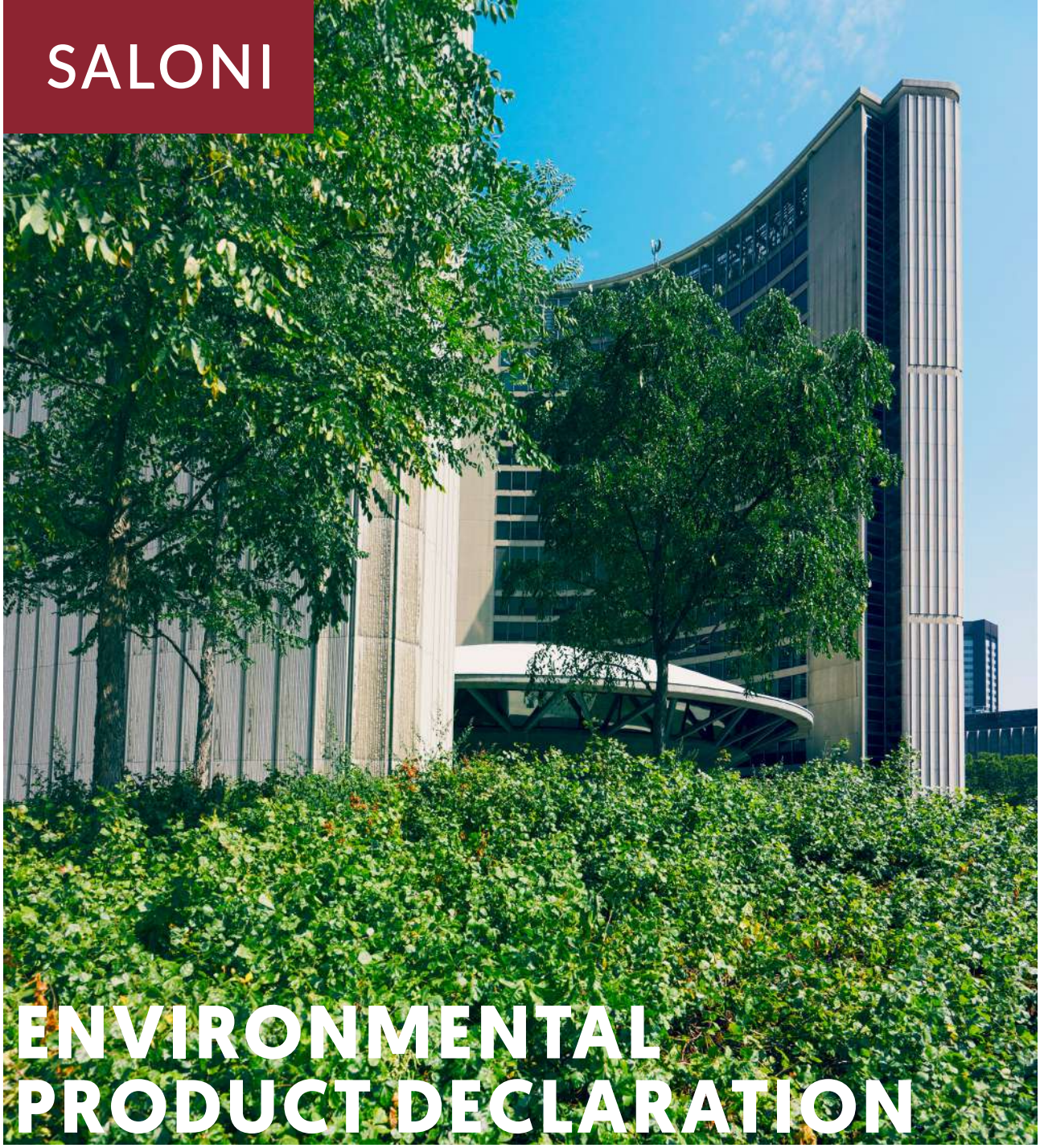
SALONI



ENVIRONMENTAL PRODUCT DECLARATION

Ceramic tiles. Earthenware tiles (BIII classification according to EN 14411: 2016)

EPD®

THE INTERNATIONAL EPD® SYSTEM

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

Registration number The International EPD® System: S-P-01157
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, saloni@saloni.com.

