

Environmental Product Declaration

In accordance with:
ISO 14025

EN 15804:2012+A2:2019 for:



PORCELAIN STONEWARE TILES

(Bla classification based on EN 14411:2016)

of GRES DE ARAGÓN, S.A.

GRES ARAGÓN

SOLUTIONS FOR LIVING



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1. Programme information

Programme:	The International EPD [®] System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
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CEN standard EN 15804:2012+A2:2019 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2019:14 Construction products, version 1.1 C-PCR-002 Ceramic tiles (EN 17160:2019), version 2019-12-20
PCR review was conducted by: The Technical Committee of the International EPD [®] System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat. www.environdec.com/contact .
Independent third-party verification of the declaration and data, according to ISO 14025:2006: <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Third party verifier: Accredited by: International EPD [®] System Marcel Gómez Ferrer Marcel Gómez Consultoría Ambiental (www.marcelgomez.com) Tlf 0034 630 64 35 93 Email: info@marcelgomez.com Approved by: The International EPD [®] System
Procedure for follow-up of data during EPD validity involves third party verifier: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804:2012+A2:2019. For further information about comparability, see EN 15804:2012+A2:2019 and ISO 14025.

2. Company information

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Description of the organisation

Gres de Aragón, is a stoneware manufacturing company with two main product branches:

- Vertically extruded stoneware tiles and fired in a tunnel kiln.
- Horizontally extruded porcelain stoneware tiles and pressed porcelain stoneware tiles, both fired in a roller kiln.

In both types of product, the bases and a whole kit of complements (corners, skirting boards, stairs, handrails, pool coping, overflow edges, ceramic gratings, corner pieces, etc.) are manufactured.

GRES ARAGÓN provides sustainable, quality, innovative and healthy architectural ceramic solutions, in collaboration with customers and specifiers, creating stable employment and high added value.

It offers ceramic products for: exterior and interior paving and cladding; covering the skin of buildings; cladding, crowning and surrounding swimming pools; and equipping facilities with special hygiene and safety requirements.

Certification

Gres de Aragón, S.A. has obtained the following certifications:

-ISO 9001: Quality Management System Registration number: ES10/7810

- ISO 14001: Environmental Management System Registration number ES10/7812

Name and location of production sites

For the production of the porcelain stoneware tiles included in this EPD, the following facilities are considered:

<p>GRES DE ARAGÓN, S.A. Ctra. Escatrón, 9 44600 Alcañiz, Teruel (España)</p>

3. Product information

Product name

Porcelain stoneware tiles.

UN CPC code

373 Refractory products and structural nonrefractory clay products

Product identification

The 15 ceramic sizes included in this EPD covers the ceramic tiles pertaining group Bla (porcelain stoneware tiles), classification based on EN 14411:2016 (equivalent to ISO13006:2018), this is their water absorption is less than 0.5% and its forming is by pressing.

The porcelain stoneware tiles included in the study cover different models with different formats. The thickness formats included in the scope of this EPD are from 8mm (18.5kg/m²) a 14mm (28.3kg/m²), with an average weight of 20.6kg/m².

Product technical features

The function of the product is to cover surfaces. In this study the environmental behaviour of the porcelain stoneware tiles as indoor house surface covering has been assessed, however, the versatility of these pieces allows them to be installed in other places, such as offices, stores, hospitals, etc, in indoor and outdoor environments, as well as covering walls and other surfaces.

The product meets requirements defined by the EN 14411:2016 standard and ISO 13006 Annex G. Hereafter, a table with principal properties is presented.

