Environmental Product Declaration

Sanitaryware



In accordance with
ISO 14021
EN 15804+A2:2019

Roca

Summary

General information 03
- Manufacturer 03
- Standards, scope and verification 03
- Product 04
- Environmental data summary 04

Product and manufacturer 05
- About the manufacturer 05
- Product description 05
- Product raw material main composition 06
- Biogenic carbon content 06
- Functional unit and service life 06
- REACH – substances of very high concern (SVHC) 06

Product life-cycle 07
- System boundary 07
- Manufacturing and packaging (A1-A3) 08
- Transport and installation (A4-A5) 08
- Product use and maintenance (B1-B7) 08
- Product end of life (C1-C4, D) 08

Manufacturing process 09

Life-cycle assessment 12
- Cut-off criteria 12
- Allocation, estimates and assumptions 12
- Averages and variability 12
- LCA software and bibliography 12

Environmental impact data 13
- Core environmental impact indicators EN 15804+A2, PEF 13-14
- Use of natural resources 15
- End-of-life – waste 16
- Environmental impacts EN 15804+A1, CML / ISO 21930 17
- Verification process for this EPD 18
- Verification statement 18

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General information

Manufacturer

Manufacturer	Roca
Address	Avinguda Diagonal, 513, 08028 Barcelona, Spain
Contact details	roca@roca.com
Website	www.roca.com

Standards, scope and verification

Reference standard	ISO 14021 EN 15804+A2:2019+AC:2021 for Construction Products
Sector	Construction product
Category of EPD	Self-verified EPD
EPD Author	Sustainability Department
EPD Verification	Independent verification of this carbon footprint and data, according to ISO 14021: ☒ Internal certification ☐ External verification
EPD verifier	Sustainability Department, Roca Group

Product

Product name	Sanitaryware
Additional labels	-
Product reference	-
Place of production	Al Mansour (EG), Anadia (PT), Burgos (ES), Gava (ES), Leiria (PT), Settat (MO)
Period for data	2022
Averaging	Multiple products and multiple factories
Variation in GWP-fossil for A1-A3	50 %

Environmental data summary

Declared unit	1 kg sanitary ceramic
Declared unit mass	1 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	1.72
GWP-total, A1-A3 ($kgCO_2e$)	0.82
Secondary material, inputs (%)	0.03
Secondary material, outputs (%)	0.00
Total energy use, A1-A3 (kWh)	9.18
Total water use, A1-A3 (m^3e)	0.01

Product and manufacturer

About the manufacturer

Roca Group is a global enterprise dedicated to the production and sale of solutions that cover all the needs of the bathroom space with the aim of improving people's quality of life. Roca Group's corporate project, faithful to the entrepreneurial spirit of the family business, is characterised by a long-term strategy based on growth. The group's Mission and Vision establish an approach based on creating shared value with the aim of producing a threefold positive impact in the areas of People, Planet and Prosperity. Our commitment to the promotion of sustainable development is spread throughout our organisation. It finds itself on a strategic level, as well as embedded within specific actions and initiatives that ensure our daily tasks contribute to the improvement of our impact in a tangible way. Learn more at: https://rocagroup.com/sustainability/

Product description

Sanitaryware appliances mainly include basins, bidets, WCs, urinals, cisterns and shower trays, including the accessories mentioned above. These products are made of materials such as clay, kaolin, quartz and feldspar. After the preparation of the slip, the mixture is cast, dried, glazed and then finished to obtain sanitaryware. To calculate the environmental impact, a representative average sanitaryware product based on the total volume manufactured in 2022 has been considered.

The products are available in different sizes, designs, and weights. In the following table are listed the sanitary products and their average weights.

Basins	16,0 kg
Bidets	24,5 kg
WC	38,0 kg
Urinals	37,0 kg
Cisterns	11,0 kg
Shower trays	36,5 kg

Further information can be found at www.roca.com.

Product raw material main composition

Raw material category	Amount, mass- %	Material origin
Metals	0	-
Minerals	100	Europe, Africa, Asia
Fossil materials	0	-
Bio-based materials	0	-

Biogenic carbon content

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product	0 kg C
Biogenic carbon content in packaging	0.052 kg C

Functional unit and service life

Declared unit	1 kg sanitary ceramic
Mass per declared unit	1 kg
Functional unit	-
Reference service life	Up to 40 years

Reach – substances of very high concern (SVHC)

The product does not contain any REACH SVHC substance in amounts greater than 0.1% (1,000ppm).