Programme reference data:

Programme used: The International EPD® System. For more information see 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	
PCR:	PCR 2012:01Construction products and construction services. Version 2.2. SUB-PCR-D Bricks, blocks, tiles, flagstone of clay and siliceous earths (construction product)
PCR review was conducted by:	The Technical Committee on the International EPD ® System. Chair Massimo Marino. Contact via info@environdec.com
Independent verification of the declaration and data, according to ISO 14025:2	□ EPD process certification. x EPD verification.
Third party verifier:	Marcel Gómez Ferrer. Marcel Gómez Consultoria Ambiental (www.marcelgomez.com) Telf. +34 630 64 35 93. info@marcelgomez.com
Accredited or approved by:	The International EPD® System.

2.PRODUCT.

Identification of the product.

This environmental product declaration describes the environmental information based on a life cycle assessment of ceramic tiles manufactured by CERÁMICA SALONI, S.A considering the geographical and technical coverage of Spain during 2016.

The ceramic tiles included in the study belong to the BIII water absorption group according to UNE-EN 14411:2013 (equivalent to ISO 13006:2012); i.e. they have a water absorption > 10% (earthenware tiles).

The earthenware tiles included in this study comprises different models with different sizes. Specifically, the product sizes considered within the scope of the study are between 8.3 mm and 12.5 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

94%

clay, carbonates and defloculants.

GLAZE RAW MATERIALS

6%

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

Application of the product.

The intended use of the product is surface covering. This study evaluates the environmental performance of the use stage of the Earthenware Tile as wall covering inside a home for 50 years; however, the versatility of the ceramic also allows this type of tile to be used for other purposes, e.g. in offices, shops, and hospitals. For further information, please request the manufacturer's technical data sheet on the model involved.

TECHNICAL DATA

Technical specification	Reference Test method	Earthenware tiles
Water absorption	ISO 10545-3	E_b>10%
Breaking load	ISO 10545-4	Thickness ≥7,5 mm, minimum 12 N/mm²
		Thickness <7,5 mm, minimum 15 N/mm²
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	-
Resistance to deep abrasion	ISO 10545-6	-
Resistance to surface abrasion	ISO 10545-7	-
Impact resistance	ISO 10545-5	-
Frost resistance	ISO 10545-12	

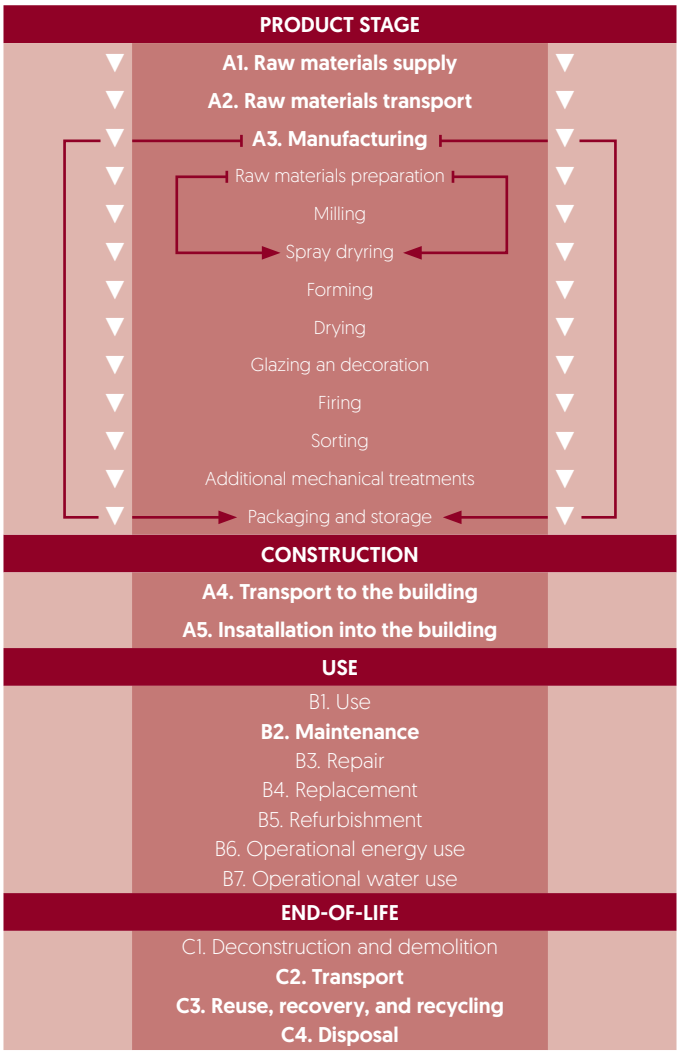
3.LIFE CYCLE ASSESSMENT CONSIDERATIONS.

