



bauroc REINFORCED PRODUCTS

Environmental Product Declaration

EN 15804+A2 & ISO 14025 / ISO 21930



bauroc
SUSTAINABLE BUILDING SINCE 2001

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	Bauroc AS
Address	Andja, Rakvere vald, 44209 Lääne-Virumaa, Estonia
Contact details	toomas.nilson@bauroc.eu
Website	www.bauroc.ee

PRODUCT IDENTIFICATION

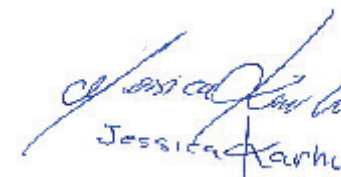
Product name	Reinforced autoclaved aerated concrete elements – WALL ELEMENTS, FLOOR ELEMENTS, VERTICAL WALL ELEMENTS, non-loadbearing LINTELS, loadbearing LINTELS
Additional label(s)	CE
Place(s) of production	Estonia, Andja

EPD INFORMATION

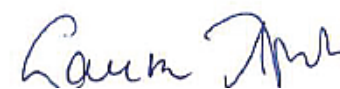
EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	The Building Information Foundation RTS sr Malminkatu 16 A, 00100 Helsinki, Finland http://cer.rts.fi
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards
Product category rules	CEN standard 15804+A2 serves as the core PCR, RTS PCR (English version, 26.8.2020)
EPD author	Anni Oviir, Anette lital Rangi Maja OÜ, www.lcasupport.com
EPD verification	Independent verification of this EPD and data, according to ISO 14025: Internal certification <input type="checkbox"/> External verification <input checked="" type="checkbox"/>
EPD verifier	Silvia Vilčeková, Silcert, s.r.o. silcertsro@gmail.com
EPD number	RTS_121_21
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EPD valid until	24.5.2026

Jessica Karhu
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Managing Director




PRODUCT INFORMATION

PRODUCT DESCRIPTION

Bauroc reinforced autoclaved aerated concrete (AAC) products are made purely from natural raw minerals, practically inexhaustible in nature - sand, cement, lime, gypsum and water – using an aerating agent, the aluminium. Reinforcing steel is used for reinforcement of lintels and panels, the characteristics of which conform to standard EN 10080.

Bauroc reinforced AAC products are produced with densities from 500 kg/m³ up to 575 kg/m³ and include:

- FLOOR ELEMENT – with structural reinforcement (welded fabric)
- WALL ELEMENT – horizontal, non-loadbearing with non-structural reinforcement (welded fabric)
- VERTICAL WALL ELEMENT – non-loadbearing with non-structural reinforcement (steel bars)
- Loadbearing LINTEL – with structural reinforcement (lattice grider)
- Non-loadbearing LINTEL – with non-structural reinforcement (lattice grider)

PRODUCT APPLICATION

Bauroc reinforced products are used for:

- FLOOR ELEMENT – in ceiling and roof constructions of buildings
- WALL ELEMENT – mountable internal and external non-loadbearing walls. Separating walls with fire resistance EI or EI-M
- VERTICAL WALL ELEMENT – mountable internal non-loadbearing walls

- Loadbearing LINTEL – used as a beam placed across the openings like doors, windows etc. in bauroc block walls to support the load from the structure above
- Non-loadbearing LINTEL – used as a beam placed across the openings like doors, windows etc. in bauroc partition walls

Having a porous structure, bauroc products provide a high level of thermal insulation. It is an ideal material that offers significant savings in the initial outlay and running costs of heating or cooling buildings as well as opportunity for exploiting other potential benefits.

All Bauroc products have excellent resistance to fire. Bauroc AAC is classified as non-combustible and have a reaction to fire of Class A1. A 150 mm thick bauroc block wall is fire resistant up to 4 hours in non-loadbearing situations and 2 hours in loadbearing situations. AAC inhibits heat transfer through a wall several times better than normal concrete.

PRODUCT STANDARDS

EN 12602:2008+A1:2013 Prefabricated reinforced components of autoclaved aerated concrete.

