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cerámica - porcelánico

ENVIRONMENTAL PRODUCT DECLARATION

Porcelain tiles (Porcelain Stoneware Tiles)

(Group BIa, according EN 14411 and ISO 13006)

DECLARATION MADE BY:

CERÁMICAS APARICI S.A.

September 2025

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GENERAL INFORMATION

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Report reference C241122, September 2025.

CERÁMICAS APARICI, S.A.

Since 1961, **Cerámicas Aparici** has established itself as a pioneer in the manufacture of high quality ceramic and porcelain tiles. Recognised for its exceptional quality and focus on innovative design, the family-owned company is at the forefront of industry trends and developments, with a presence in markets around the world.

At **Cerámicas Aparici** we specialise in providing bespoke solutions for projects of all sizes, whether residential or public spaces, always meeting the highest standards of quality and design. In addition, we work closely with long-term business partners to guarantee the best sales service and to meet the needs of our clients.

For more information, please contact Cerámicas Aparici: info@aparici.com

THE PRODUCT

Identification of the product in the Environmental Product Declaration

This environmental product declaration provides environmental information on the life cycle of the ceramic tiles of CERÁMICAS APARICI considering the Spanish geographical and technological context in the year 2022.

These tiles are manufactured by Azulejos y Pavimentos, S.A. and by Tecnigres, S.A., both located in Sant Joan de Moró, Castellón, Spain.

The ceramic tiles included in this study belong to water absorption group BIa, according to the standard EN 14411:2016 (counterpart for standard ISO 13006:2018), i.e. ceramic tiles with water absorption ≤ 0.5%, commonly designated as Porcelain Stoneware Tile, hereinafter referred to as Porcelain Tiles.

The porcelain tiles included in this study include different models with different sizes. Specifically, the product sizes considered within the scope of the EPD are between 5.1 mm and 20 mm thick and with an average weight of 22.8 kg/m^2.

Representativeness of the Environmental Product Declaration

This Environmental Product Declaration contains environmental information about the ceramic tiles of CERÁMICAS APARICI belonging to water absorption group BIa (Porcelain tiles). It contains environmental information about a group of products, so the results presented set out the average environmental performance, weighted by the production of all formats included in the scope of this document. Additionally, the Annexes of this document present the environmental data of the tiles that exhibit a minimum and a maximum impact, thus delimiting the results obtained in the Life Cycle Assessment.

The Life Cycle Assessment (LCA) on which this declaration is based was performed according to standards ISO 14040 and ISO 14044 and the PCR document on construction products EN 15804:2012+A2.

This Environmental Product Declaration is valid for 5 years.

This EPD may not be comparable with those developed in other programs or under different reference documents; it may not be comparable with EPDs not prepared in

accordance with the EN 15804:2012+A2 standard. Similarly, EPDs may not be comparable if the origin of the data is different (e.g. databases), if not all relevant information modules are included or if they are not based on the same scenarios.

Comparison of construction products shall be done regarding the same function, using the same functional unit and building level (or architectural or engineering work), i.e. including the performance of the product throughout its life cycle and considering the specifications of section 6.7.2 of standards EN ISO 14025.

Functional unit

The functional unit is "*1 m^2 covering of a floor surface for 50 years with porcelain tiles (group BIa) considering different formats from 5.1 to 20 mm of thickness and 22.8 kg/m^2)".*

Application of the product

The product is intended for surface covering in both indoor and outdoor environments. The product can be used as floor covering, wall cladding, or even in façades. Moreover, the versatility of the product also allows this type of ceramic tile to be used in different environments, such as homes, shops, offices, and hospitals. For further information, please request the manufacturer's technical data sheet on the model involved.

Product features

The table below refers to the technical performance of porcelain tiles manufactured in CERÁMICAS APARICI:

Table 1 Product features

Feature	Calculating or testing method	Values	Units
Length (deviation W)	ISO 10545-2	±0,2	%
Thickness (deviation W)		±5	%
Straightness of lines		±0,5	%
Orthogonality		±0,5	%
Centre curvature		±0,5	%
Lateral curvature		±0,5	%
Warp curvature		±0,5	%
Superficial aspect		> 95	%
Water absorption	ISO 10545-3	≤ 0,5	%
Breaking strength (e≥7,5mm)	ISO 10545-4	≥2200	N
Breaking strength (e<7,5mm)		≥1200	N
Impact strength	ISO 10545-5	Available by product	
Deep abrasion	ISO 10545-6	Available by product	mm^3
Surface abrasion	ISO 10545-7	Available by product	
Thermal growth	ISO 10545-8	6,4-6,6 X 10^{-6}	1 / ºC
Thermal impact	ISO 10545-9	Meets	
Moisture expansion	ISO 10545-10	Available by product	
Cracking	ISO 10545-11	Meets	
Frost	ISO 10545-12	Meets	
Acid and Base Resistance (low concentration)	ISO 10545-13	Available by product	
Acid and Base Resistance (high concentration)		Available by product	
Household cleaning products and swimming pool salts		A	
Stain resistance	ISO 10545-14	5	
Pb and Cd extraction	ISO 10545-15	Available by product	
Slight differences in colour	ISO 10545-16	Available by product	
Slide	CEN/TS 16165	Available by product	
Reaction to fire (no mesh)	EN 13501-I	$A1_{FL}$/A1	
Reaction to fire (with mesh)		Available by product	
Adhesion	EN 12004	Type C2 >1 N/mm^2	
Tactile properties	CEN/TS 15209	Available by product	

LIFE CYCLE DESCRIPTION

Information modules and system boundaries

This environmental product declaration refers to the environmental performance of the porcelain tiles manufactured by CERÁMICAS APARICI, considering its entire life cycle, that is, from cradle to grave.