Functional Unit

The Functional Unit is "1 m2 covering of a (wall) surface inside a home for 50 years with Earthenware Tiles (Water absorption group BIII)".

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)

Modues 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 (white and red), carbonates and a thin layer of decorative materials.
The latter 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 main raw materials of these decorative materials are mainly composed by quartz, kaolin, alkaline feldspars, calcium carbonate, borates, zircon, clay, calcined alumina, ceramic frits, pigments, and additives such as suspending agents, defloculants, or binders
The raw materials used have different origins, in accordance with their nature and properties. Red clays are extracted in Spain and white clays are extracted in Spain and Ukraine.
The arriving raw materials that are transported by freighter reach the port of Castellón and are hauled from there by truck to the manufacturing facilities. For sea transportation, a transoceanic type of freighter was chosen; the distance travelled differing in each case, depending on the origin. The raw materials are all transported in bulk, i.e. they require no packaging material, except some decorative materials.

Manufacturing (A3)

The preparation of raw materials is carried out, partly in the SALONI plant and partly in specialised external companies.
The different clays that make up the support are mixed and then subjected to a wet
The spray-driers include cogeneration systems 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 drier 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 drier 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 building 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.

Installation into the building (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 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 reference service life 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 twice a year.

End of life.

Deconstruction 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 for reuse, recovery and/or recycling (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.

Final disposal (C4)

The 30 % of the product is sent to a controlled landfill.

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

Environmental parameters.

The Life cycle assessment was developed with the life cycle assessment software GaBi 8.1.0.29 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 earthenware tiles of thickness between 8.3 mm and 12.5 mm.

The differences obtained in the results of the impact assessment of each of the sizes included in the scope of this EPD® are higher than 10% (concerning A1-A3) and therefore, in order to comply with the applicable PCR grouping criteria, three groups have been configured. Thus, the results presented establish the environmental performance of three reference products: 8.3 mm thick earthenware tiles, representing tiles of the same thickness; earthenware tiles of 9.5 thickness, representing the group of tiles whose thickness is between 9.5 mm and 10.5 mm and the third group, 12.5 mm thick earthenware representing the tiles with 12-12.5 mm thick.

Table 1. Parameters describing environmental impacts of Earthenware tiles of 8.3 mm thickness