Product life-cycle

System boundary

This carbon footprint covers the life-cycle modules listed in the following table.

Product stage	A1	x	Raw materials
	A2	x	Transport
	A3	x	Manufacturing
Assembly stage	A4	MND	Transport
	A5	MND	Assembly
Use stage	B1	MND	Use
	B2	MND	Maintenance
	B3	MND	Repair
	B4	MND	Replacement
	B5	MND	Refurbishment
	B6	MND	Operational energy use
	B7	MND	Operational water use
End of life stage	C1	x	Deconstr./demol.
	C2	x	Transport
	C3	x	Waste processing
	C4	x	Disposal
Beyond the system boundaries	D	x	Reuse
		x	Recovery
		x	Recycling

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 a mixture of minerals like clay, feldspar, kaolin and quartz. The materials are transported to the manufacturers production facility, where the manufacturing includes material preparation, shaping, drying, followed by glazing/decoration, firing, and finally, polishing. The manufacturing process requires electricity and fuels for the different equipment as well as heating. In addition, waste heat is recycled from various parts of the furnaces to ensure that the heat inside the furnace remains efficient. The product is finally packaged and sent to the warehouse. Certain ancillary materials like water and moulds are also included. Production waste before firing is recycled internally. The product does not contain VOC as is fired at temperatures above 1000°C. Production waste as wastewater, moulds, sludge and fired ceramics waste are included. Transport from suppliers is calculated according to the corresponding sales volumes.

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. Module not declared.

Product use and maintenance (B1-B7)

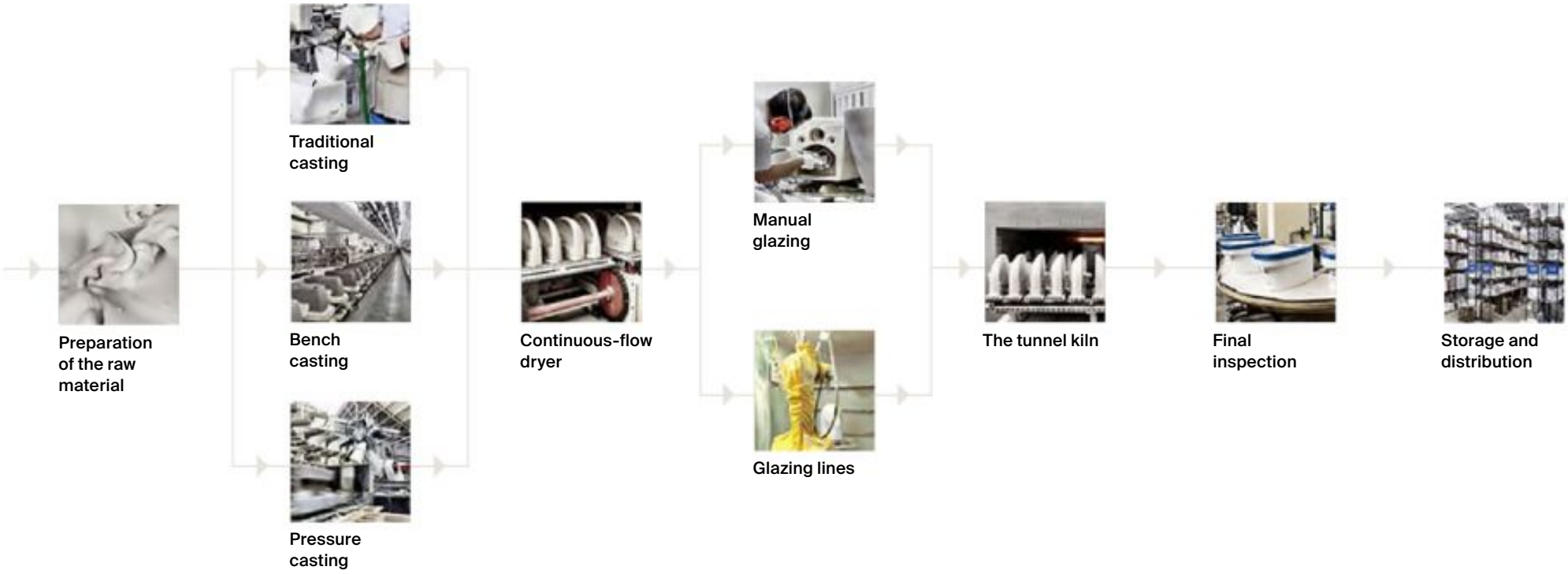
Air, soil, and water impacts during the use phase have not been studied. Module not declared.