The system studied includes the following modules and processes:

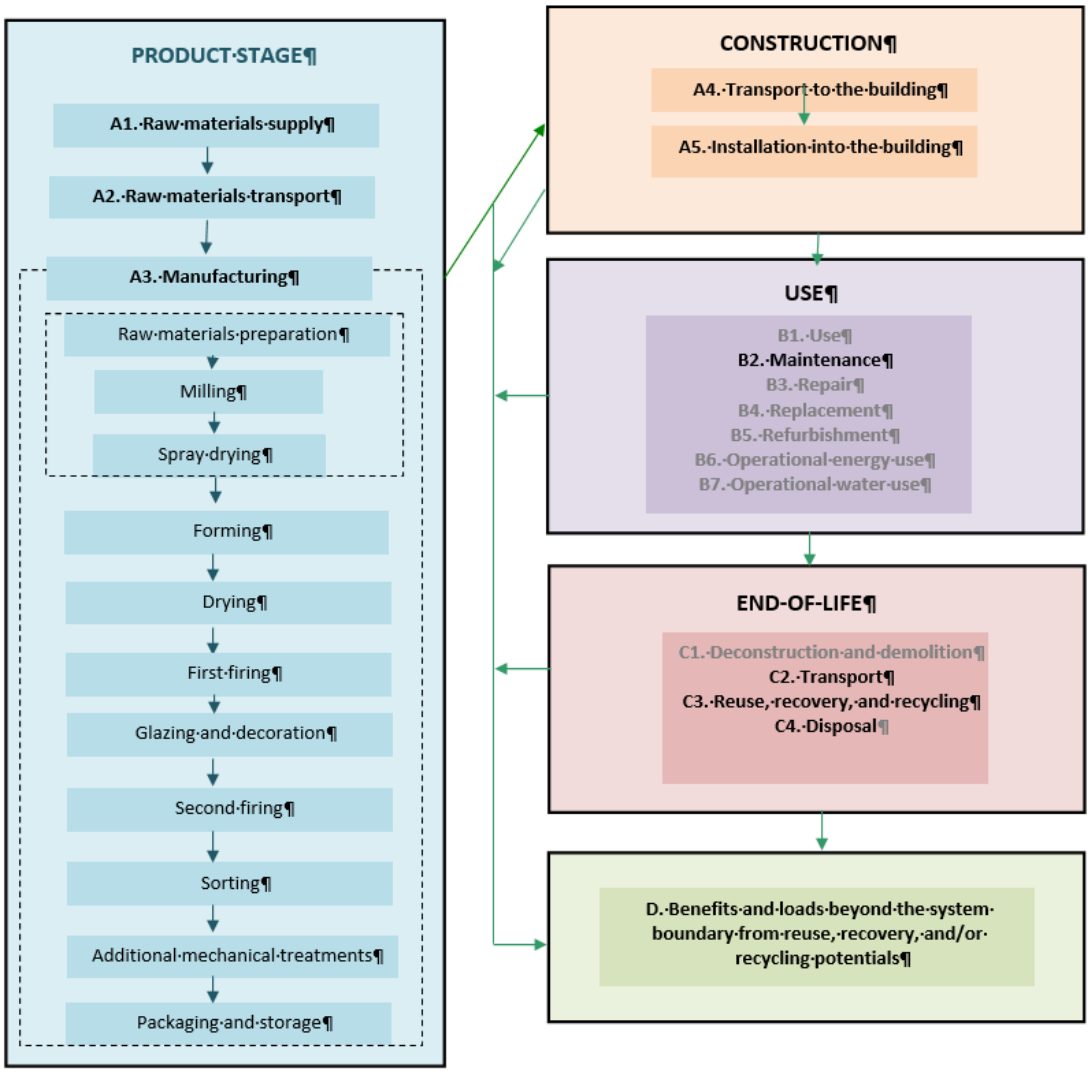

Figure 1 System boundaries

The following stages are included:

Product stage:

Raw materials extraction and processing (A1)

Transport to the manufacturer (A2)

Manufacturing (A3)

Construction:

Transport to the building site (A4)

Installation into the building (A5)

Use:

Use or application of the installed product (B1)

Maintenance (B2)

Repair (B3)

Replacement (B4)

Refurbishment (B5)

Operational energy use (B6)

Operational water use (B7)

End-of-life:

Deconstruction and demolition (C1)

Transport to waste processing (C2)

Waste processing for reuse, recovery, and/or recycling (C3)

Disposal (C4)

Module D: Benefits and loads beyond the system boundary from reuse, recovery, and/or recycling potentials

Life cycle description

PRODUCT STAGE

Raw materials supply (A1)

The porcelain tiles consist of a substrate composed of spray-dried granules formed by pressing, 98% of the total weight of the tile, and a thin decorative surface layer.

The decorative materials applied are grits, glazes, and digital inkjet inks.

None of the components of the final product are included on the Candidate List of Substances of Very High Concern for Authorization.

Raw materials transport (A2)

The raw materials for the support are transported by truck to the manufacturing plants in bulk, meaning they do not require packaging material. The decoration materials are produced by specialized companies located in the same region.

Manufacturing (A3)

After receiving the raw materials at the spray-dried granule production plant and storing them, they are dosed and mixed in the appropriate proportions. These raw materials undergo a wet milling process and subsequent drying to obtain spray-dried granules.

The spray-dried supplier companies have heat and power cogeneration systems installed in the spray dryer. Cogeneration generates electricity using the waste heat produced by combustion, through a system of steam turbines or engines. All hot gases are used in the spray dryer, and part of the generated electricity is used in the production process, thus reducing grid electricity requirements, and part is sold to the grid.

Once the spray-dried granules are manufactured, they are shipped in bulk in a 27-ton tipper truck from the spray-dried manufacturers to CERÁMICAS APARICI's tile manufacturing plants. Upon arrival at the factory, the spray-dried powder is unloaded into storage hoppers. Using a feed system with weight-controlled conveyor belts, the granules are directed to the forming stage.

The piece is then shaped by unidirectional dry pressing. The shaped pieces are then placed in a continuous dryer to reduce their humidity, thus doubling or tripling their mechanical strength and allowing for further processing.

The glazing and decoration process consists of applying one or more layers of glazes, slips, and inks using various techniques.