		LIFE CYCLE STAGES										
		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE				END OF USE			BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
PARAMETER	UNIT	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
Global warming potential	Kg. CO_2 eq.	12,4	3,0E-01	6,0E-01	N.R.	2,7E-03	N.R.	N.R.	7,3E-02	0	4,6E-02	M.N.D.
Ozone depletion potential	Kg. CFC 11 eq.	8,5E-08	1,0E-13	2,6E-09	N.R.	7,5E-10	N.R.	N.R.	2,4E-14	0	4,7E-14	M.N.D.
Acidification potential of soil and water	Kg. SO_2 eq.	2,4E-02	5.3E-04	1,0E-03	N.R.	9,5E-06	N.R.	N.R.	5.7E-05	0	6.3E-04	M.N.D.
Eutrophication potential	Kg. (PO_4^{3-}) eq.	3,0E-03	1,3E-04	1,5E-04	N.R.	2,7E-06	N.R.	N.R.	1,3E-05	0	8,6E-05	M.N.D.
Photochemical ozone formation potential	Kg. Ethene eq.	1,8E-03	6.1E-04	9.4E-05	N.R.	2,8E-06	N.R.	N.R.	8.3E-07	0	5.2E-05	M.N.D.
Abiotic depletion potential for non-fossil resources	Kg Sb eq.	1,1E-05	2,4E-08	6,0E-07	N.R.	2,4E-09	N.R.	N.R.	5,7E-09	0	1,7E-08	M.N.D.
Abiotic depletion potential for fossil resources	MJ (Net calorific value)	143,5	4,1	5,4	N.R.	1,5E-02	N.R.	N.R.	9,9E-01	0	6,0E-01	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 environmental impacts of Earthenware tiles of 9.5 mm thickness

		LIFE CYCLE STAGES										
		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE				END OF USE			BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
PARAMETER	UNIT	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
Global warming potential	Kg. CO_2 eq.	14,0	3,5E-01	6,9E-01	N.R.	3,2E-03	N.R.	N.R.	8,5E-02	0	5,4E-02	M.N.D.
Ozone depletion potential	Kg. CFC 11 eq.	8,6E-08	1,2E-13	2,6E-09	N.R.	8,8E-10	N.R.	N.R.	2,8E-14	0	5,5E-14	M.N.D.
Acidification potential of soil and water	Kg. SO_2 eq.	2,5E-02	6.2E-04	1,1E-03	N.R.	1,1E-05	N.R.	N.R.	6.7E-05	0	3,2E-04	M.N.D.
Eutrophication potential	Kg. (PO_4^{3-}) eq.	3,1E-03	1,5E-04	1,6E-04	N.R.	3,2E-06	N.R.	N.R.	1,6E-05	0	4,3E-05	M.N.D.
Photochemical ozone formation potential	Kg. Ethene eq.	1,9E-03	7.1E-05	1.0E-04	N.R.	3,3E-06	N.R.	N.R.	9.7E-06	0	2,6E-05	M.N.D.
Abiotic depletion potential for non-fossil resources	Kg Sb eq.	1,2E-05	2,8E-08	6,5E-07	N.R.	2,8E-09	N.R.	N.R.	6,7E-09	0	1,9E-08	M.N.D.
Abiotic depletion potential for fossil resources	MJ (Net calorific value)	160,7	4,8	6,1	N.R.	1,8E-02	N.R.	N.R.	1,2	0	7,0E-01	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 environmental impacts of Earthenware tiles of 12.5 mm thickness.

		LIFE CYCLE STAGES										
		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE				END OF USE			BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
PARAMETER	UNIT	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
Global warming potential	Kg. CO_2 eq.	17,6	4,3E-01	8,6E-01	N.R.	4,0E-03	N.R.	N.R.	1,1E-01	0	6,7E-02	M.N.D.
Ozone depletion potential	Kg. CFC 11 eq.	8,6E-08	1,5E-13	2,6E-09	N.R.	1,1E-09	N.R.	N.R.	3,5E-14	0	6,8E-14	M.N.D.
Acidification potential of soil and water	Kg. SO_2 eq.	2,8E-02	7.7E-03	1,3E-03	N.R.	1,4E-05	N.R.	N.R.	8.3E-05	0	4,0E-04	M.N.D.
Eutrophication potential	Kg. (PO_4^{3-}) eq.	3,6E-03	1.8E-04	1.9E-04	N.R.	4,0E-06	N.R.	N.R.	2,0E-05	0	5,4E-05	M.N.D.
Photochemical ozone formation potential	Kg. Ethene eq.	2,2E-03	8.8E-05	1.2E-04	N.R.	4,1E-06	N.R.	N.R.	1.2E-05	0	3,3E-05	M.N.D.
Abiotic depletion potential for non-fossil resources	Kg Sb eq.	1,2E-05	3,5E-08	7,5E-07	N.R.	3,5E-09	N.R.	N.R.	8,4E-09	0	2,4E-08	M.N.D.
Abiotic depletion potential for fossil resources	MJ (Net calorific value)	201,4	6,0	7,7	N.R.	2,2E-02	N.R.	N.R.	1,4	0	8,7E-01	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 the use of resources of Earthenware tiles of 8.3 mm thickness