PHYSICAL PROPERTIES OF THE PRODUCT

Product properties can be found on the manufacturer website at <https://bauroc.eu/products/>

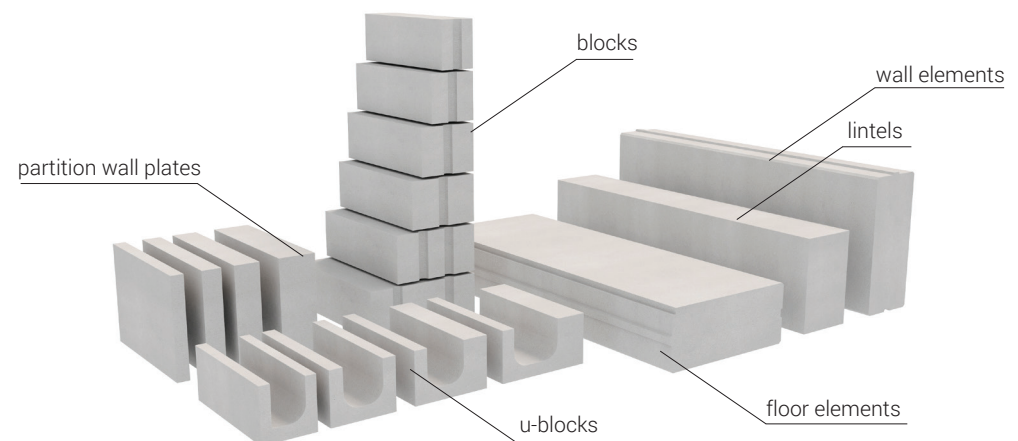
ADDITIONAL TECHNICAL INFORMATION

Further information can be found at <https://bauroc.ee/>

TECHNICAL SPECIFICATIONS

Product	Thicknesse (mm)	Density (kg/m ³)	Thermal conductivity $\lambda_{10,dry}$ (W/mK)	Steel (kg/m ³)
WALL ELEMENTS	150, 200, 250, 300, 375	500	0,12	37
FLOOR ELEMENTS	200, 250	500	0,12	37
Non-loadbearing LINTELS	100, 150	500	0,12	36
Loadbearing LINTELS	150, 200, 250, 300, 375, 400, 500	500	0,12	65/144*
VERTICAL WALL ELEMENTS	75, 100, 125, 150	575	0,14	11

*loadbearing lintels 200mm in height



PRODUCT RAW MATERIAL COMPOSITION

Materials	Amount (%)	Usability			Origin
		Renewable	Non-renewable	Recycled	
Cement, powder	9-22%		x		Estonia
Lime, powder	2-5%		x		Estonia
Fly Ash, powder	5-17%		x		Estonia
Sand	10-26%		x		Estonia
Gypsum stone	2-4%		x		EU
Additives	<0.05%		x		EU and non-EU
Water	5-7%		x		Estonia
Water, loss of moisture	25-35%		x		Estonia
Reinforcement, steel	1-8%			x	non-EU
Anti-corrosion mastic, liquid	<0.05%		x		non-EU

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	5	non-EU
Minerals	60	EU
Water	35	Estonia
Fossil materials	0	-
Bio-based materials	0	-

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

MANUFACTURING AND PACKAGING (A1-A3)

Key ingredient for manufacturing bauroc AAC products is silica rich sand. Sand is mixed with gypsum and water and grinds finally in the ball mill converting it into sand slurry. Sand slurry is pumped into a separate container/tank. Similarly, lime powder and cement are transported into individual containers using screw conveyors. Once the required amount of each ingredient is reached, control system releases all ingredients into mixing drum. A small amount of aluminium suspension is added separately. Once the mixture has settled, it is ready to be poured into moulds using the dosing unit.

Before casting, moulds are coated with a thin layer of oil. This is done in order to ensure that green-cake does not stick to moulds.

Steel frames are inserted before pouring in the mixture.

While slurry is mixed and poured into oiled moulds, aluminium reacts with Calcium Hydroxide and water to form Hydrogen. Millions of tiny Hydrogen bubbles are released due to this reaction. This leads to the formation of tiny unconnected cells causing the slurry mix to expand. This process is called rising. These cells are the reason behind the lightweight and insulating properties of bauroc products. Once the rising process is over, green-cake is allowed to settle and cure for some time. This ensures the cutting strength required for wire cutting. Usually rising and the pre-curing process takes around 4-6 hours.

At end of the pre-curing process, green-cake will achieve cutting strength and will be sent by a crane to cutting line using flat-cake technology and two cutting machines.

During cutting process, the top and side layers will be removed of crust in the green stage. This crust is recycled and afterwards reused in production process. After cutting, the products are transported into the autoclave (a large pressure vessel), where the curing process is completed.

Autoclaving is required to achieve the desired structural properties and dimensional stability. The process takes about 10 to 12 hours under a high pressure and a temperature.