Firing is the most important stage of the ceramic tile production process, as it is the moment in which the previously shaped pieces undergo a fundamental change in their properties, resulting in a hard material that is resistant to water and chemicals. The product is fired in single-layer roller kilns.

Some of these pieces undergo a double-firing process. The pieces fresh from the dryer undergo an initial firing at this stage, while the rest undergo a single firing process after the glazing and decoration process.

Once fired, additional mechanical treatments are applied to the pieces that require it to give them specific characteristics. The most common treatments are polishing (increasing the shine of the piece's surface after subjecting it to an abrasion process) and grinding (mechanically treating the edges of the pieces so that there are no visible joints between them when installed).

After passing the quality control processes, also known as sorting, the pieces are packed using cardboard, pallets, and polyethylene. Once the pallet is formed, it is stored in the plant's logistics area.

To reduce atmospheric emissions at the various points, bag filters and wet filters are used; The former are made of a textile membrane that is permeable to gases but retains dust, while in wet filters a curtain or shower of recycled water carries away the dust particles.

CONSTRUCTION

Transport to the building (A4)

34% of the product is distributed within Spain, 27% in Europe, and 39% to the rest of the world.

The distances presented in Table 2 for the three product transport scenarios have been established based on the assumptions set out in the EN 17160 CPR for ceramic coatings.

Table 2. Scenarios applied for transporting the product to the installation site.

Destination	Means of transport	Distance (km)
National (Spain)	27 t truck	300
Europe	27 t truck	1390
Rest of the world	Transoceanic freighter	6250

For road transport, a 27-tonne EURO 6 truck was considered. For transcontinental transport, a medium-sized ocean-going freighter was used. All processes used are included in the [GaBi v.10] database.

Table 3. TECHNICAL INFORMATION. Construction process stage. Transport to the construction site.

Parameter	Result
Fuel type and consumption	0.59 l/m^2 diesel (27t truck) and 0.0114 l/m^2 fuel oil (freighter)
Distance	34% in Spain (300 km), 27% to the resto f Europe (1390 km) and 39% to the rest of the world (6250 km)
Capacity utilisation (including empty returns)	85% in trucks 100% freigther
Bulk density of the transported products	415 kg/m^3
Volume capacity utilisation factor (factor: =1 or < 1 or ≥ 1 for compressed or nested packaged products)	0.20

Installation into the building (A5)

Once the product is unpacked, it is installed. Based on the data obtained and in order to implement a real-life scenario, it has been determined that rapid-setting mortar is required for installation.

Waste from the packaging of the parts is managed separately based on the geographical location of the installation site.

Table 4. TECHNICAL INFORMATION. Construction process stage. Installation into the building

Parameter	Result
Ancillary materials for installation:	
Material 1: Cementitious adhesive	3.5 kg/m^2
Use of fresh water	0.88 l/m^2
Use of other resources	Not applicable
Quantitative description of energy type (regional mix) and consumption during the installation process	Not applicable
Wastage of materials on the construction site before waste processing, generated by the product's installation (specified by type)	Packaging waste: Cardboard: 0.23 kg Plastic: 0.03 kg Wood: 0.54 kg
Output materials (specified by type) as a result of waste processing at the construction site	Recycled cardboard: 223 g Landfilled cardboard: 2 g Incinerated plastic: 1 g Recycled plastic: 19 g Landfilled plastic: 7 g Recycled wood: 517 g Landfilled wood: 20 g
Direct emissions to ambient air, soil, and water	Not applicable

USE (B1-B7)

Once installed, porcelain tiles do not require any energy input for its use, nor does it require maintenance, except for normal cleaning operations. For this reason, of all the modules, only the environmental loads attributable to product maintenance (module B2) are considered.

According to CERÁMICAS APARICI, the reference lifespan of the product will be the same as that of the building where it is installed, since, provided it is installed correctly, it is a durable product and therefore not easily replaceable. A lifespan of 50 years has been considered.

Table 5. TECHNICAL INFORMATION. Reference service life.

Parameter	Result
Reference service life	At least 50 years
Declared product properties (at the gate) and finishes, etc.	Values of the relevant characteristics according to standard EN 14411, Annex G Information included in the manufacturer's technical data sheet, according to the model.
Design application parameters (manufacturer's instructions), including the references to appropriate practices	APAVISA PORCELANICO has instructions for installation, cleaning, and maintenance of ceramic tiles
An assumed quality of work, when installed in accordance with the manufacturer's instructions	APAVISA PORCELANICO has instructions for installation, cleaning, and maintenance of ceramic tiles
Outdoor environment (for outdoor applications), e.g. weathering, pollutants, UV radiation and wind exposure, building orientation, shading, temperature	Values of the relevant characteristics according to standard EN 14411, Annex G Information included in the manufacturer's technical data sheet, according to the model.
Indoor environment (indoor applications), e.g. temperature, moisture, chemical exposure	Values of the relevant characteristics according to standard EN 14411, Annex G Information included in the manufacturer's technical data sheet, according to the model.
Usage conditions, e.g. frequency of use, mechanical exposure	Information included in the manufacturer's technical data sheet according to the model.
Maintenance, e.g. required frequency, type and quality and replacement of replaceable components	APAVISA PORCELANICO has instructions for installation, cleaning, and maintenance of ceramic tiles

Maintenance (B2)

Cleaning is done with a damp cloth, and if the surface is dirty or greasy, cleaning agents such as detergents or bleach can be added. This study considered a residential use scenario, with weekly cleaning with water and disinfectant.

