

SALONI



# ENVIRONMENTAL PRODUCT DECLARATION

Ceramic tiles. Glazed Stoneware tiles [B11a classification according to EN 14411: 2016]



THE INTERNATIONAL EPD® SYSTEM

Application standards: EN 15804:2012+A1:2013 ISO 14025:2013

Registration number The International EPD® System: S-P-01156  
Based on PCR 2012:01 Construction products and construction services and SUB-PCR Bricks, blocks, tiles, flagstone of clay and siliceous earths [construction product]

UN CPC 37370

Scope of the EPD®: International

Date of publication: **2018/03/02**

Date of verification: 2018/10/23

Valid until: **2023/03/01**



# 1. GENERAL INFORMATION.

## Manufacturer and owner of the declaration:

CERÁMICA SALONI, S.A.

Ctra. Alcora, km. 17, 12130 San Juan de Moró, Castellón [España].

**With the technical support of:** Instituto de Tecnología Cerámica – [ITC-AICE]. Campus Universitario Riu Sec, Av. Vicent Sos Baynat s/n. 12006, Castellón, [Spain]

Further information regarding the project report of the LCA study for ceramic tiles manufactured by CERÁMICA SALONI, S.A. might be requested. To access this data, please contact the manufacturer:

[www.saloni.com](http://www.saloni.com), [saloni@saloni.com](mailto:saloni@saloni.com).

## Programme reference data:

**Programme used:** The International EPD® System. For more information see [www.environdec.com](http://www.environdec.com)

**EPD® registration number/declaration number:** S-P-01156

**PCR identification:** EN 15804 as the core PCR 2012:01 Construction products and construction services. Version 2.2. and SUB-PCR Bricks, blocks, tiles, flagstone of clay and siliceous earths (construction product).

**Product category under the UN CPC code:** UN CPC 37370.

**Declaration issued: 2018/03/02**      **Valid until: 2023/03/01**

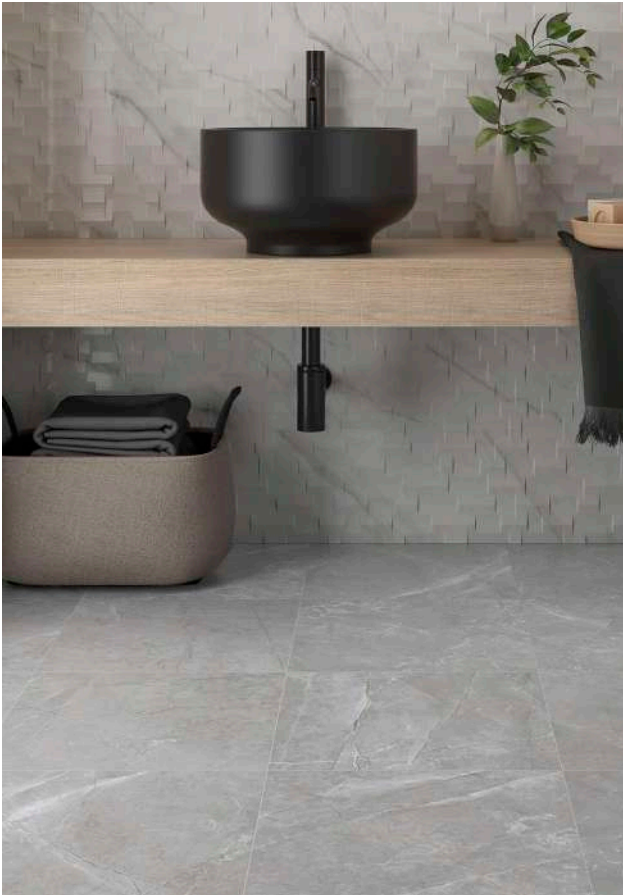
Comparison of construction products shall be based on the same function, using the same functional unit at building level [or architectural or civil engineering works], i.e. including the performance of the product during the life cycle and the requirements stated in EN ISO 14025, 6.7.2EN ISO 14025.

"EPDs of construction products may not be comparable if they do not comply with EN 15804".

