-of-Life conditions of concrete cannot be preciously defined and the knowledge of the rate of CO2 uptake in the different underground conditions and real particle size distributions is limited, carbonatization is estimated based on the simplified method described in EN16757.

The benefits of replacing virgin aggregates with crushed concrete and the energy recovery of packages is considered in module D.

MANUFACTURING PROCESS

System boundary in A1-A3 modules



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	Multiple factories
Averaging method	Averaged by shares of total volume
Variation in GWP-fossil for A1-A3	<10 %

The data used in the EPD is the weighted average of the production data of three different factories (Joensuu, Loppi, Jalasjärvi). On a factory level, the allocation to the product is done based on the production volume. The factory-specific differences in the GWP (min. /max.) are < 10%.

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 v3.8 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	1,98E-01	2,67E-02	-1,37E-02	2,11E-01	2,38E-02	9,96E-02	MND	MND	MND	MND	MND	MND	MND	1,83E-02	7,67E-03	4,08E-05	2,22E-04	-5,63E-03
GWP – fossil	kg CO_2e	1,98E-01	2,67E-02	1,04E-02	2,35E-01	2,38E-02	7,50E-02	MND	MND	MND	MND	MND	MND	MND	1,83E-02	7,66E-03	3,96E-05	2,21E-04	-5,61E-03
GWP – biogenic	kg CO_2e	0,00E+00	0,00E+00	-2,44E-02	-2,44E-02	0,00E+00	2,44E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP – LULUC	kg CO_2e	8,44E-05	1,36E-05	2,98E-04	3,96E-04	8,94E-06	1,37E-04	MND	MND	MND	MND	MND	MND	MND	1,82E-06	3,06E-06	1,20E-06	1,15E-06	-2,16E-05
Ozone depletion pot.	kg CFC_{-11}e	6,95E-09	6,02E-09	1,41E-09	1,44E-08	5,94E-09	4,61E-09	MND	MND	MND	MND	MND	MND	MND	3,90E-09	1,78E-09	1,25E-09	4,94E-10	-4,69E-10
Acidification potential	mol H^+e	1,08E-03	4,56E-04	4,44E-05	1,58E-03	7,59E-05	2,97E-04	MND	MND	MND	MND	MND	MND	MND	1,90E-04	2,18E-05	6,14E-05	1,15E-05	-3,45E-05
EP-freshwater[2)]	kg Pe	2,14E-06	1,43E-07	2,22E-06	4,50E-06	1,70E-07	1,90E-06	MND	MND	MND	MND	MND	MND	MND	6,05E-08	5,47E-08	4,75E-08	1,28E-08	-1,79E-07
EP-marine	kg Ne	3,55E-04	1,13E-04	1,28E-05	4,80E-04	1,68E-05	7,35E-05	MND	MND	MND	MND	MND	MND	MND	8,39E-05	4,34E-06	2,67E-05	3,97E-06	-9,24E-06
EP-terrestrial	mol Ne	4,02E-03	1,25E-03	1,23E-04	5,39E-03	1,86E-04	8,14E-04	MND	MND	MND	MND	MND	MND	MND	9,21E-04	4,83E-05	2,93E-04	4,37E-05	-1,07E-04
POCP ("smog")[3)]	kg NMVOCe	9,91E-04	3,37E-04	4,57E-05	1,37E-03	7,32E-05	2,60E-04	MND	MND	MND	MND	MND	MND	MND	2,53E-04	1,85E-05	8,06E-05	1,27E-05	-2,96E-05
ADP-minerals & metals[4)]	kg Sbe	1,97E-07	5,12E-08	5,52E-08	3,03E-07	5,84E-08	4,87E-07	MND	MND	MND	MND	MND	MND	MND	9,25E-09	2,77E-08	3,67E-09	2,80E-09	-3,88E-08
ADP-fossil resources	MJ	3,29E-01	3,83E-01	4,65E-01	1,18E+00	3,81E-01	6,31E-01	MND	MND	MND	MND	MND	MND	MND	2,46E-01	1,14E-01	8,33E-02	3,35E-02	-1,02E-01
Water use[5)]	m^3e depr.	2,02E+01	1,48E-03	8,54E-03	2,02E+01	1,76E-03	1,74E-02	MND	MND	MND	MND	MND	MND	MND	6,60E-04	5,34E-04	3,60E-04	1,06E-04	-1,84E-03