Table 6. *TECHNICAL INFORMATION. Use stage related to the building*

Parameter	Result
B2 MAINTENANCE	
Maintenance process	Washing once a week with water and washing with water and detergent every 2 weeks (residential use)
Maintenance cycle	Not applicable
Ancillary materials for maintenance (e.g. cleaning agent) (specify materials)	Detergent: 1.34E-04 kg/washing
Wastage material during maintenance (specify materials)	Not applicable
Net fresh water consumption	0.1 l/washing

Parameter	Result
Energy input during maintenance (e.g. vacuum cleaning), energy carrier type (e.g. electricity), and amount, if applicable and relevant	Not applicable
B3 REPAIR	
Repair process	Not applicable
Inspection process	Not applicable
Repair cycle	Not applicable
Ancillary materials (e.g. lubricant, specify materials)	Not applicable
Wastage material during repair (specify materials)	Not applicable
Net fresh water consumption	Not applicable
Energy input during repair (e.g. crane activity), energy carrier type (e.g. electricity), and amount	Not applicable
B4 REPLACEMENT	
Replacement cycle	Not applicable
Energy input during replacement (e.g. crane activity), energy carrier type (e.g. electricity), and amount, if applicable and relevant	Not applicable
Exchange of worn parts during the product's life cycle (e.g. zinc-galvanised steel sheet), specify materials	Not applicable
B5 REFURBISHMENT	
Refurbishment process	Not applicable
Refurbishment cycle	Not applicable
Energy input during refurbishment (e.g. crane activity), energy carrier type (e.g. electricity), and amount, if applicable and relevant	Not applicable
Material for refurbishment (e.g. bricks), including ancillary materials for the refurbishment process (e.g. lubricant, specify materials)	Not applicable
Wastage material during refurbishment (specify materials)	Not applicable
Further assumptions for scenario development (e.g. frequency and time of use, number of occupants)	Not applicable

Table 7. ***TECHNICAL INFORMATION. Energy use and water use***

Parameter	Result
Ancillary materials, specified by materials	Not applicable
Net fresh water consumption	Not applicable
Energy carrier type, e.g. electricity, natural gas, urban heating	Not applicable
Equipment output power	Not applicable
Characteristic performances (e.g. energy efficiency, emissions, variation in output with capacity utilisation)	Not applicable
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants)	Not applicable

END-OF-LIFE

Deconstruction and demolition (C1)

Once its useful life has ended, the product will be removed, either as part of a building renovation or during its demolition. In the context of a building demolition, the impacts attributable to the product's removal are negligible.

Transport (C2)

The product waste is transported by truck a distance of 50 km to its destination.

Waste processing for reuse, recovery, and/or recycling (C3)

The default end-of-life scenario for ceramic tile CPRs is applied, which considers that 70% of construction and demolition waste by weight is destined for recycling and reuse.

Disposal (C4)

30% of the product is sent to a controlled landfill, according to the default scenario of the CPR for ceramic coatings.

Table 8. ***TECHNICAL INFORMATION. End-of-life stage***

Parameter	Result
Collection process specified by type	27.1 kg/m^2 collected as construction and demolition waste, including both the product and the adhesive mortar.
Recovery system specified by type	20.9 kg/m^2 for recycling.
Disposal specified by type	6.2 kg/m^2 to a controlled landfill.
Assumptions for scenario development (e.g. transportation)	The product waste is transported by heavy-duty truck (24 t). A distance of 50 km is considered, both to the final disposal point and to the recycling plant. The return truck trip is also included (100% empty returns).

MODULE D: Benefits and loads beyond the system boundary from reuse, recovery, and/or recycling potentials

The environmental burdens and net benefits derived from recycling packaging waste (cardboard, plastic, and wood) generated at the facility and at the end of the product's life are considered.

ENVIRONMENTAL INFORMATION

Please note that EPDs from different programs are not directly comparable, as the assumptions, scope, and calculation rules may differ.

Comparisons of construction products must be made based on the same function, applying the same functional unit and at the building (or architectural or engineering work) level. That is, including the product's performance throughout its entire life cycle, as well as the specifications in section 6.7.2 of UNE-EN ISO 14025 and the European standard EN 15804+A2.

Environmental impact indicators

The following tables include the environmental data associated with the average life cycle of 1 m^2 of porcelain tiles installed on the interior floor of a home for 50 years. The impact values for the formats considered to have the lowest and highest environmental impact, included in the scope of this declaration, are presented in Annex I and Annex II.

The LCA was performed using the LCA for Experts (GABI v. 10) LCA software.

The modules not shown in the table are not environmentally relevant, according to the PCR for ceramic tiles (EN 17160).

Table 9. Parameters describing the environmental impacts of 1 m² of porcelain tiles (Bla) [average values]

		A1-A3	A4	A5	B2	C2	C3	C4	D
GWP-total	kg CO_2 eq	22.5	6.6E-01	3.3	1.9E-01	1.3E-01	2.4E-02	1.2E-01	-2.2E-01
GWP-fossil	kg CO_2 eq	23.8	6.5E-01	1.9	1.9E-01	1.3E-01	2.4E-02	1.2E-01	-2.2E-01
GWP-biogenic	kg CO_2 eq	-1.4	1.1E-04	1.5	4.4E-03	0	1.3E-05	1.3E-03	6.6E-06
GWP-luluc	kg CO_2 eq	7.0E-02	8.3E-03	3.9E-03	2.4E-05	2.0E-03	2.7E-06	5.3E-04	-4.7E-04
ODP	kg CFC11 eq	2.2E-08	8.3E-14	6.6E-10	6.5E-11	1.8E-14	5.3E-14	7.0E-14	-7.8E-09
AP	mol H+ eq	8.1E-02	4.0E-03	4.8E-03	6.0E-04	1.4E-04	2.7E-05	9.0E-04	-7.9E-04
EP-freshwater	kg P eq	1.1E-04	2.1E-06	7.0E-06	6.1E-06	5.1E-07	2.5E-09	2.6E-06	-2.7E-06
EP-marine	kg N eq	2.8E-02	1.0E-03	1.7E-03	1.4E-04	4.8E-05	7.6E-06	2.5E-04	-2.7E-04
EP-terrestrial	mol N eq	3.1E-01	1.1E-02	1.8E-02	1.4E-03	5.7E-04	8.2E-05	2.6E-03	-2.9E-03
POCP	kg NMVOC eq	8.4E-02	3.0E-03	4.9E-03	3.8E-04	1.6E-04	2.5E-05	7.2E-04	-7.2E-04
ADP-m&m	kg Sb eq	2.8E-05	4.6E-08	8.9E-07	3.2E-09	1.0E-08	1.0E-09	1.3E-08	-8.9E-08
ADP-fossil	MJ	331.3	7.8	16.3	3.2	1.6	5.6E-01	1.6	-3.4
WDP	m^3	4.6	7.9E-03	2.7E-01	21.7	1.9E-03	7.6E-03	9.3E-03	-1.7E-02