"EPD within the same product category from different programs may not be comparable" as the assumptions, scope and calculation rules might be different.

### CEN standard EN 15804 served as the core PCR

<b>PCR:</b>	PCR 2012:01 Construction products and construction services. Version 2.2. SUB-PCR-D Bricks, blocks, tiles, flagstone of clay and siliceous earths (construction product)
<b>PCR review was conducted by:</b>	The Technical Committee on the International EPD® System. Chair Massimo Marino. Contact via <a href="mailto:info@environdec.com">info@environdec.com</a>
<b>Independent verification of the declaration and data, according to ISO 14025:2</b>	<input type="checkbox"/> EPD process certification. <input checked="" type="checkbox"/> EPD verification.
<b>Third party verifier:</b>	Marcel Gómez Ferrer. Marcel Gómez Consultoria Ambiental ( <a href="http://www.marcelgomez.com">www.marcelgomez.com</a> ) Telf. +34 630 64 35 93. <a href="mailto:info@marcelgomez.com">info@marcelgomez.com</a>
<b>Accredited or approved by:</b>	The International EPD® System.



## 2.PRODUCT.

### Identification of the product.

This EPD® describes the environmental information based on a life cycle assessment of a group of tiles from a single manufacturer, CERÁMICA SALONI, S.A., considering the geographical and technical coverage of Spain during 2016.

The ceramic tiles included in the study belong to the B1a water absorption group, according to UNE-EN 14411:2013 (equivalent to ISO 13006:2012); i.e. they have a water absorption between 3% and 6% [Glazed Stoneware tiles].

The Glazed Stoneware tiles included in this study comprises different models with different sizes. Specifically, the product sizes considered within the scope of the study are between 8.5 mm and 9.5 mm thick.

### Product components.

None of the end-product components are included in the Candidate List of substances of very high concern for authorisation.

#### BODY RAW MATERIALS

*clay and defloculants.*

95%

#### GLAZE RAW MATERIALS

*feldspars, carbonates, quartz, borates, silicates, kaolins, zirconium oxides, clays, alumina, and zinc oxide*

5%

## Application of the product.

The intended use of the product is surface covering. In this study the environmental performance for indoor flooring in homes has been assessed. However, the versatility of the ceramic tile also allows the installation in different environments such as offices, shops, hospitals, etc., both indoor and outdoor, and also for such as wall or other surfaces as cladding. For further information, please request the manufacturer's technical data sheet on the model involved.



### TECHNICAL DATA

Technical specification	Reference Test method	Porcelain Stoneware tiles
Water absorption	ISO 10545-3	3%<Eb≤6%
Breaking load	ISO 10545-4	Minimum 22 N/mm <sup>2</sup> Individual minimum. 20 N/mm <sup>2</sup>
Resistance to chemical attack	ISO 10545-13	For low and high concentrations of acids and alkalis: declared value For resistance to household chemicals and swimming pool salt: minimum class B
Resistance to stains	ISO 10545-14	Minimum class 3
Anti-slip properties	DIN 51130	Request for the manufacturer's technical sheet according to the model.
Resistance to deep abrasion	ISO 10545-6	-
Resistance to surface abrasion	ISO 10545-7	Request for the manufacturer's technical sheet according to the model.
Impact resistance	ISO 10545-5	Complies
Frost resistance	ISO 10545-12	-