The final manufacturing process stage is sorting and packaging blocks on wooden pallets and covering with plastic wrap . Eventually, the elements are moved out and transported to the construction site.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site cover direct exhaust emissions of fuel, environmental impacts of fuel production, as well as related infrastructure emissions. Optional A5 module is not declared.

PRODUCT USE AND MAINTENANCE (B1-B7)

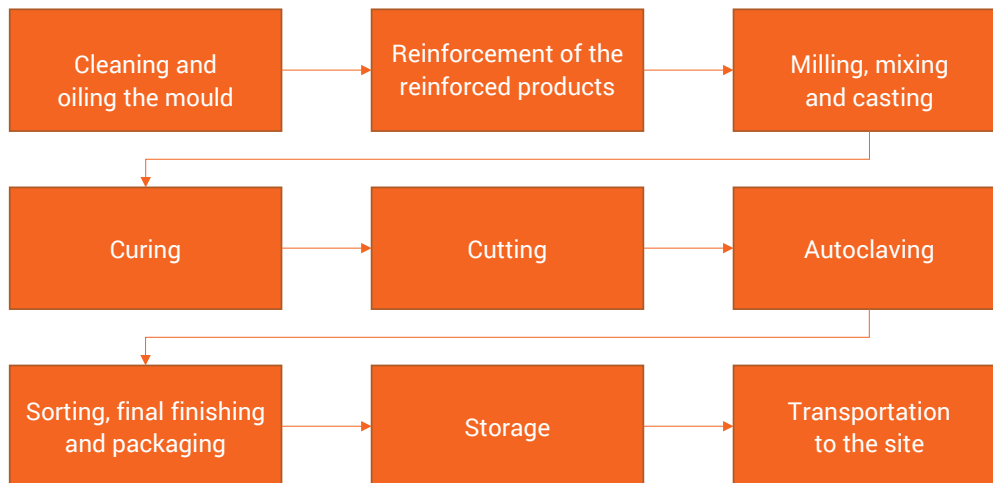
This EPD does not cover use phase. Air, soil and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

At the end-of-life, in the demolition phase 100% of the waste is assumed to be collected as separate construction waste (C1). All of end-of-life product is assumed to be sent to the closest facilities (C2).

92% of concrete and 100% of steel is recycled (C3) and the remaining is sent to local landfill for disposal (C4). Due to the recycling potential of concrete, the end-of-life product is converted into recycled raw materials (D).

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	Manufacturer data for the calendar year 2020 is used
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DECLARED AND FUNCTIONAL UNIT

Declared unit	1 m ³ (1 cubic meter)
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Mass per declared unit	500 / 525 kg/m ³
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Functional unit	-
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Products with the average density of 500 kg/m³	<ul style="list-style-type: none"> • Loadbearing LINTEL (500 kg/m³)
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Products with the average density of 525 kg/m³	<ul style="list-style-type: none"> • WALL ELEMENT (500 kg/m³) • FLOOR ELEMENT (500 kg/m³) • Non-loadbearing LINTEL (500 kg/m³) • STANDING WALL ELEMENT (575 kg/m³)
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BIOGENIC CARBON CONTENT

The product itself does not contain biogenic carbon. Packaging contains biogenic carbon.

Biogenic carbon content in product, kg C	-
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Biogenic carbon content in packaging, kg C	26,1
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SYSTEM BOUNDARY

This EPD covers cradle to gate with modules C1-C4 and module D; A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary is included.

	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	D	D	
Raw materials	x																			
Transport	x																			
Manufacturing	x																			
Transport	x																			
Assembly					MND															
Use					MND															
Maintenance					MND															
Repair					MND															
Replacement					MND															
Refurbishment					MND															
Operational energy use					MND															
Operational water use					MND															
Deconstr./demol.													x							
Transport													x							
Waste processing													x							
Disposal													x							
Reuse																	x			
Recovery																	x			
Recycling																		x		

Modules not declared = MND. Modules not relevant = MNR.

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and RTS 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 which data are available for are included in the calculation. There is no neglected unit process more than 1% of total mass and energy flows. The total neglected input and output flows do also not exceed 5% of energy usage or mass. The life cycle analysis includes all industrial processes from raw material acquisition to production, distribution, and end-of-life stages.

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.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

The allocation is made in accordance with the provisions of EN 15804. Allocation is based on annual production rate. Heat, electricity and other energy use as well as waste in production are calculated as a weight average per produced cubic meter of all products using yearly production data and rate for 2020.