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	2,53E-08	2,00E-09	6,75E-10	2,79E-08	2,77E-09	4,65E-09	MND	MND	MND	MND	MND	MND	MND	5,08E-09	6,18E-10	8,57E-09	2,31E-10	-5,43E-10
Ionizing radiation[6)]	kBq U235e	2,34E-01	1,89E-03	1,95E-02	2,56E-01	1,96E-03	3,89E-03	MND	MND	MND	MND	MND	MND	MND	1,13E-03	5,99E-04	5,09E-04	1,51E-04	-3,09E-03
Ecotoxicity (freshwater)	CTUe	6,13E+00	2,86E-01	2,06E-01	6,62E+00	3,17E-01	1,73E+00	MND	MND	MND	MND	MND	MND	MND	1,48E-01	9,52E-02	5,01E-02	2,18E-02	-1,07E-01
Human toxicity, cancer	CTUh	1,40E-10	1,19E-11	3,13E-11	1,83E-10	8,23E-12	2,74E-10	MND	MND	MND	MND	MND	MND	MND	5,66E-12	2,93E-12	2,05E-12	5,46E-13	-3,76E-12
Human tox. non-cancer	CTUh	3,39E-09	2,53E-10	1,40E-10	3,78E-09	3,22E-10	1,12E-09	MND	MND	MND	MND	MND	MND	MND	1,07E-10	9,32E-11	3,90E-11	1,43E-11	-8,63E-11
SQP[7)]	-	4,51E+00	2,80E-01	1,99E+00	6,78E+00	4,44E-01	6,59E-01	MND	MND	MND	MND	MND	MND	MND	3,19E-02	8,10E-02	1,09E-02	7,16E-02	-8,09E-02

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-02	3,95E-03	1,51E-01	2,20E-01	4,93E-03	6,69E-02	MND	MND	MND	MND	MND	MND	MND	1,40E-03	1,66E-03	1,43E-03	2,91E-04	-1,71E-02
Renew. PER as material	MJ	0,00E+00	0,00E+00	2,14E-01	2,14E-01	0,00E+00	-2,14E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	6,55E-02	3,95E-03	3,65E-01	4,34E-01	4,93E-03	-1,47E-01	MND	MND	MND	MND	MND	MND	MND	1,40E-03	1,66E-03	1,43E-03	2,91E-04	-1,71E-02
Non-re. PER as energy	MJ	3,37E-01	3,83E-01	4,25E-01	1,15E+00	3,81E-01	6,31E-01	MND	MND	MND	MND	MND	MND	MND	2,46E-01	1,14E-01	8,33E-02	3,35E-02	-1,02E-01
Non-re. PER as material	MJ	0,00E+00	0,00E+00	3,96E-02	3,96E-02	0,00E+00	-3,96E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	3,37E-01	3,83E-01	4,64E-01	1,18E+00	3,81E-01	5,91E-01	MND	MND	MND	MND	MND	MND	MND	2,46E-01	1,14E-01	8,33E-02	3,35E-02	-1,02E-01
Secondary materials	kg	1,55E-02	1,29E-04	8,25E-04	1,64E-02	1,07E-04	3,27E-03	MND	MND	MND	MND	MND	MND	MND	9,61E-05	3,88E-05	3,35E-05	7,03E-06	-5,04E-05
Renew. secondary fuels	MJ	9,57E-02	7,55E-07	7,24E-03	1,03E-01	9,46E-07	1,25E-04	MND	MND	MND	MND	MND	MND	MND	3,14E-07	4,27E-07	1,03E-07	1,84E-07	-2,82E-07
Non-ren. secondary fuels	MJ	4,68E-01	0,00E+00	0,00E+00	4,68E-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
Use of net fresh water	m^3	6,83E-04	3,93E-05	2,11E-04	9,33E-04	5,05E-05	3,89E-04	MND	MND	MND	MND	MND	MND	MND	1,49E-05	1,45E-05	9,50E-06	3,66E-05	-1,37E-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	1,42E-04	4,41E-04	5,74E-04	1,16E-03	4,08E-04	1,22E-02	MND	MND	MND	MND	MND	MND	MND	3,29E-04	1,30E-04	1,26E-04	0,00E+00	-4,07E-04
Non-hazardous waste	kg	3,99E-03	5,85E-03	1,09E-02	2,07E-02	7,10E-03	2,57E-01	MND	MND	MND	MND	MND	MND	MND	2,31E-03	2,31E-03	2,02E-03	2,32E-01	-1,62E-01
Radioactive waste	kg	1,14E-06	2,68E-06	4,67E-06	8,48E-06	2,63E-06	2,43E-06	MND	MND	MND	MND	MND	MND	MND	1,73E-06	7,85E-07	5,87E-07	0,00E+00	-7,97E-07