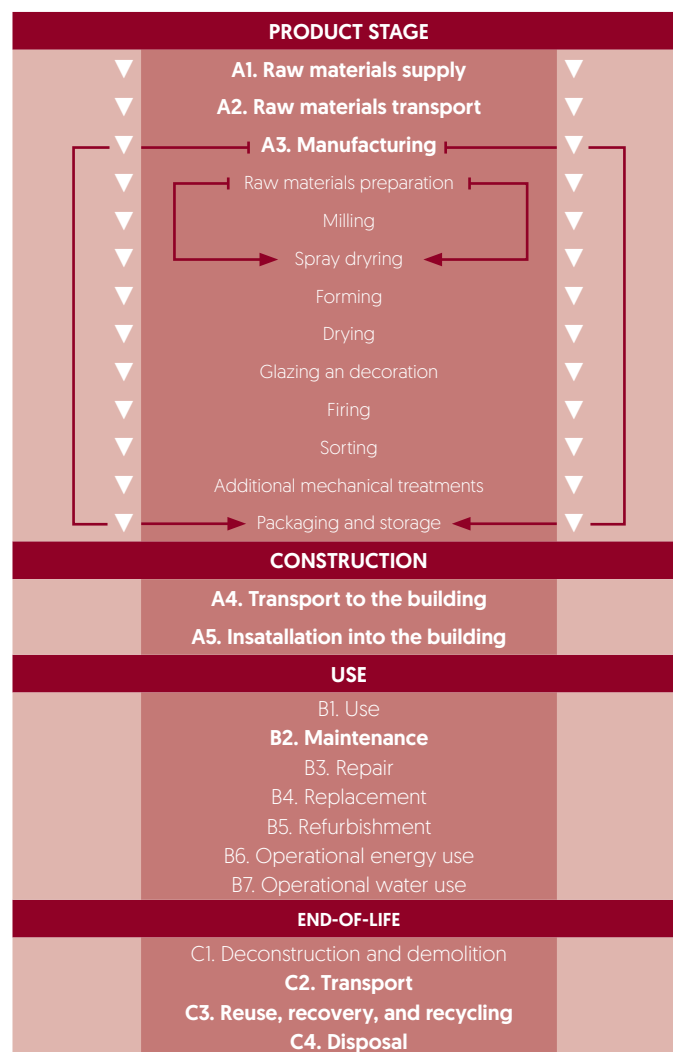
# 3. LIFE CYCLE ASSESSMENT CONSIDERATIONS

## Functional Unit.

The Functional Unit is "1 m<sup>2</sup> covering of a [floor] surface inside a home for 50 years with Glazed Stoneware tiles (water absorption group B1a)".

## System boundaries. Information modules.

This LCA is "cradle-to-grave"; i.e. it includes the product, construction/installation, use and end of life stages.



The life cycle modules considered are:

**Product stage:** Raw materials supply [A1]; Transport [A2]; and Manufacturing [A3]

**Construction process stage:** Transport [from the gate of the factory to the construction site] [A4]; and Installation and construction processes [A5]

**Use stage:** Maintenance [B2]

**End of life stage:** Transport to waste processing [C2]; Waste processing for reuse, recovery and/or recycling [C3]; and Disposal [C4]

Modules B1, B3-7, C1 and D are not taken into account, are not applicable or not declared

## Life cycle description.

### Product Stage (Modules A1, A2 and A3).

#### Raw materials supply and transport (A1 and A2).

The basic materials for these tiles are mainly clay and a thin layer of decorative materials.

These decorative materials are manufactured in specialized companies, where, part of the raw materials are subjected to a fritting process (fusion of raw materials and quenching) obtaining insoluble glasses. The frits, pigments and the rest of the raw materials are mixed and packed. The most common decorative raw materials are quartz, kaolin, alkaline feldspars, calcium carbonate, borates, zircon, clay, calcined alumina, ceramic frits, pigments, and additives such as suspending agents, deflocculants, or binders.

All body raw materials are extracted in Spain and are transported by trucks to the Saloni factory. The decorative raw materials with origin outside Spain are transported to the Castellon harbour by ship and then by truck to the factory. For maritime transports, transoceanic cargo freighters was chosen; the distance used is based on the point of origin. All raw materials are transported in bulk, i.e. with no packing, except some decorative materials.

#### Manufacturing (A3).

The raw materials are prepared in the SALONI manufacturing plant. The different clays that make up the support are mixed and subjected to a grind with a wet process and then, dried to obtain a spray-dried granule.

This spray-drier includes a system of cogeneration for combined heat and electric power. All the heated gases generated are used in the atomization process; part of the electric energy generated is used in the manufacturing process itself, thus reducing the energy demand from the grid and other part is sold to the grid, considering therefore, a co-product.

The spray-dried granules, once manufactured, are transported in bulk in 27 t trucks to the SALONI factory. In the factory, the spray-dried powder is stored in storage hoppers. Using a feed system of conveyor belts with weight control, the granules are conveyed to the forming stage.