Product end of life (C1-C4, D)

Energy consumption and natural resources of the disassembling end-of-life product and the impacts of demolition process are assumed to be zero due to the negligible consumptions (C1). Concerning to the end-of-life product, it is assumed to be sent to the closest waste disposal facility by lorry, estimated to be 50km away (C2). Although the product, fully mineral material, is suitable for reuse and recycling, it is conservatively assumed to be disposed of in an inert landfill. The benefits and loads of recycling of packaging waste are included in Module D.

Manufacturing process

Production process



The raw materials supplied are mainly stored in silos. A small percentage of the raw materials used is supplied in sacks and/or big-bags.

The stages of the production process are as follow:

Unloading of raw materials 1



Mineral raw materials (clay, kaolin, feldspar and silica) are unloaded from trucks in the areas marked for this purpose.

Preparation of the slip 2



The raw materials are taken to the mixer, where they are blended with osmotic water. The resulting mixture is sieved and pumped into the storage tanks and kept in suspension with the help of agitators. The paste resulting from this operation is known as slip.

Casting 3



Once the quality of the desired mixture has been obtained and controlled by the laboratory, the slip is pumped into the overhead casting tanks. From there, it feeds the casting lines by gravity, where it is injected into hermetically sealed plaster moulds, moulds in which the piece is formed.

Other pieces are also produced using plastic moulds with medium pressure slip injection, although to a lesser extent. The plaster moulds used are produced in the same plant and are manufactured by filling a mixture of plaster and water into araldite master moulds. After setting, the master moulds are separated and the plaster moulds are removed and transported to the dryers for their first dehydration prior to their use.

Drying 4



Once the piece has achieved a mechanical consistency within the plaster mould, it is removed manually or automatically, depending on the line or its difficulty. These pieces are placed on trolleys and transported to the different dryers, where they are dried with hot air. Once dry, they are transported again by trolleys, this time to the polishing and enamelling line.

Learn more at: https://www.roca.com/about-roca/design-innovation/manufacturing-processes

Enamelling 5



The enamel applied is prepared in an adjoining room where the raw materials, which are stored in silos, are weighed before being dissolved with osmotic water. The product obtained is fed into ball mills that reduce the base particles and pigments to the desired fineness.

Firing 6



The enamelled pieces are then transported to the kiln area for their firing. The process of heating, firing, enamel vitrification and cooling takes place inside the kiln.

Inspection and control 7



The pieces leaving the kiln are sent to the inspection and control area, where the defective pieces are separated from the conforming ones. Those that pass the final inspection are packed up and palletised for their transport to the dispatch warehouse. The complete cycle for the manufacturing of sanitary ware lasts approximately two to three days.

Learn more at: https://www.roca.com/about-roca/design-innovation/manufacturing-processes

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 materials	No allocation
Ancillary materials	No allocation
Manufacturing energy and waste	Allocation per mass

Averages and variability

Type of average	Multiple factories
Averaging method	Averaged by shares of total mass
Variation in GWP-fossil for A1-A3	50 %

Primary data represents the manufacturers manufacturing sites of Al Mansour (EG), Anadia (PT) , Burgos (ES), Gava (ES), Leiria (PT) and Settat (MO). The data was used to calculate average impacts for the product. The primary data was averaged by calculating a weighed average of the sites consumption of raw materials and energy, and production of wastes. The share of production volume per each site was used in the weighting. GWP Variation is caused by different share of product types produced and share of renewable electricity consumed per manufacturing site.