A1. Raw materials
A2. Transport
A3. Manufacturing
A4. Transport
A5. Installation

B1. Use
B2. Maintenance
B3. Repair
B4. Replacement
B5. Refurbishment
B6. Operational energy use
B7. Operational water use

C1. Deconstruction
C2. Transport
C3. Waste processing
C4. Disposal

D. Benefits and loads beyond the system boundary

Global warming potential (**GWP**); Stratospheric ozone depletion potential (**ODP**); Soil and water acidification potential (**AP**); Eutrophication potential (**EP**); Ground-level ozone formation potential (**POCP**); Abiotic resource depletion potential for minerals and metals (**ADP-m&m**); Abiotic resource depletion potential for fossil resources (**ADP-fossil**); Water deprivation potential (**WDP**).

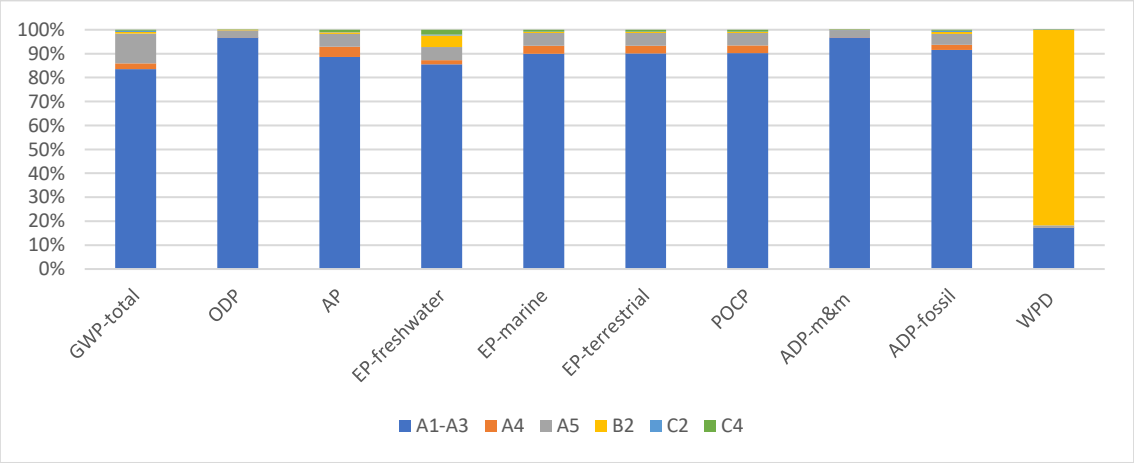

Figure 2 Environmental profile of 1 m² of porcelain tiles (Group Bla)

Indicators describing the resource use

The following table sets out the averaged data of the parameters describing resource use associated to life cycle of 1m^2 of porcelain tiles. The minimum and maximum values of the tiles included in this Environmental Product Declaration are detailed in the Annexes I and II.

The life cycle modules not shown in the table are considered irrelevant from an environmental point of view according to the PCR of ceramic tiles (EN 17160).

Table 10. ***Parameters describing the resource use of 1 m^2 of porcelain tiles (BIa) [average values]***

Parameter	Units	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw material	MJ (net)	52.29	0.57	2.21	4.20	0.00	0.14	0.03	0.19	-5.23
Use of renewable primary energy resources used as raw material	MJ (net)	13.44	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Total use of renewable primary energy resources	MJ (net)	65.73	0.57	2.61	4.20	0.00	0.14	0.03	0.19	-5.23
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material	MJ (net)	331.35	7.80	6.11	3.22	0.00	1.58	0.56	1.62	-3.42
Use of non-renewable primary energy resources used as raw materials	MJ (net)	1.17	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Total use of non-renewable primary energy resources	MJ (net)	332.52	7.80	6.14	3.22	0.00	1.58	0.56	1.62	-3.42
Use of secondary material	kg	3.77	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00
Use of renewable secondary fuels	MJ (net)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Use of non-renewable secondary fuels	MJ (net)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net use of fresh water	m^3	0.10	0.00	0.01	0.29	0.00	0.00	0.00	0.00	0.00

A1. Raw materials
A2. Transport
A3. Manufacturing
A4. Transport
A5. Installation

B1. Use
B2. Maintenance
B3. Repair
B4. Replacement
B5. Refurbishment
B6. Operational energy use
B7. Operational water use

C1. Deconstruction
C2. Transport
C3. Waste processing
C4. Disposal

D. Benefits and loads beyond the system boundary

Indicators describing the waste categories and output flows

The following tables set out the averaged data of the parameters describing waste production and output flows. The minimum and maximum values of the tiles included in this Environmental Product Declaration are detailed in the Annexes I and II.

The life cycle modules not shown in the table are considered irrelevant from an environmental point of view according to the PCR of ceramic tiles (EN 17160).

Table 11. Descriptive parameters of the waste category of 1 m^2 of porcelain tile (Bla) [average values]

Parameter	Units	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Hazardous waste	kg	5.46E-06	2.94E-10	1.67E-07	1.73E-10	0.00E+00	6.04E-11	8.01E-11	2.57E-08	-3.53E-08
Non-hazardous waste	kg	1.41	1.17E-03	4.57E-01	7.65E-02	0.00E+00	2.57E-04	8.68E-05	7.53	-9.89E-04
Radioactive waste	kg	1.16E-02	1.34E-05	5.73E-04	1.01E-05	0.00E+00	2.87E-06	8.14E-05	2.22E-05	-4.42E-05

A1. Raw materials
A2. Transport
A3. Manufacturing
A4. Transport
A5. Installation

B1. Use
B2. Maintenance
B3. Repair
B4. Replacement
B5. Refurbishment
B6. Operational energy use
B7. Operational water use