Carbonation is not taken into account in the calculations. Carbonation is a natural process occurring when carbon dioxide is emitted during cement production is

rebound to the concrete during use and end of life stages of a building.

This LCA study is conducted in accordance with all methodological considerations, such as performance, system boundaries, data quality, allocation procedures, and decision rules to evaluate inputs and outputs. All estimations and assumptions are given below:

Module A1: Raw material composition is an average value calculated using total annual material consumption for the product by mass within the studied year 2020.

Module A3: Electricity used during manufacturing is hydroelectricity from Finland.

Module A4: Transportation from the manufacturing plant to the building site has been calculated using a most likely scenario, an export to Latvia. The scenario is estimating the distance to be 364 km with a truck and the fill rate to be 75%. The transportation doesn't cause losses as products are packaged properly. Bulk density varies depending on product type and thickness and is calculated as an approximate.

Module C1: Module C1: Energy consumption of demolition process is on the average 10 kWh/m² (Bozdağ, Ö & Seçer, M. 2007). An average mass of a concrete building is about 1000 kg/m². Therefore, energy consumption demolition is 10 kWh/ 1000 kg=0,01 kWh/kg.

LIFE CYCLE STAGES DIAGRAM

Module C2: It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed to have the same weight with the declared product. All of the end-of-life product is assumed to be sent to the closest facilities such as recycling and landfill. Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is assumed as lorry, which is most common.

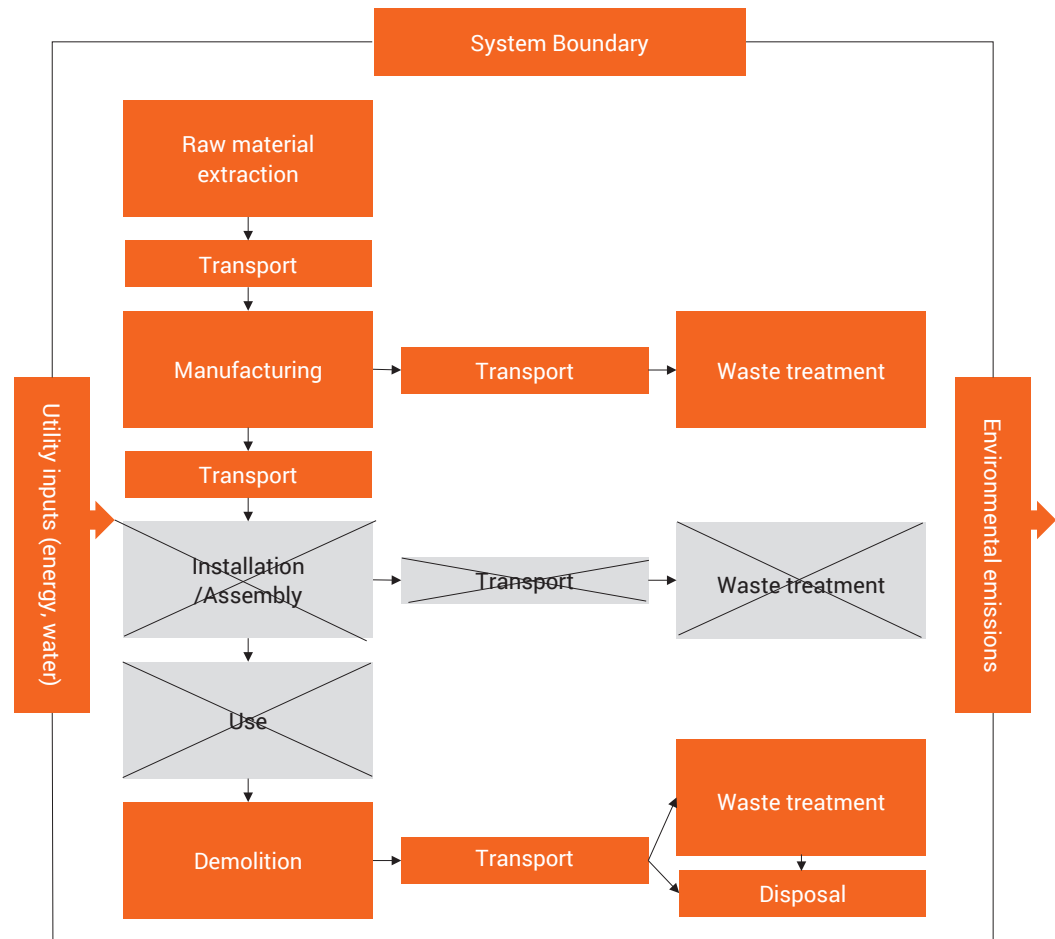
Module A2 & C2: Vehicle capacity utilization volume factor is assumed to be 1 which means full load. In reality, it may vary but as role of transportation emission in total results is small and so the variety in load assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by transportation company to serve needs of other clients.