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

Section	Result category	Global Warming Potential total kg CO_2e	Global Warming Potential fossil kg CO_2e	Global Warming Potential biogenic kg CO_2e	Global Warming Potential, LULUC kg CO_2e	Depletion potential of the stratospheric ozone layer kg CFC11e	Acidification potential, Accumulated Exceedance mol H+ eq.
A1	Raw material extraction and processing	5,63E-02	5,62E-02	0,00E+00	6,18E-05	8,04E-09	3,15E-04
A2	Transport to the manufacturer	3,45E-02	3,45E-02	9,07E-08	1,55E-05	7,68E-09	3,68E-04
A3	Manufacturing	2,84E+00	5,11E+00	-2,29E+00	8,22E-03	5,55E-07	4,34E-02
A1-A3	Product stage	2,93E+00	5,20E+00	-2,29E+00	8,30E-03	5,71E-07	4,41E-02
A4	Transport to the building site	MND	MND	MND	MND	MND	MND
A5	Installation into the building	MND	MND	MND	MND	MND	MND
B1	Use or application of the product	MND	MND	MND	MND	MND	MND
B2	Maintenance	MND	MND	MND	MND	MND	MND
B3	Repair	MND	MND	MND	MND	MND	MND
B4	Replacement	MND	MND	MND	MND	MND	MND
B5	Refurbishment	MND	MND	MND	MND	MND	MND
B6	Operational energy use	MND	MND	MND	MND	MND	MND
B7	Operational water use	MND	MND	MND	MND	MND	MND
C1	Deconstruction	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
C2	Waste transportation	4,69E-03	4,69E-03	0,00E+00	1,73E-06	1,08E-09	1,99E-05
C3	Waste processing	2,69E-01	0,00E+00	2,69E-01	0,00E+00	0,00E+00	0,00E+00
C4	Waste disposal	6,39E-01	1,05E-02	6,28E-01	1,07E-05	3,20E-09	8,88E-05
D	External impacts (excluded from totals)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Core environmental impact indicators EN 15804+A2, PEF

Section	Result category	Eutrophication aquatic freshwater kg Pe	Eutrophication aquatic marine kg N eq.	Eutrophication terrestrial mol N eq.	Formation potential of tropospheric ozone kg NMVOC eq.	Abiotic depletion potential (ADP-elements) for non fossil resources (+A2) kg Sbe	Abiotic depletion potential (ADP-fossil fuels) for fossil resources (+A2) MJ	Water use m^3 deprived
A1	Raw material extraction and processing	2,80E-06	4,89E-05	5,63E-04	1,59E-04	7,96E-07	9,57E-01	4,18E-02
A2	Transport to the manufacturer	2,46E-07	9,63E-05	1,07E-03	2,99E-04	7,32E-08	4,98E-01	2,08E-03
A3	Manufacturing	5,75E-03	1,30E-01	1,22E-01	2,21E-02	4,61E-05	7,27E+01	2,77E+01
A1-A3	Product stage	5,76E-03	1,31E-01	1,24E-01	2,26E-02	4,70E-05	7,41E+01	2,78E+01
A4	Transport to the building site	MND	MND	MND	MND	MND	MND	MND
A5	Installation into the building	MND	MND	MND	MND	MND	MND	MND
B1	Use or application of the product	MND	MND	MND	MND	MND	MND	MND
B2	Maintenance	MND	MND	MND	MND	MND	MND	MND
B3	Repair	MND	MND	MND	MND	MND	MND	MND
B4	Replacement	MND	MND	MND	MND	MND	MND	MND
B5	Refurbishment	MND	MND	MND	MND	MND	MND	MND
B6	Operational energy use	MND	MND	MND	MND	MND	MND	MND
B7	Operational water use	MND	MND	MND	MND	MND	MND	MND
C1	Deconstruction	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
C2	Waste transportation	3,84E-08	5,90E-06	6,51E-05	2,08E-05	1,10E-08	7,05E-02	3,15E-04
C3	Waste processing	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
C4	Waste disposal	1,63E-07	3,03E-05	3,33E-04	9,64E-05	3,54E-08	2,43E-01	1,42E-03
D	External impacts (excluded from totals)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+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.

Use of natural resources

Section	Result category	Use of renewable primary energy resources as energy MJ	Use of renewable primary energy resources as raw materials MJ	Total use of renewable primary energy MJ	Use of non renewable primary energy as energy MJ	Use of non renewable primary energy as raw materials MJ	Total use of non renewable primary energy MJ	Use of secondary materials kg	Use of renewable secondary fuels MJ	Use of non renewable secondary fuels MJ	Use of net fresh water m^3
A1	Raw material extraction and processing	9,49E-02	0,00E+00	9,49E-02	9,56E-01	0,00E+00	9,56E-01	2,59E-04	1,60E-06	0,00E+00	1,82E-03
A2	Transport to the manufacturer	5,18E-03	0,00E+00	5,18E-03	4,98E-01	0,00E+00	4,98E-01	1,56E-04	1,24E-06	0,00E+00	5,80E-05
A3	Manufacturing	1,07E+01	7,86E+00	1,85E+01	7,05E+01	5,19E-01	7,10E+01	1,55E-01	2,67E-01	0,00E+00	5,39E+00
A1-A3	Product stage	1,08E+01	7,86E+00	1,86E+01	7,20E+01	5,19E-01	7,25E+01	1,56E-01	2,67E-01	0,00E+00	5,39E+00
A4	Transport to the building site	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
A5	Installation into the building	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B1	Use or application of the product	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B2	Maintenance	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B3	Repair	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B4	Replacement	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B5	Refurbishment	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B6	Operational energy use	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B7	Operational water use	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
C1	Deconstruction	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
C2	Waste transport	7,94E 04	0,00E+00	7,94E-04	7,05E-02	0,00E+00	7,05E-02	1,96E-05	1,97E-07	0,00E+00	9,13E-06
C3	Waste processing	0,00E+00	2,36E+00	2,36E+00	0,00E+00	1,56E 01	1,56E 01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
C4	Waste disposal	4,22E 03	5,50E+00	5,50E+00	2,43E-01	3,63E-01	1,20E-01	8,75E-05	3,37E-06	0,00E+00	2,62E-04
D	External impacts (excluded from totals)	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