The tiles are then formed by dry uniaxial pressing. The formed pieces are introduced into a continuous dryer to reduce tile moisture content, thus doubling or tripling tile mechanical strength for subsequent processing, thus allowing the next processing.

Once the tiles are removed from the dryer they are decorated with one or more thin layers of ceramic glaze, then the glaze is applied on the body with different techniques such as bell glazing and airbrushes. Subsequently, the body is decorated with applying different techniques, being the majority, the injection of inks and to a lesser extent, the dry decoration in the pressing stage and rotogravure.

The firing is the most important stage in the production process, as the materials have a fundamental change in the properties, obtaining a hard material, resistant to water and to chemical products. The products are fired in single-channel roller kilns.

After the quality control processes, also known as sorting, the pieces are packaged using cardboard, pallets, and polyethylene. Once the pallet is prepared is stored in the logistic area of the factory.

### Construction Process.

#### Transport to the construction site (A4).

Product distribution is as follows:



For road transport, a 27t truck, EURO V class, was considered. For transcontinental transport, an average transoceanic freighter was considered. All models used are included in the database GaBi version 8.006.

#### Construction/ installation (A5).

The product is then duly unpacked for installation. Data show that, in a real scenario, the tiles need to be installed with fast-setting mortars. Fast-setting mortars are cementitious adhesives that consist of a mixture of hydraulic binders, mineral fillers, and organic additives, which only need to be mixed with water or a liquid addition just before use. These mortars consist of a mixture of grey or white cement, mineral fillers of a siliceous and/ or limestone nature, and organic additives: water retainers, water-redispersible polymers, rheological modifiers,

fibres, etc. Waste from packaging waste is handled separately depending on the geographic location of the installation site. It has been considered a 3% (in mass) wastage of the product during the installation.

**Use Stage.**

Once installed, the tile requires no energy input for use nor require any maintenance after installation, except normal cleaning operations. Consequently, of all the modules mentioned previously, only the environmental loads relating to product maintenance are considered [Module B2].

According to CERÁMICA SALONI, S.A., the reference service life [RSL] of the product is the same as that of the building where it is installed because, provided it is properly installed, it is a durable product that will not require replacement. A RSL of 50 years has been considered.

**Maintenance [B2].**

Cleaning is performed with a moist cloth and, if the surface exhibits any dirt or grease, cleaning agents such as detergents or bleaches can be added. In the study it has been considered water and disinfectant consumption in a residential use scenario: that is a cleaning once a week.

**End of Life.****Deconstrucción and demolition [C1].**

When its service life has ended, the product will be removed, either as part of building refurbishment or building demolition. In building demolition, the impacts assignable to product disassembly are negligible.

**Transport [C2].**

Product wastes are transported in a truck according to Euro VI standards, over a distance of 50 km to the destination. In order to estimate the 50 km between the demolished building and the nearest controlled landfill, only the Spanish market was considered, and the results were extrapolated to the entire ceramic market.

**Waste processing [C3]**

According to the Royal Decree 105/2008 and the Waste Framework Directive, as well as to the European Union agreements, 70% of the construction and demolition waste is assumed to go to reuse, recovery, and recycling.

**Disposal [C4].**

Thirty% of the product is sent to a controlled landfill.

# 4. RESULTS OF THE LIFE CYCLE ASSESSMENT (LCA)

## Environmental parameters.

The LCA was developed with the life cycle assessment software GaBi 8.10.29 and with the data base version 8.006 (Thinkstep). The characterization factors used are the factors included within EN 15804:2012+A1:2013.

This EPD® includes the range of Glazed Stoneware Tiles of thickness between 8.5 mm and 9.5 mm. The differences in the mandatory impact indicators are lower than ±10% [concerning A1-A3]. The results presented set out the environmental performance of the reference product Glazed Stoneware Tiles of 8.5 mm thickness.

Table 1. Parameters describing environmental impacts.