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	2,10E-05	0,00E+00	4,50E-03	4,52E-03	0,00E+00	1,68E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	9,45E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	6,31E-05	0,00E+00	9,70E-04	1,03E-03	0,00E+00	2,10E-02	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	3,60E-04	0,00E+00	0,00E+00	3,60E-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

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	2,81E-01	2,65E-02	1,05E-02	3,18E-01	2,36E-02	7,45E-02	MND	MND	MND	MND	MND	MND	MND	1,80E-02	7,60E-03	-2,80E-05	1,96E-04	-5,48E-03
Ozone depletion Pot.	kg CFC_{-11}e	4,74E-09	4,76E-09	1,18E-09	1,07E-08	4,71E-09	3,88E-09	MND	MND	MND	MND	MND	MND	MND	3,09E-09	1,41E-09	9,88E-10	3,91E-10	-3,86E-10
Acidification	kg SO_2e	1,24E-03	3,65E-04	3,50E-05	1,64E-03	6,16E-05	2,34E-04	MND	MND	MND	MND	MND	MND	MND	1,35E-04	1,79E-05	4,39E-05	8,67E-06	-2,68E-05
Eutrophication	kg PO_4^3e	2,48E-04	4,47E-05	2,36E-05	3,16E-04	1,31E-05	9,46E-05	MND	MND	MND	MND	MND	MND	MND	3,14E-05	3,85E-06	1,09E-05	1,87E-06	-8,87E-06
POCP (“smog”)	kg C_2H_4e	6,07E-05	1,00E-05	4,01E-06	7,48E-05	2,87E-06	1,63E-05	MND	MND	MND	MND	MND	MND	MND	2,96E-06	9,02E-07	9,90E-07	3,64E-07	-1,59E-06
ADP-elements	kg Sbe	5,72E-07	4,98E-08	5,49E-08	6,77E-07	5,68E-08	4,22E-07	MND	MND	MND	MND	MND	MND	MND	9,11E-09	2,71E-08	3,62E-09	2,76E-09	-3,87E-08
ADP-fossil	MJ	1,55E+00	3,82E-01	4,65E-01	2,39E+00	3,81E-01	6,30E-01	MND	MND	MND	MND	MND	MND	MND	2,46E-01	1,14E-01	8,33E-02	3,35E-02	-9,90E-02

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	1,98E-01	2,67E-02	1,04E-02	2,35E-01	2,38E-02	7,50E-02	MND	MND	MND	MND	MND	MND	MND	1,83E-02	7,66E-03	3,96E-05	2,21E-04	-5,61E-03

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.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited
03.05.2024

VERIFIED ISO 14025

ANNEX 1: UNIT WEIGHTS FOR PRODUCT VARIANTS

Trade name	Weight (kg/pcs)
H-75	7,4
UH-100P	10
UH-125P	12,4
RUH-150P	11
RUH-200P	15,7
RUH-250P	20
RUH-300P	26
RUH-380P	28
VSH-88/600	12

All components scale linearly so the values A1-A3 can be converted using the unit weights.