Module C3: It is assumed that 92% of the concrete and 100% of steel waste is recycled. This assumption is based on information from a study by T.Ideon and M. Osjamets (2010) procured by the Estonian Ministry of Environment.

Module C4: The remaining waste materials are assumed to be sent to the landfill.

AVERAGES AND VARIABILITY

The reinforced autoclaved aerated elements have been grouped into 2 groups. The GWP results of the products belonging to one group do not differ more than 10%. The LCA results are calculated as an average product for each group.



ENVIRONMENTAL IMPACT DATA

NOTE: ENVIRONMENTAL IMPACTS - EN 15804+A1, CML / ISO 21930 ARE PRESENTED IN ANNEX.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3		A4		A5	B1-B7
		525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³		
Climate change – total	kg CO ₂ e	1,56E2	1,91E2	1,35E1	1,29E1	MND	MND
Climate change – fossil	kg CO ₂ e	1,85E2	2,23E2	1,36E1	1,31E1	MND	MND
Climate change – biogenic	kg CO ₂ e	-3,01E1	-3,23E1	9,9E-3	9,48E-3	MND	MND
Climate change – LULUC	kg CO ₂ e	7,29E-1	8,3E-1	4,1E-3	3,93E-3	MND	MND
Ozone depletion	kg CFC11e	1,28E-5	1,81E-5	3,2E-6	3,07E-6	MND	MND
Acidification	mol H ⁺ e	4,67E-1	6,17E-1	5,72E-2	5,48E-2	MND	MND
Eutrophication, aquatic freshwater ²⁾	kg Pe	2,63E-3	3,9E-3	1,11E-4	1,06E-4	MND	MND
Eutrophication, aquatic marine	kg Ne	1,25E-1	1,59E-1	1,72E-2	1,65E-2	MND	MND
Eutrophication, terrestrial	mol Ne	1,43E0	1,82E0	1,9E-1	1,83E-1	MND	MND
Photochemical ozone formation	kg NMVOCe	4,2E-1	5,88E-1	6,12E-2	5,87E-2	MND	MND
Abiotic depletion, minerals & metals	kg Sbe	1,54E-3	1,91E-3	2,33E-4	2,23E-4	MND	MND
Abiotic depletion of fossil resources	MJ	1,49E3	2,07E3	2,12E2	2,03E2	MND	MND
Water use ¹⁾	m ³ e depr.	3,55E1	6,53E1	7,88E-1	7,55E-1	MND	MND

Impact category	Unit	C1		C2		C3		C4		D	
		525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³
Climate change – total	kg CO ₂ e	1,73E0	1,65E0	2,39E0	2,27E0	3,23E0	6,65E0	2,11E-1	1,73E-1	-3,85E0	-3,15E0
Climate change – fossil	kg CO ₂ e	1,73E0	1,65E0	2,39E0	2,27E0	3,23E0	6,65E0	2,11E-1	1,73E-1	-3,84E0	-3,15E0
Climate change – biogenic	kg CO ₂ e	4,81E-4	4,58E-4	1,73E-3	1,65E-3	8,98E-4	1,85E-3	4,18E-4	3,43E-4	-6,91E-3	-5,66E-3
Climate change – LULUC	kg CO ₂ e	1,46E-4	1,39E-4	7,18E-4	6,84E-4	2,73E-4	5,62E-4	6,27E-5	5,13E-5	-1,44E-3	-1,18E-3
Ozone depletion	kg CFC11e	3,74E-7	3,56E-7	5,61E-7	5,34E-7	6,97E-7	1,44E-6	8,69E-8	7,12E-8	-1,3E-6	-1,07E-6
Acidification	mol H ⁺ e	1,81E-2	1,72E-2	1E-2	9,54E-3	3,38E-2	6,96E-2	2E-3	1,64E-3	-3,18E-2	-2,6E-2
Eutrophication, aquatic freshwater ²⁾	kg Pe	7E-6	6,66E-6	1,94E-5	1,85E-5	1,31E-5	2,69E-5	2,55E-6	2,09E-6	-5E-5	-4,1E-5
Eutrophication, aquatic marine	kg Ne	7,99E-3	7,61E-3	3,02E-3	2,88E-3	1,49E-2	3,07E-2	6,9E-4	5,65E-4	-1,1E-2	-9,05E-3
Eutrophication, terrestrial	mol Ne	8,77E-2	8,35E-2	3,33E-2	3,18E-2	1,64E-1	3,37E-1	7,6E-3	6,22E-3	-1,22E-1	-9,97E-2
Photochemical ozone formation	kg NMVOCe	2,41E-2	2,3E-2	1,07E-2	1,02E-2	4,5E-2	9,26E-2	2,21E-3	1,81E-3	-3,51E-2	-2,87E-2
Abiotic depletion, minerals & metals	kg Sbe	2,64E-6	2,52E-6	4,07E-5	3,88E-5	4,93E-6	1,02E-5	1,93E-6	1,58E-6	-5,44E-5	-4,46E-5
Abiotic depletion of fossil resources	MJ	2,38E1	2,27E1	3,71E1	3,53E1	4,44E1	9,15E1	5,9E0	4,83E0	-8,94E1	-7,32E1
Water use ¹⁾	m ³ e depr.	4,44E-2	4,23E-2	1,38E-1	1,31E-1	8,29E-2	1,71E-1	2,73E-1	2,23E-1	-3,24E0	-2,65E0