PARAMETER	UNIT	LIFE CYCLE STAGES										
		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE				END OF USE		BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY	
		BEYOND THE SYSTEM	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
Global warming potential	Kg. CO <sub>2</sub> eq.	11.0	6.3E-01	1.3	N.R.	1.5E-01	N.R.	N.R.	1.7E-01	0	1.1E-01	M.N.D.
Ozone depletion potential	Kg. CFC 11 eq.	7.6E-08	2.1E-13	2.3E-09	N.R.	4.1E-08	N.R.	N.R.	5.6E-14	0	1.1E-13	M.N.D.
Acidification potential of soil and water	Kg. SO <sub>2</sub> eq.	2.4E-02	1.1E-03	2.2E-03	N.R.	5.2E-04	N.R.	N.R.	1.3E-04	0	6.3E-04	M.N.D.
Eutrophication potential	Kg. (PO <sub>4</sub> <sup>3-</sup> ) eq.	3.0E-03	2.7E-04	3.3E-04	N.R.	1.5E-04	N.R.	N.R.	3.1E-05	0	8.6E-05	M.N.D.
Photochemical ozone formation potential	Kg. Ethene eq.	1.8E-03	1.3E-04	2.3E-04	N.R.	1.5E-04	N.R.	N.R.	1.9E-06	0	5.2E-05	M.N.D.
Abiotic depletion potential for non-fossil resources	Kg Sb eq.	9.7E-06	5.1E-08	1.6E-06	N.R.	1.3E-07	N.R.	N.R.	1.3E-08	0	3.8E-08	M.N.D.
Abiotic depletion potential for fossil resources	MJ (Net calorific value)	165.0	8.7	9.9	N.R.	8.3E-01	N.R.	N.R.	2.3	0	1.4	M.N.D.
A1. Raw materials A2. Transport A3. Production A4. Transport A5. Construction/installation process		B1. Use B2. Maintenance B3. Repair B4. Replacement B5. Refurbishment B6. Operational use of energy B7. Operational use of water				C1. Deconstruction C2. Transport C3. Waste processing C4. Disposal						N.R.: Not Relevant M.N.D.: modules no declared



Table 2. Parameters describing the use of resources

PARAMETER	UNIT	LIFE CYCLE STAGES										
		PRODUCT STAGE	CONSTRUCTION STAGE			USE STAGE				END OF USE		BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
		BEYOND THE SYSTEM	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ. net calorific value	19,6	4.4E-01	1,6	N.R.	1,6	N.R.	N.R.	1.2E-01	0	1.7E-01	M.N.D.
Use of renewable primary energy resources used as raw materials	MJ. net calorific value	0	0	0	N.R.	0	N.R.	N.R.	0	0	0	M.N.D.
Total use of renewable primary energy resources (primary energy and primary energy)	MJ. net calorific value	19,6	4.4E-01	1,6	N.R.	1,6	N.R.	N.R.	1.2E-01	0	1.7E-01	M.N.D.
Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials	MJ. net calorific value	174,8	8,7	10,7	N.R.	9.1E-01	N.R.	N.R.	2,3	0	1,4	M.N.D.
Use of non renewable primary energy resources used as raw materials	MJ. net calorific value	0	0	0	N.R.	0	N.R.	N.R.	0	0	0	M.N.D.
Total use of non renewable primary energy resources	MJ. net calorific value	174,8	8,7	10,7	N.R.	9.1E-01	N.R.	N.R.	2,3	0	1,4	M.N.D.
Use of secondary material	kg	0	0	0	N.R.	0	N.R.	N.R.	0	0	0	M.N.D.
Use of renewable secondary fuels	MJ. net calorific value	0	0	0	N.R.	0	N.R.	N.R.	0	0	0	M.N.D.
Use of non renewable secondary fuels	MJ. net calorific value	0	0	0	N.R.	0	N.R.	N.R.	0	0	0	M.N.D.
Net use of fresh water	m³	5,3	3.7E-02	5.6E-01	N.R.	2.4E-01	N.R.	N.R.	9.8E-03	0	8.0E-02	M.N.D.
A1. Raw materials A2. Transport A3. Production A4. Transport A5. Construction/installation process		B1. Use B2. Maintenance B3. Repair B4. Replacement B5. Refurbishment B6. Operational use of energy B7. Operational use of water				C1. Deconstruction C2. Transport C3. Waste processing C4. Disposal						N.R.: Not Relevant M.N.D.: modules no declared

Table 3. Parameters describing waste categories for glazed stoneware tiles.