		LIFE CYCLE STAGES										
		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE				END OF USE			BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
PARAMETER	UNIT	A1-A3	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	18,3	2,1E-01	7,7E-01	N.R.	3,0E-02	N.R.	N.R.	5,0E-02	0	7,2E-02	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	18,3	2,1E-01	7,7E-01	N.R.	3,0E-02	N.R.	N.R.	5,0E-02	0	7,2E-02	M.N.D.
Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials	MJ. net calorific value	153,5	4,2	5,8	N.R.	1,7E-02	N.R.	N.R.	1,0	0	6,2E-01	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	153,5	4,2	5,8	N.R.	1,7E-02	N.R.	N.R.	1,0	0	6,2E-01	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	6,5	1,8E-02	2,8E-01	N.R.	4,4E-03	N.R.	N.R.	4,2E-03	0	3,4E-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 5. Parameters describing the use of resources of Earthenware tiles of 9.5 mm thickness

		LIFE CYCLE STAGES										
		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE				END OF USE			BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
PARAMETER	UNIT	A1-A3	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	19,4	2,4E-01	8,4E-01	N.R.	3,5E-02	N.R.	N.R.	5,8E-02	0	8,4E-02	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	19,4	2,4E-01	8,4E-01	N.R.	3,5E-02	N.R.	N.R.	5,8E-02	0	8,4E-02	M.N.D.
Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials	MJ. net calorific value	171,2	4,9	6,6	N.R.	2,0E-02	N.R.	N.R.	1,2	0	7,2E-01	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	171,2	4,9	6,6	N.R.	2,0E-02	N.R.	N.R.	1,2	0	7,2E-01	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	6,8	2,1E-02	3,0E-01	N.R.	5,2E-03	N.R.	N.R.	5,0E-03	0	4,0E-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 6. Parameters describing the use of resources of Earthenware tiles of 12.5 mm thickness.

		LIFE CYCLE STAGES										
		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE				END OF USE			BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
PARAMETER	UNIT	A1-A3	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	25,6	3,0E-01	1,1	N.R.	4,4E-02	N.R.	N.R.	7,2E-02	0	1,0E-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	25,6	3,0E-01	1,1	N.R.	4,4E-02	N.R.	N.R.	7,2E-02	0	1,0E-01	M.N.D.
Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials	MJ. net calorific value	214,7	6,0	8,3	N.R.	2,4E-02	N.R.	N.R.	1,4	0	9,0E-01	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	214,7	6,0	8,3	N.R.	2,4E-02	N.R.	N.R.	1,4	0	9,0E-01	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	7,6	2,6E-02	3,5E-01	N.R.	6,4E-03	N.R.	N.R.	6,2E-03	0	5,0E-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 7 Parameters describing waste categories of Earthenware tiles of 8.3 mm thickness

		LIFE CYCLE STAGES										
		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE				END OF USE			BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
PARAMETER	UNIT	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
Hazardous waste disposed	Kg	4,2E-03	0	1,2E-04	N.R.	2,7E-07	N.R.	N.R.	0	0	0	M.N.D.
Non hazardous waste disposed	Kg	17,1	1,5E-02	1,0E+00	N.R.	2,5E-03	N.R.	N.R.	3,6E-03	0	5,8	M.N.D.
Radioactive waste disposed	Kg	2,5E-03	5,7E-06	1,2E-04	N.R.	2,4E-07	N.R.	N.R.	1,4E-06	0	8,4E-06	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 8. Parameters describing waste categories of earthenware tiles of 9,5 mm thickness.