EN 15804+A2 disclaimer for Abiotic depletion and Water use indicators and all 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 experienced with the indicator.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3		A4		A5	B1-B7
		525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³		
Renewable PER used as energy ⁴⁾	MJ	3,04E2	3,6E2	2,67E0	2,56E0	MND	MND
Renewable PER used as materials	MJ	2,82E2	3,33E2	0.00E+00	0.00E+00	MND	MND
Total use of renewable PER	MJ	5,86E2	6,93E2	2,67E0	2,56E0	MND	MND
Non-renew. PER used as energy	MJ	1,44E3	2,03E3	2,12E2	2,03E2	MND	MND
Non-renew. PER used as materials	MJ	4,83E1	4,83E1	0.00E+00	0.00E+00	MND	MND
Total use of non-renewable PER	MJ	1,49E3	2,07E3	2,12E2	2,03E2	MND	MND
Use of secondary materials	kg	7,19E-1	1,79E0	0.00E+00	0.00E+00	MND	MND
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND
Use of net fresh water	m ³	1,75E0	2,24E0	4,41E-2	4,23E-2	MND	MND

Impact category	Unit	C1		C2		C3		C4		D	
		525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³
Renewable PER used as energy ⁴⁾	MJ	1,29E-1	1,23E-1	4,67E-1	4,45E-1	2,4E-1	4,95E-1	4,77E-2	3,91E-2	-1,11E0	-9,12E-1
Renewable PER used as materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable PER	MJ	1,29E-1	1,23E-1	4,67E-1	4,45E-1	2,4E-1	4,95E-1	4,77E-2	3,91E-2	-1,11E0	-9,12E-1
Non-renew. PER used as energy	MJ	2,38E1	2,27E1	3,71E1	3,53E1	4,44E1	9,15E1	5,9E0	4,83E0	-8,94E1	-7,32E1
Non-renew. PER used as materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable PER	MJ	2,38E1	2,27E1	3,71E1	3,53E1	4,44E1	9,15E1	5,9E0	4,83E0	-8,94E1	-7,32E1
Use of secondary materials	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m ³	2,1E-3	2E-3	7,73E-3	7,36E-3	3,92E-3	8,09E-3	6,45E-3	5,29E-3	-7,88E-2	-6,46E-2

PER abbreviation stands for primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1-A3		A4		A5	B1-B7
		525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³		
Hazardous waste	Kg	5,16E0	1,06E1	2,06E-1	1,97E-1	MND	MND
Non-hazardous waste	Kg	2,51E2	3,79E2	2,28E1	2,18E1	MND	MND
Radioactive waste	Kg	4,68E-3	7,01E-3	1,45E-3	1,39E-3	MND	MND

Impact category	Unit	C1		C2		C3		C4		D	
		525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³
Hazardous waste	Kg	2,56E-2	2,44E-2	3,61E-2	3,43E-2	0,00E+00	0,00E+00	5,5E-3	4,51E-3	-9,72E-2	-7,96E-2
Non-hazardous waste	Kg	2,74E-1	2,61E-1	3,99E0	3,8E0	0,00E+00	0,00E+00	4,01E1	3,28E1	-4,61E2	-3,77E2
Radioactive waste	Kg	1,67E-4	1,59E-4	2,55E-4	2,43E-4	0,00E+00	0,00E+00	3,9E-5	3,2E-5	-5,93E-4	-4,86E-4