PARAMETER	UNIT	LIFE CYCLE STAGE										
		PRODUCT STAGE	CONSTRUCTION STAGE			USE				END OF USE		BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
		A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
Hazardous waste disposed	Kg	6.0E-03	0	1.8E-04	N.R.	1.5E-05	N.R.	N.R.	0	0	0	M.N.D.
Non hazardous waste disposed	Kg	17,8	3.1E-02	2,4	N.R.	1.4E-01	N.R.	N.R.	8.3E-03	0	13,5	M.N.D.
Radioactive waste disposed	Kg	2.5E-03	1.2E-05	3.0E-04	N.R.	1.3E-05	N.R.	N.R.	3.1E-06	0	2.0E-05	M.N.D.
A1. Raw materials A2. Transport A3. Production A4. Transport A5. Construction/installation process		B1. Use B2. Maintenance B3. Repair B4. Replacement B5. Refurbishment B6. Operational use of energy B7. Operational use of water				C1. Deconstruction C2. Transport C3. Waste processing C4. Disposal						N.R.: Not Relevant M.N.D.: modules no declared

Table 4 Parameters describing other output flows

PARAMETER	UNIT	LIFE CYCLE STAGE										
		PRODUCT STAGE	CONSTRUCTION STAGE			USE				END OF USE		BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
		A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
Components for re-use	Kg	0	0	0	N.R.	0	N.R.	N.R.	0	0	0	M.N.D.
Materials for recycling	Kg	1.8E-02	0	6.5E-01	N.R.	0	N.R.	N.R.	0	15.4	0	M.N.D.
Materials for energy recovery	Kg	0	0	2.5E-02	N.R.	0	N.R.	N.R.	0	0	0	M.N.D.
Exported energy	MJ per energy carrier	0	0	0	N.R.	0	N.R.	N.R.	0	0	0	M.N.D.
A1. Raw materials		B1. Use			C1. Deconstruction				N.R.: Not Relevant			
A2. Transport		B2. Maintenance			C2. Transport				M.N.D.: modules no declared			
A3. Production		B3. Repair			C3. Waste processing							
A4. Transport		B4. Replacement B5. Refurbishment			C4. Disposal							
A5. Construction/installation process		B6. Operational use of energy										
		B7. Operational use of water										

# 5. SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION.

Module: A4—A5: Construction process stage.

## Module A4: Transport to the building site.

Table 5. TECHNICAL INFORMATION. Construction process stage. Transport to the building site.

TECHNICAL INFORMATION. Construction process stage. Transport to the building site	
PARAMETER	RESULT (EXPRESSED PER FUNCTIONAL UNIT)
Fuel type and consumption	0.19 l diesel oil (27 t truck Euro V) 0.0006 l fuel oil (freighter)
Distance	500km national: 30% 2000 km rest of Europe: 29% 10.000 km rest of the world: 41%
Capacity utilisation (including empty returns)	85% in trucks 100% freighter
Bulk density of the transported products	415,4 kg/m <sup>3</sup>
Volume capacity utilisation factor (factor: = 1 or < 1 or ≥ 1 for compressed or nested packaged products)	0,15

## Module A5: Installation in the building.

Table 6. TECHNICAL INFORMATION. Construction process stage. Installation in the building.

TECHNICAL INFORMATION. Construction process stage. Installation in the building	
PARAMETER	RESULT (EXPRESSED PER FUNCTIONAL UNIT)
Auxiliary materials for the installation	
Material 1: Cementitious adhesive	3,5 kg
Use of fresh water	0,00088 m <sup>3</sup>
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)	Wastage of the product: 0.57 kg Packaging waste: Cardboard: 0.16 kg Plastics: 0.02 kg Wood: 0.33 kg
Output materials (specified by type) as a result of waste processing at the construction site	Incineration of cardboard: 0.012 kg Recycled cardboard: 0.095 kg Landfill disposal of cardboard: 0.034 kg Incineration of plastics: 0.0031 kg Recycled plastics: 0.0157 kg Landfill disposal of plastics: 0.0078 kg Incineration of wood: 0.058 kg Recycled wood: 0.443 kg Landfill disposal of wood: 0.163 kg
Direct emissions to ambient air, soil and water	Not applicable

## Module: B1-B7: Use stage.

### Use stage related to the building.

Table 7. TECHNICAL INFORMATION. Use stage related to the building.