C1. Deconstruction
C2. Transport
C3. Waste processing
C4. Disposal

D. Benefits and loads beyond the system boundary

Table 12. Descriptive parameters for other output flows for 1 m^2 of porcelain tile (Bla) [average values]

Parameter	Units	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Components for reuse	kg	0	0	0	0	0	0	0	0	0
Materials for recycling	kg	1.6	0	1.5	0	0	0	19.8	0	0
Materials for energy valorisation (energy recovery)	kg	0	0	0	0	0	0	0	0	0
Exported energy	MJ	0	0	0	0	0	0	0	0	0

A1. Raw materials
A2. Transport
A3. Manufacturing
A4. Transport
A5. Installation

B1. Use
B2. Maintenance
B3. Repair
B4. Replacement
B5. Refurbishment
B6. Operational energy use
B7. Operational water use

C1. Deconstruction
C2. Transport
C3. Waste processing
C4. Disposal

D. Benefits and loads beyond the system boundary

ADDITIONAL ENVIRONMENTAL INFORMATION

Release of dangerous substances to soil and water during the use stage:

Indoor air emissions

In the ceramic tile manufacturing process, tiles are subjected to a thermal process above 1000ºC. At these temperatures, any organic compound in the compositions decomposes, yielding an inert end-product free of any volatile organic compounds that might be released in the use stage.

Release to soil and water

Ceramic tiles release no compounds into the soil or water during their use stage because it is a completely inert product that undergoes no physical, chemical, or biological transformations, is neither soluble nor combustible, and does not react physically or chemically or in any other way, is not biodegradable, and does not adversely affect other materials with which it enters into contact, thus not producing environmental pollution nor harming human health. It is a non-leaching product, so it does not endanger the quality of surface water or groundwater. For further information, please, request the manufacturer's safety data sheet.

Anexo I. Results for the format with lowest environmental impact

Environmental impact indicators

The following table sets out the data of the assessed impact indicators regarding the commercial size of porcelain tiles (BIa group) marketed by CERÁMICAS APARICI and included in this EPD with the lowest environmental impact: 30x30cm with 10mm thickness.

The modules not shown in the table are not environmentally relevant, according to the PCR for ceramic tiles (EN 17160).

Table 13. Parameters describing the environmental impacts of 1 m^2 of porcelain tiles (BIa) size 30x30 cm [values for the size with the lowest environmental impact]

		A1-A3	A4	A5	B2	C2	C3	C4	D
GWP-total	kg CO_2 eq	1.82E+01	7.17E-01	2.79E+00	1.92E-01	1.46E-01	2.66E-02	1.35E-01	-2.11E-01
GWP-fossil	kg CO_2 eq	1.92E+01	7.07E-01	1.73E+00	1.88E-01	1.43E-01	2.66E-02	1.33E-01	-2.10E-01
GWP-biogenic	kg CO_2 eq	-9.97E-01	1.15E-04	1.05E+00	4.34E-03	0.00E+00	1.40E-05	1.37E-03	5.88E-06
GWP-luluc	kg CO_2 eq	3.95E-02	9.18E-03	3.03E-03	2.34E-05	2.21E-03	2.93E-06	5.78E-04	-5.13E-04
ODP	kg CFC11 eq	1.98E-08	9.12E-14	5.96E-10	6.50E-11	1.93E-14	5.81E-14	7.65E-14	-8.54E-09
AP	mol H+ eq	5.61E-02	4.20E-03	4.08E-03	6.02E-04	1.53E-04	2.99E-05	9.86E-04	-6.84E-04
EP-freshwater	kg P eq	9.14E-05	2.36E-06	6.38E-06	6.05E-06	5.61E-07	2.70E-09	2.83E-06	-2.95E-06
EP-marine	kg N eq	1.76E-02	1.08E-03	1.37E-03	1.42E-04	5.27E-05	8.31E-06	2.72E-04	-2.76E-04
EP-terrestrial	mol N eq	1.93E-01	1.20E-02	1.49E-02	1.40E-03	6.26E-04	9.05E-05	2.89E-03	-2.93E-03
POCP	kg NMVOC eq	5.20E-02	3.17E-03	3.94E-03	3.74E-04	1.71E-04	2.70E-05	7.93E-04	-6.95E-04
ADP-m&m	kg Sb eq	2.45E-05	5.04E-08	7.69E-07	3.14E-09	1.14E-08	1.12E-09	1.37E-08	-9.55E-08
ADP-fossil	MJ	2.64E+02	8.53E+00	1.43E+01	3.21E+00	1.73E+00	6.14E-01	1.78E+00	-2.84E+00
WDP	m^3	3.92E+00	8.67E-03	2.45E-01	2.16E+01	1.46E-01	2.66E-02	1.35E-01	-2.11E-01

A1. Raw materials
A2. Transport
A3. Manufacturing
A4. Transport
A5. Installation

B1. Use
B2. Maintenance
B3. Repair
B4. Replacement
B5. Refurbishment
B6. Operational energy use
B7. Operational water use

C1. Deconstruction
C2. Transport
C3. Waste processing
C4. Disposal

D. Benefits and loads beyond the system boundary

Global warming potential (**GWP**); Stratospheric ozone depletion potential (**ODP**); Soil and water acidification potential (**AP**); Eutrophication potential (**EP**); Ground-level ozone formation potential (**POCP**); Abiotic resource depletion potential for minerals and metals (**ADP-m&m**); Abiotic resource depletion potential for fossil resources (**ADP-fossil**); Water deprivation potential (**WDP**).

Indicators describing the resource use

The following table includes data on the parameters that describe the use of resources associated with the life cycle of 1 m^2 of porcelain tiles format considered to have the lowest environmental impact and included in the scope of this declaration.

The modules not shown in the table are not environmentally relevant, according to the PCR for ceramic tiles (EN 17160).