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3		A4	A5	B1-B7	C1	C2	C3		C4	D
		525 kg/m ³	500 kg/m ³						525 kg/m ³	500 kg/m ³		
Components for reuse	Kg	0,00E+00	0,00E+00	0,00E+00	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	Kg	3,09E0	3,09E0	0,00E+00	MND	MND	0,00E+00	0,00E+00	4,85E2	4,67E2	0,00E+00	0,00E+00
Materials for energy recovery	Kg	3,15E0	5,54E0	0,00E+00	MND	MND	0,00E+00	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	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1-A3		A4		A5	B1-B7
		525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³		
Climate change – total	kg CO ₂ e	3,12E-1	3,83E-1	2,73E-2	2,61E-2	MND	MND
Abiotic depletion, minerals & metals	kg Sbe	3,08E-6	3,82E-6	4,65E-7	4,46E-7	MND	MND
Abiotic depletion of fossil resources	MJ	2,98E0	4,15E0	4,24E-1	4,06E-1	MND	MND
Water use	m ³ e depr.	7,1E-2	1,31E-1	1,58E-3	1,51E-3	MND	MND
Use of secondary materials	kg	1,44E-3	3,58E-3	0.00E+00	0.00E+00	MND	MND
Biogenic carbon content in product	kg C	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A
Biogenic carbon content in packaging	kg C	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A

Impact category	Unit	C1		C2		C3		C4		D	
		525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³
Impact category	Unit	3,46E-3	3,3E-3	4,78E-3	4,55E-3	6,46E-3	1,33E-2	4,23E-4	3,47E-4	-7,7E-3	-6,31E-3
Climate change – total	kg CO ₂ e	5,29E-9	5,03E-9	8,14E-8	7,75E-8	9,86E-9	2,03E-8	3,86E-9	3,16E-9	-1,09E-7	-8,92E-8
Abiotic depletion, minerals & metals	kg Sbe	4,76E-2	4,54E-2	7,42E-2	7,07E-2	8,88E-2	1,83E-1	1,18E-2	9,67E-3	-1,79E-1	-1,46E-1
Abiotic depletion of fossil resources	MJ	8,89E-5	8,46E-5	2,76E-4	2,63E-4	1,66E-4	3,41E-4	5,46E-4	4,47E-4	-6,48E-3	-5,31E-3
Water use	m ³ e depr.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of secondary materials	kg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic carbon content in product	kg C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

SCENARIO DOCUMENTATION

MANUFACTURING ENERGY SCENARIO DOCUMENTATION

Scenario parameter	Value
Electricity data source and quality	Electricity production, hydro, reservoir, non-alpine region (Reference product: electricity, high voltage), Finland, Ecoinvent 3.6, year: 2019
Electricity CO ₂ e / kWh	0.0487
Diesel data source and quality	Diesel, burned in building machine (Reference product: diesel, burned in building machine), World, Ecoinvent 3.6, year: 2019
Diesel CO ₂ e / kWh	0.327
Heating data source and quality	Heat production, natural gas, at industrial furnace >100kw (Reference product: heat, district or industrial, natural gas), Europe, Ecoinvent 3.6, year: 2019
Heating CO ₂ e / kWh	0.247

TRANSPORT SCENARIO DOCUMENTATION

Scenario parameter	Value
A4 Truck >32 metric ton Euro 5, kgCO ₂ e / tonkm	0.0902
A4 average transport distance, Truck, km	364
Transport capacity utilization, %	75
Bulk density of transported products, kg/m ³	500/525
Volume capacity utilisation factor for nested packaged products	1

END OF LIFE SCENARIO DOCUMENTATION

Scenario parameter	Value	
	500 kg/m ³	525 kg/m ³
Collection process – kg collected separately	500	525
Collection process – kg collected with mixed waste	0	0
Recovery process – kg for re-use	0	0
Recovery process – kg for recycling	377	461
Recovery process – kg for energy recovery	0	0
Disposal (total) – kg for final deposition	33	40
Scenario assumptions e.g. transportation (kg)	50	50

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ABOUT THE MANUFACTURER

Bauroc group, with headquarter in Estonia, is the largest producer of aircrete i.e. autoclaved aerated concrete (AAC) products in the Northern Europe. The family owned group which was established 2001, operates two state of the art AAC factories in Estonia and Latvia. The machinery of both plants come from two of the most famous German manufacturers -Wehrhahn and Hess.