TECHNICAL INFORMATION. Use stage related to the building.	
PARAMETER	RESULT (EXPRESSED PER FUNCTIONAL UNIT)
<b>B2 MAINTENANCE</b>	
Maintenance process	Washing once a week (residential use)
Maintenance cycle	Not applicable
Ancillary materials for maintenance (e.g. cleaning agent) (specify materials)	Detergent: 0.05 kg/life
Wastage material during maintenance (specify materials)	Not applicable
Net fresh water consumption	0.26 m <sup>3</sup> /life
Energy input during maintenance (e.g. vacuum cleaning), energy carrier type (e.g. electricity) and amount, if applicable and relevant	Not applicable
<b>B3 REPAIR</b>	
Reparation process	Not applicable
Inspection process	Not applicable
Reparation cycle	Not applicable
Ancillary materials (e.g.: lubricant, specify materials)	Not applicable
Wastage material during reparation (specify materials)	Not applicable
Net fresh water consumption	Not applicable
Energy input during reparation (e.g. use of cranes), energy carrier type (e.g. electricity) and amount	Not applicable
<b>B4 REPLACEMENT</b>	
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
<b>B5 REFURBISHMENT</b>	
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 period of use, number of occupants)	Not applicable

## Reference service life.

**Table 8. TECHNICAL INFORMATION. Reference service life.**

TECHNICAL INFORMATION. Reference service life	
PARAMETER	RESULT (EXPRESSED PER FUNCTIONAL UNIT)
Reference service life	Minimum 50 years
Declared product properties (at the gate) and finishes, etc.	Minimum values of the relevant characteristics according to standard EN 14411 annex I. For more information, request for the manufacturer's technical sheet according to the model.
Design application parameters (manufacturer's instructions), including the references to appropriate practices	For more information, request for the manufacturer's technical sheet according to the model.
Assumed quality of work, when installed in accordance with the manufacturer's instructions	Request the manufacturer for installation recommendations
Outdoor environment (for outdoor applications), e.g. weathering, pollutants, UV radiation and wind exposure, building orientation, shading, temperature	Results of the values of the relevant characteristics according to the EN 14411 standard annex I. For more information, request for the manufacturer's technical sheet according to the model.
Indoor environment (indoor applications), e.g. temperature, moisture, chemical exposure	Results of the values of the relevant characteristics according to the EN 14411 standard annex I. Information included in the manufacturer's technical data sheet, for each model
Usage conditions, e.g. frequency of use, mechanical exposure	Information included in the manufacturer's technical data sheet, for each model
Maintenance, e.g. required frequency, type and quality and replacement of replaceable components	Request the manufacturer for maintenance recommendations

## B6 Energy use and B7 Water Use

**Table 9. TECHNICAL INFORMATION. Energy use and water use.**

TECHNICAL INFORMATION. Energy use and water use	
PARAMETER	RESULT (EXPRESSED PER FUNCTIONAL UNIT)
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

**Module C1-C4: End of life stage.**

*Table 10. TECHNICAL INFORMATION. End of life stage*

TECHNICAL INFORMATION. End of life stage	
PARAMETER	RESULT (EXPRESSED PER FUNCTIONAL UNIT)
Collection process specified by type	0 kg collected separately
	19.4 kg collected with mixed construction waste
Recovery system specified by type	0 kg for reuse
	13.6 kg for recycling
	Energy valorisation not applicable
Disposal specified by type	7.7 kg to a controlled landfill
Assumptions for scenario development (e.g. transportation)	The product waste is transported in a large-tonnage truck (24 t) that meets Euro 6 standard. A distance of 50 km is assumed both to the final disposal site and to the recycling plant. A truck return trip (100% empty returns) is also included.