		LIFE CYCLE STAGES										
		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE				END OF USE			BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
PARAMETER	UNIT	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
Hazardous waste disposed	Kg	4,7E-03	0	1,4E-04	N.R.	3,1E-07	N.R.	N.R.	0	0	0	M.N.D.
Non hazardous waste disposed	Kg	20,0	1,8E-02	1,2	N.R.	2,9E-03	N.R.	N.R.	4,2E-03	0	6,8	M.N.D.
Radioactive waste disposed	Kg	2,6E-03	6,6E-06	1,3E-04	N.R.	2,8E-07	N.R.	N.R.	1,6E-06	0	9,9E-06	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 9. Parameters describing waste categories of earthenware tiles of 12,5 mm thickness.

		LIFE CYCLE STAGES										
		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE				END OF USE			BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
PARAMETER	UNIT	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
Hazardous waste disposed	Kg	5,7E-03	0	1,7E-04	N.R.	3,9E-07	N.R.	N.R.	0	0	0	M.N.D.
Non hazardous waste disposed	Kg	26,1	2,2E-02	1,5	N.R.	3,6E-03	N.R.	N.R.	5,2E-03	0	8,5	M.N.D.
Radioactive waste disposed	Kg	4,0E-03	8,2E-06	1,8E-04	N.R.	3,5E-07	N.R.	N.R.	2,0E-06	0	1,2E-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 10. Parameters describing other output flows of Earthenware tiles of 8.3 mm thickness.

		LIFE CYCLE STAGES										
		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE				END OF USE			BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
PARAMETER	UNIT	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
Hazardous waste disposed	Kg	0	0	0	N.R.	0	N.R.	N.R.	0	0	0	M.N.D.
Non hazardous waste disposed	Kg	8,8E-03	0	2,9E-01	N.R.	0	N.R.	N.R.	0	6,7	0	M.N.D.
Radioactive waste disposed	Kg	0	0	1,2E-02	N.R.	0	N.R.	N.R.	0	0	0	M.N.D.
Hazardous waste disposed	MJ per energy carrier	0	0	0	N.R.	0	N.R.	N.R.	0	0	0	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 11. Parameters describing other output flows of Earthenware tiles of 9.5 mm thickness.

		LIFE CYCLE STAGES										
		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE				END OF USE			BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
PARAMETER	UNIT	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	7,8	0	M.N.D.
Materials for recycling	Kg	1,0E-02	0	3,4E-01	N.R.	0	N.R.	N.R.	0	0	0	M.N.D.
Materials for energy recovery	Kg	0	0	1,4E-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
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 12. Parameters describing other output flows of Earthenware tiles of 12.5 mm thickness.

		LIFE CYCLE STAGES										
		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE				END OF USE			BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
PARAMETER	UNIT	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	1,3E-02	0	4,2E-01	N.R.	0	N.R.	N.R.	0	9,7	0	M.N.D.
Materials for energy recovery	Kg	0	0	1,7E-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
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

5.SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION.

Module: A4—A5: Construction process stage.

Module A4: Transport to the building site.

Table 13. 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	0.11 l diesel oil (27 t truck Euro V) 0.0003 l fuel oil (freighter)
Distance	500km national distribution: 30% 2000 km rest of Europe distribution: 29% 10.000 km rest of the world distribution: 41%
Capacity utilisation (including empty returns)	85% en trucks 100% freighter
Bulk density of the transported products	415,4 kg/m³
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 14. 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	1,5 kg
Use of fresh water	0,00038 m³
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: 0.16 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.