The brand “**bauroc**” symbolize a wide range of building products from autoclaved aerated concrete, which are used throughout the field of construction. Word “bau” is “construction” in German language and second part of the word “roc” means, that all products are made from ecological stone material – natural mineral-based autoclaved aerated concrete.

High quality, purely natural and mineral raw materials as well as modern technology guarantee that bauroc products are among the leading autoclaved aerated concrete products worldwide thanks to their technical properties. Bauroc is a member of the European Autoclaved Aerated Concrete Association EAACA and all products have the CE certification. Thanks to high quality products, the bauroc brand has become popular in many countries. Bauroc wide range of products are sold in Estonia, Latvia, Lithuania, Sweden, Finland, Denmark, Iceland, Poland, Switzerland and Germany.

There has been continuous process in product development and product mix has increased significantly during 20 years in business. Bauroc product portfolio includes wide range of block products, reinforced lintels, large roof and wall elements, instruments, dry mixes and accessories for installing the products.

We are not speaking only about very light aircrete products, but much larger product mix.

Bauroc brand can be recognised from bright orange colour, all products have been wrapped in orange folio during the whole 20 years in business.



EPD AUTHOR AND CONTRIBUTORS

Production of **bauroc** factory has production control certificates and CE-marking.

Manufacturer	Bauroc AS
EPD author	Anni Oviir, Anette Iital Rangi Maja OÜ, www.lcasupport.com
EPD verifier	Silvia Vilčeková, Silcert, s.r.o.
EPD program operator	The Building Information Foundation RTS sr
Background data	This EPD is based on Ecoinvent 3.6 (cut-off) database
LCA software	The LCA has been created using One Click LCA Pre-Verified EPD Generator for Cementitious Products

ANNEX: ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1-A3		A4		A5	B1-B7
		525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³		
Global warming potential	kg CO ₂ e	1,84E2	2,21E2	1,35E1	1,29E1	MND	MND
Depletion of stratospheric ozone	kg CFC11e	1,03E-5	1,47E-5	2,55E-6	2,44E-6	MND	MND
Acidification	kg SO ₂ e	3,32E-1	4,34E-1	2,77E-2	2,66E-2	MND	MND
Eutrophication	kg PO4 3e	1,36E-1	1,85E-1	5,6E-3	5,37E-3	MND	MND
Photochemical ozone formation	kg C2H4e	1,89E-2	2,87E-2	1,76E-3	1,68E-3	MND	MND
Abiotic depletion of non-fossil res.	kg Sbe	1,54E-3	1,91E-3	2,33E-4	2,23E-4	MND	MND
Abiotic depletion of fossil resources	MJ	1,49E3	2,07E3	2,12E2	2,03E2	MND	MND

Impact category	Unit	C1		C2		C3		C4		D	
		525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³	525 kg/m ³	500 kg/m ³
Global warming potential	kg CO ₂ e	1,72E0	1,64E0	2,36E0	2,25E0	3,2E0	6,6E0	2,07E-1	1,7E-1	-3,78E0	-3,1E0
Depletion of stratospheric ozone	kg CFC11e	2,96E-7	2,82E-7	4,46E-7	4,25E-7	5,52E-7	1,14E-6	6,89E-8	5,64E-8	-1,04E-6	-8,48E-7
Acidification	kg SO ₂ e	2,55E-3	2,43E-3	4,85E-3	4,62E-3	4,76E-3	9,82E-3	8,35E-4	6,84E-4	-1,35E-2	-1,11E-2
Eutrophication	kg PO4 3e	4,5E-4	4,29E-4	9,8E-4	9,34E-4	8,39E-4	1,73E-3	1,62E-4	1,32E-4	-2,92E-3	-2,39E-3
Photochemical ozone formation	kg C2H4e	2,63E-4	2,51E-4	3,08E-4	2,93E-4	4,91E-4	1,01E-3	6,12E-5	5,02E-5	-9,25E-4	-7,58E-4
Abiotic depletion of non-fossil res.	kg Sbe	2,64E-6	2,52E-6	4,07E-5	3,88E-5	4,93E-6	1,02E-5	1,93E-6	1,58E-6	-5,44E-5	-4,46E-5
Abiotic depletion of fossil resources	MJ	2,38E1	2,27E1	3,71E1	3,53E1	4,44E1	9,15E1	5,9E0	4,83E0	-8,94E1	-7,32E1

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