## 6. ADDITIONAL ENVIRONMENTAL INFORMATION:

### Environmental system management of CERÁMICA SALONI, S.A.

The CERÁMICA SALONI S.A. environmental management system was certified according to ISO 14001 in 2012. The certification establishes the requirements for implementing, developing and maintaining the management system and the commitment to control the environmental impacts of its production process, with a focus on continuous improvement of the system.

CERÁMICA SALONI S.A., is a member of ECOEMBALAJES ESPAÑA S.A., (ECOEMBES), and participates in a Packaging and Packaging Waste Prevention Business Plan.

### Indoor air emissions.

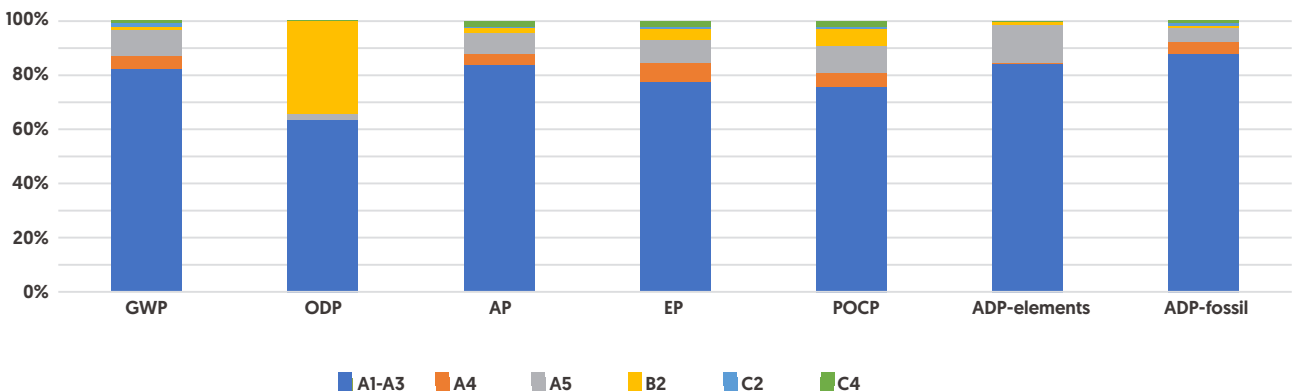
In the ceramic tile manufacturing process, tiles are subjected to a thermal process above 1000 °C. At these temperatures, any organic compound in the compositions decomposes, yielding an inert end-product free of any volatile organic compounds that might be released in the use stage.

### Release to soil and water.

Ceramic tiles release no compounds into the soil or water during their use stage because a completely inert product is involved 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 such that it might produce environmental pollution or harm human health. It is a non-leaching product, so that it does not endanger the quality of surface water or groundwater.

## 7. LCA INTERPRETATION.

- The differences in environmental impacts associated to the glazed stoneware tiles included within the thickness range of 8.5 mm and 9.5 mm are lower than 10%.
- The product stage [A1-A3] is module of the life cycle with the greatest environmental impacts, mainly due to the intensive consumption of thermal energy.
- Operations associated with the maintenance stage [B2] were defined according to a residential scenario. Changing the frequency of cleaning operations implies proportional changes in these impacts at that stage.



Contribution of each life cycle module to each environmental impact category

AP: Acidification Potential; ODP: Ozone layer Depletion Potential; ADP-fossil: Abiotic Depletion Potential-fossil resources; ADP-elements: Abiotic Depletion Potential-non fossil resources; GWP: Global Warming Potential; EP: Eutrophication Potential; POCP: Photochemical Ozone Creation Potential

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## **9. MODIFICATIONS INTRODUCED COMPARED WITH THE PREVIOUS VERSION OF THE EPD®.**

During the combustion of gasoil NO and NO<sub>2</sub> are emitted, being NO very unstable in the atmosphere and transformed to NO<sub>2</sub> in a very short period of time. As a consequence, NO emitted during the combustion of gasoil has been assimilated to NO<sub>2</sub>.