Table 14. Results of the parameters relating to the use of resources of 1 m^2 of porcelain tiles (BIa) size 30x30 cm [values for the size with the lowest environmental impact]

Parameter	Units	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw material	MJ (net)	4.92E+01	6.26E-01	2.20E+00	4.19E+00	0.00E+00	1.49E-01	3.05E-02	2.08E-01	-4.88E+00
Use of renewable primary energy resources used as raw material	MJ (net)	1.15E+01	0.00E+00	3.45E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ (net)	6.06E+01	6.26E-01	2.55E+00	4.19E+00	0.00E+00	1.49E-01	3.05E-02	2.08E-01	-4.88E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material	MJ (net)	2.64E+02	8.53E+00	6.11E+00	3.21E+00	0.00E+00	1.73E+00	6.14E-01	1.78E+00	-2.84E+00
Use of non-renewable primary energy resources used as raw materials	MJ (net)	5.08E-01	0.00E+00	1.52E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ (net)	2.65E+02	8.53E+00	6.12E+00	3.21E+00	0.00E+00	1.73E+00	6.14E-01	1.78E+00	-2.84E+00
Use of secondary material	kg	3.83E+00	0.00E+00	1.15E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ (net)	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-renewable secondary fuels	MJ (net)	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
Net use of fresh water	m^3	8.41E-02	6.98E-04	5.18E-03	2.86E-01	0.00E+00	1.66E-04	1.10E-04	3.39E-04	-2.10E-03

A1. Raw materials
A2. Transport
A3. Manufacturing
A4. Transport
A5. Installation

B1. Use
B2. Maintenance
B3. Repair
B4. Replacement
B5. Refurbishment
B6. Operational energy use
B7. Operational water use

C1. Deconstruction
C2. Transport
C3. Waste processing
C4. Disposal

D. Benefits and loads beyond the system boundary

Indicators describing the waste categories and output flows.

The following table includes the average data for the parameters that describe the generation of waste and output flows of 1 m^2 of porcelain tiles format considered to have the lowest environmental impact and included in the scope of this declaration.

The modules not shown in the table are not environmentally relevant, according to the PCR for ceramic tiles (EN 17160).

Table 15. Descriptive parameters of the waste category of 1 m^2 of porcelain tiles (BIa) size 30x30 cm [values for the size with the lowest environmental impact]

Parameter	Units	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Hazardous waste	kg	5.46E-06	3.22E-10	1.68E-07	1.72E-10	0.00E+00	6.62E-11	8.79E-11	2.82E-08	-3.88E-08
Non-hazardous waste	kg	1.20E+00	1.28E-03	4.66E-01	7.63E-02	0.00E+00	2.82E-04	9.52E-05	8.26E+00	-1.10E-03
Radioactive waste	kg	8.95E-03	1.47E-05	4.93E-04	1.01E-05	0.00E+00	3.15E-06	8.94E-05	2.43E-05	-5.80E-05

A1. Raw materials
A2. Transport
A3. Manufacturing
A4. Transport
A5. Installation

B1. Use
B2. Maintenance
B3. Repair
B4. Replacement
B5. Refurbishment
B6. Operational energy use
B7. Operational water use

C1. Deconstruction
C2. Transport
C3. Waste processing
C4. Disposal

D. Benefits and loads beyond the system boundary

Table 16. Descriptive parameters of other output flows of 1 m^2 of porcelain tiles (BIa) size 30x30 cm [values for the size with the lowest environmental impact]

Parameter	Units	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Components for reuse	kg	0	0	0	0	0	0	0	0	0
Materials for recycling	kg	0.02	0	1.4	0	0	0	20.1	0	0
Materials for energy valorisation (energy recovery)	kg	0	0	0	0	0	0	0	0	0
Exported energy	MJ	0	0	0	0	0	0	0	0	0

A1. Raw materials
A2. Transport
A3. Manufacturing
A4. Transport
A5. Installation

B1. Use
B2. Maintenance
B3. Repair
B4. Replacement
B5. Refurbishment
B6. Operational energy use
B7. Operational water use

C1. Deconstruction
C2. Transport
C3. Waste processing
C4. Disposal

D. Benefits and loads beyond the system boundary

Annex II. Results for the format with highest environmental impact

Environmental impact indicators

The following table sets out the data of the assessed impact indicators regarding the commercial size of porcelain tiles (BIa group) marketed by CERÁMICAS APARICI and included in this EPD with the highest environmental impact: 60x120cm with 11.8mm thickness.

The modules not shown in the table are not environmentally relevant, according to the PCR for ceramic tiles (EN 17160).

Table 17. Parameters describing the environmental impacts of 1 m^2 of porcelain tiles (BIa) size 60x120 cm [values for the size with the highest environmental impact]

Parameter	Units	A1-A3	A4	A5	B2	C2	C3	C4	D
GWP-total	kg CO_2 eq	4.32E+01	6.77E-01	3.99E+00	1.93E-01	1.30E-01	2.38E-02	1.20E-01	-2.42E-01
GWP-fossil	kg CO_2 eq	4.43E+01	6.69E-01	2.51E+00	1.88E-01	1.28E-01	2.38E-02	1.19E-01	-2.42E-01
GWP-biogenic	kg CO_2 eq	-1.35E+00	1.20E-04	1.47E+00	4.36E-03	0.00E+00	1.26E-05	1.23E-03	-2.92E-05
GWP-luluc	kg CO_2 eq	1.79E-01	8.50E-03	7.18E-03	2.35E-05	1.97E-03	2.62E-06	5.17E-04	-4.59E-04
ODP	kg CFC11 eq	2.65E-08	8.58E-14	7.98E-10	6.53E-11	1.73E-14	5.20E-14	6.84E-14	-6.10E-09
AP	mol H+ eq	1.75E-01	4.34E-03	7.65E-03	6.05E-04	1.37E-04	2.68E-05	8.82E-04	-9.57E-04
EP-freshwater	kg P eq	1.57E-04	2.19E-06	8.75E-06	6.07E-06	5.02E-07	2.42E-09	2.53E-06	-2.23E-06
EP-marine	kg N eq	6.79E-02	1.11E-03	2.89E-03	1.42E-04	4.72E-05	7.44E-06	2.43E-04	-2.79E-04
EP-terrestrial	mol N eq	7.47E-01	1.23E-02	3.16E-02	1.41E-03	5.60E-04	8.10E-05	2.59E-03	-2.99E-03
POCP	kg NMVOC eq	2.00E-01	3.25E-03	8.40E-03	3.76E-04	1.53E-04	2.42E-05	7.10E-04	-7.65E-04
ADP-m&m	kg Sb eq	3.91E-05	4.70E-08	1.21E-06	3.15E-09	1.02E-08	1.00E-09	1.23E-08	-9.03E-08
ADP-fossil	MJ	6.22E+02	8.06E+00	2.50E+01	3.22E+00	1.55E+00	5.50E-01	1.59E+00	-4.37E+00
WDP	m^3	7.83E+00	8.05E-03	3.65E-01	2.17E+01	1.82E-03	7.50E-03	9.12E-03	-3.14E-02