Tabla 15. TECHNICAL INFORMATION. Use stage related to the building.

TECHNICAL INFORMATION. Use stage related to the building.	
PARAMETER	**RESULT (EXPRESSED PER FUNCTIONAL UNIT)**
B2 MAINTENANCE	
Maintenance process	Washing twice a year (residential use)
Maintenance cycle	Not applicable
Ancillary materials for maintenance (e.g. cleaning agent) (specify materials)	Detergent: 0.002 kg/life
Wastage material during maintenance (specify materials)	Not applicable
Net fresh water consumption	0.1 m3/life
Energy input during maintenance (e.g. vacuum cleaning), energy carrier type (e.g. electricity) and amount, if applicable and relevant	Not applicable
B3 REPAIR	
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
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 period of use, number of occupants)	Not applicable

Reference service life.

Table 16. 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 K 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 K 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 K 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 17. 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 18. 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
	19.5 kg collected with mixed construction waste
Recovery system specified by type	0 kg for reuse
	13.7 kg for recycling
	Energy valorization Not applicable
Disposal specified by type	5.9 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 CERAMICA 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.
The development of an active environmental policy over and above the legal requirements has allowed CERÁMICA SALONI S.A., to manufacture products with high recycled content and to communicate this achievement through a Self-declared environmental claim (type II environmental labelling) according to ISO 14021. Moreover, 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.

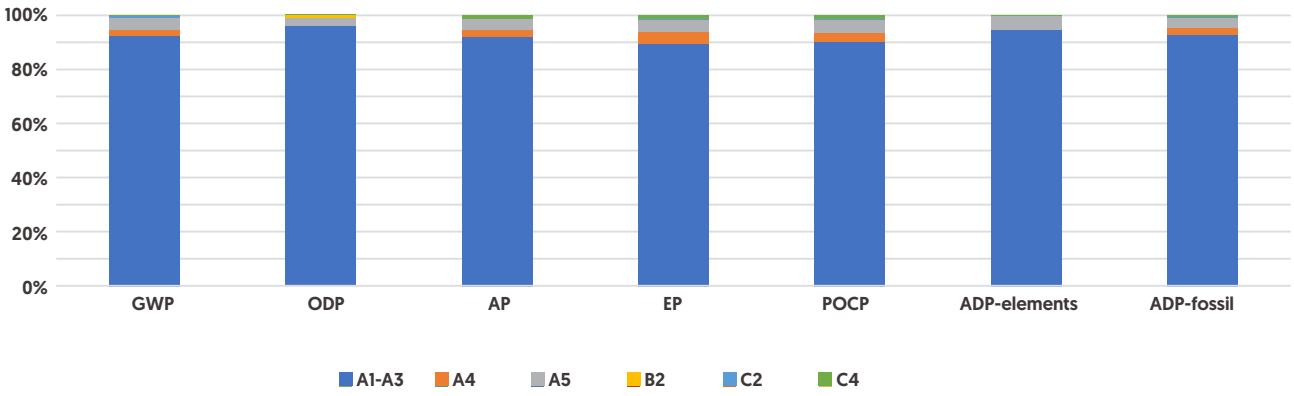
In the ceramic tile manufacturing process, tiles are subjected to a thermal process above 1000 °C. At these temperatures, any organic compound in the compositions decomposes, yielding an inert end-product free of any volatile organic compounds that might be released in the use stage.

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 porcelain stoneware tiles included within the thickness range of 8.3 mm and 12.5 mm are higher than 10%. However, the relative contribution of each module to the whole life cycle are similar.
- 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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- ELCD v.3.2. Developed by European Plattform of LCA. More information: http://lca.jrc.ec.europa.eu

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

During the combustion of gasoil NO and NO_2 are emitted, being NO very unstable in the atmosphere and transformed to NO_2 in a very short period of time. As a consequence, NO emitted during the combustion of gasoil has been assimilated to NO_2.