End-of-life – waste

Section	Result category	Hazardous waste disposed kg	Non hazardous waste disposed kg	Radioactive waste disposed kg
A1	Raw material extraction and processing	3,22E 03	1,37E 01	4,34E 06
A2	Transport to the manufacturer	6,64E 04	9,80E 03	3,37E 06
A3	Manufacturing	4,87E 01	6,46E+01	2,03E 04
A1-A3	Product stage	4,91E 01	6,47E+01	2,10E 04
A4	Transport to the building site	MND	MND	MND
A5	Installation into the building	MND	MND	MND
B1	Use or application of the product	MND	MND	MND
B2	Maintenance	MND	MND	MND
B3	Repair	MND	MND	MND
B4	Replacement	MND	MND	MND
B5	Refurbishment	MND	MND	MND
B6	Operational energy use	MND	MND	MND
B7	Operational water use	MND	MND	MND
C1	Deconstruction	0,00E+00	0,00E+00	0,00E+00
C2	Waste transport	9,34E-05	1,54E-03	4,71E-07
C3	Waste processing	0,00E+00	0,00E+00	0,00E+00
C4	Waste disposal	0,00E+00	1,00E+00	0,00E+00
D	External impacts (excluded from totals)	0,00E+00	0,00E+00	0,00E+00

Environmental impacts EN 15804+A1, CML / ISO 21930

Section	Result category	Global warming kg CO_2e	Ozone Depletion kg CFC11e	Acidification kg SO2e	Eutrophication kg PO4e	Formation of ozone of lower atmosphere kg Ethenee	Abiotic depletion potential (ADP-elements) for non fossil resources kg Sbe	Abiotic depletion potential (ADP-fossil fuels) for fossil resources MJ
A1	Raw material extraction and processing	5,54E-02	7,24E-09	2,63E-04	1,08E-04	1,13E-05	3,00E-07	9,56E-01
A2	Transport to the manufacturer	3,41E-02	6,08E-09	2,92E-04	4,27E-05	8,67E-06	7,10E-08	4,98E-01
A3	Manufacturing	5,08E+00	4,71E-07	3,23E-02	8,52E-02	1,38E-03	4,30E-05	7,26E+01
A1-A3	Product stage	5,17E+00	4,84E-07	3,28E-02	8,54E-02	1,40E-03	4,34E-05	7,41E+01
A4	Transport to the building site	MND	MND	MND	MND	MND	MND	MND
A5	Installation into the building	MND	MND	MND	MND	MND	MND	MND
B1	Use or application of the product	MND	MND	MND	MND	MND	MND	MND
B2	Maintenance	MND	MND	MND	MND	MND	MND	MND
B3	Repair	MND	MND	MND	MND	MND	MND	MND
B4	Replacement	MND	MND	MND	MND	MND	MND	MND
B5	Refurbishment	MND	MND	MND	MND	MND	MND	MND
B6	Operational energy use	MND	MND	MND	MND	MND	MND	MND
B7	Operational water use	MND	MND	MND	MND	MND	MND	MND
C1	Deconstruction	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
C2	Waste transport	4,64E-03	8,55E-10	1,54E-05	3,52E-06	6,03E-07	1,07E-08	7,05E-02
C3	Waste processing	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
C4	Waste disposal	1,03E-02	2,54E-09	6,73E-05	2,15E-05	2,74E-06	3,42E-08	2,43E-01
D	External impacts (excluded from totals)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Verification process for this EPD

This EPD has been self-declared as per the ISO 14021 by the Sustainability Department of Roca Group

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