A1. Raw materials
A2. Transport
A3. Manufacturing
A4. Transport
A5. Installation

B1. Use
B2. Maintenance
B3. Repair
B4. Replacement
B5. Refurbishment
B6. Operational energy use
B7. Operational water use

C1. Deconstruction
C2. Transport
C3. Waste processing
C4. Disposal

D. Benefits and loads beyond the system boundary

Global warming potential (**GWP**); Stratospheric ozone depletion potential (**ODP**); Soil and water acidification potential (**AP**); Eutrophication potential (**EP**); Ground-level ozone formation potential (**POCP**); Abiotic resource depletion potential for minerals and metals (**ADP-m&m**); Abiotic resource depletion potential for fossil resources (**ADP-fossil**); Water deprivation potential (**WDP**).

Indicators describing the resource use

The following table includes data on the parameters that describe the use of resources associated with the life cycle of 1 m^2 of porcelain tiles format considered to have the highest environmental impact and included in the scope of this declaration.

The modules not shown in the table are not environmentally relevant, according to the PCR for ceramic tiles (EN 17160).

Table 18. Results of the parameters relating to the use of resources of 1 m^2 of porcelain tiles (BIa) size 60x120 cm [values for the size with the highest environmental impact]

Parameter	Units	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw material	MJ (net)	6.93E+01	5.81E-01	2.21E+00	4.20E+00	0.00E+00	1.33E-01	2.73E-02	1.86E-01	-5.94E+00
Use of renewable primary energy resources used as raw material	MJ (net)	1.75E+01	0.00E+00	5.25E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ (net)	8.67E+01	5.81E-01	2.73E+00	4.20E+00	0.00E+00	1.33E-01	2.73E-02	1.86E-01	-5.94E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material	MJ (net)	6.22E+02	8.06E+00	6.12E+00	3.22E+00	0.00E+00	1.55E+00	5.50E-01	1.59E+00	-4.37E+00
Use of non-renewable primary energy resources used as raw materials	MJ (net)	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 primary energy resources	MJ (net)	6.22E+02	8.06E+00	6.12E+00	3.22E+00	0.00E+00	1.55E+00	5.50E-01	1.59E+00	-4.37E+00
Use of secondary material	kg	4.80E+00	0.00E+00	1.44E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ (net)	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-renewable secondary fuels	MJ (net)	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
Net use of fresh water	m^3	1.68E-01	6.48E-04	7.75E-03	2.87E-01	0.00E+00	1.49E-04	9.83E-05	3.03E-04	-2.69E-03

A1. Raw materials
A2. Transport
A3. Manufacturing
A4. Transport
A5. Installation

B1. Use
B2. Maintenance
B3. Repair
B4. Replacement
B5. Refurbishment
B6. Operational energy use
B7. Operational water use

C1. Deconstruction
C2. Transport
C3. Waste processing
C4. Disposal

D. Benefits and loads beyond the system boundary

Indicators describing the waste categories and output flows.

The following table includes the average data for the parameters that describe the generation of waste and output flows of 1 m^2 of porcelain tiles format considered to have the highest environmental impact and included in the scope of this declaration.

The modules not shown in the table are not environmentally relevant, according to the PCR for ceramic tiles (EN 17160).

Table 19. Descriptive parameters of the waste category of 1 m^2 of porcelain tiles (BIa) size 60x120 cm [values for the size with the highest environmental impact]

Parameter	Units	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Hazardous waste	kg	5.47E-06	3.04E-10	1.68E-07	1.73E-10	0.00E+00	5.93E-11	7.87E-11	2.52E-08	-3.47E-08
Non-hazardous waste	kg	2.42E+00	1.20E-03	4.93E-01	7.66E-02	0.00E+00	2.53E-04	8.53E-05	7.39E+00	-1.05E-03
Radioactive waste	kg	2.28E-02	1.38E-05	9.10E-04	1.01E-05	0.00E+00	2.82E-06	8.00E-05	2.18E-05	-1.96E-05

A1. Raw materials
A2. Transport
A3. Manufacturing
A4. Transport
A5. Installation

B1. Use
B2. Maintenance
B3. Repair
B4. Replacement
B5. Refurbishment
B6. Operational energy use
B7. Operational water use

C1. Deconstruction
C2. Transport
C3. Waste processing
C4. Disposal

D. Benefits and loads beyond the system boundary

Table 20. Descriptive parameters of other output flows of 1 m^2 of porcelain tiles (BIa) size 60x120 cm [values for the size with the highest environmental impact]

Parameter	Units	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Components for reuse	kg	0	0	0	0	0	0	0	0	0
Materials for recycling	kg	6.5	0	1.9	0	0	0	24.4	0	0
Materials for energy valorisation (energy recovery)	kg	0	0	0	0	0	0	0	0	0
Exported energy	MJ	0	0	0	0	0	0	0	0	0

A1. Raw materials
A2. Transport
A3. Manufacturing
A4. Transport
A5. Installation

B1. Use
B2. Maintenance
B3. Repair
B4. Replacement
B5. Refurbishment
B6. Operational energy use
B7. Operational water use

C1. Deconstruction
C2. Transport
C3. Waste processing
C4. Disposal

D. Benefits and loads beyond the system boundary