Description	Test	Standards	Results	
			Not rectified	Rectified
Sizes			±0.6 % Max. ±2 mm	± 1 mm
Length and width	EN-ISO 10545-2	±0.6 % Max. ±2 mm		
Thickness		± 5% max ± 0.5 mm	variable 8 to 14 ± 0.5 mm	
Straightness of sides		± 0.5% max ± 1.5 mm	Largely complies with the standard	
Rectangularity		± 0.5% max ± 2 mm		
Lateral curvature		± 0.5% max ± 2 mm		
Warpage		± 0.5% max ± 2 mm		

Description	Test	Standards	Results	
			Not rectified	Rectified
Sizes				
Reaction to fire	EN 13501-1	Required	A1 No react	
Water absorption	EN-ISO 10545-3	$E \leq 0.5\%$	$\leq 0.5\%$	
Modulus of rupture	EN-ISO 10545-4	$\geq 35 \text{ N/mm}^2$	$\geq 40 \text{ N/mm}^2$	
Breaking strength	EN-ISO 10545-4	$\geq 1300 \text{ N}$	e=8 mm $\geq 1500 \text{ N}$ e=10 mm $\geq 2000 \text{ N}$ e=14 mm $\geq 4000 \text{ N}$	
Resistance to surface abrasion	EN-ISO 10545-7	Min <i>PEI II</i>	From 2 to 5	
Linear thermal expansion	EN-ISO 10545-8	Not required	5.8×10^{-6}	
Resistance to thermal shock	EN-ISO 10545-9	Required	Guaranteed	
Moisture expansion	EN-ISO 10545-10	Not required	$< 0.1 \text{ mm/m}$	
Crazing resistance	EN-ISO 10545-11	Required	Guaranteed	
Frost resistance	EN-ISO 10545-12	Required	Guaranteed	
Chemical resistance	EN-ISO 10545-13	Min B	HA/LA	
Resistance to stains	EN-ISO 10545-14	Min Class 3	Class 5	
Slip resistance (pendulum)	UNE 41901:2017 EX	Depending on location	Gloss Class 0	
			Smooth Class 1	
			Anti-slip Class 3	
Barefoot slip resistance	DIN 51097	Not required	Gloss	
			Smooth B	
			Anti-slip C	
Slip resistance footwear	DIN 51130	Not required	Gloss < R9	
			Smooth <R9	
			Anti-slip R11	
Dynamic coefficient of friction	ANSI A137.1	Not required	Smooth <0.42	
			Anti-slip 0.70	
Antibacterial	JIS Z-2801 (ISO 22196)	Not required	R> 2 Reduction >99%	

4. LCA information

Unidad funcional

To cover 1 m² of a surface (indoor and outdoor flooring, swimming pools) for 50 years with porcelain stoneware tiles (20.6 kg/m² of weight).

Reference service life

The Reference Service Life (RSL) of the product is the same as that of the building where it is installed provided that it is installed correctly, as it is a durable product which does not require substitution. A Reference Service Life of 50 years has been considered.

Parameter	Result (expressed per functional unit)
Reference Service Life	Minimum 50 years
Declared product properties (on gate), coatings, etc.	Minimum values of the relevant characteristics according to Annex G of the EN 14411 standard. For more information request technical data sheets according to model.
Design parameters of the application (manufacturer's instructions), including references to good practices.	For more information request technical data sheets according to model.
Estimated quality of work, when installed according to the manufacturer's specifications	For more information request technical data sheets according to model.
Estimation of the quality of work, when installed from outside environment (for outdoor applications), e.g. weathering, pollutants, UV radiation and wind exposure, building orientation, shading, temperature, etc.	Minimum values of the relevant characteristics according to Annex G of the EN 14411 standard. For more information request technical data sheets according to model.
Indoor environment (for indoor applications), e.g. temperature, humidity, chemical exposure	Minimum values of the relevant characteristics according to Annex G of the EN 14411 standard. For more information request technical data sheets according to model.
Conditions of use, e.g.: frequency of use, mechanical exposure, etc.	For more information request technical data sheets according to model.
Maintenance, e.g.: required frequency, type and quality and replacement of replaceable components	For more information request technical data sheets according to model.

Representativeness, quality and selection of data

The raw data has been directly provided by Gres de Aragón and this data corresponds to one production centre of the enterprise property. For the secondary data, the most updated GaBi ts databases have been used and modelled with GaBi version 10.5.1.128. All data belong to a geographical scenario of Spain 2021.

The results presented are representative of ceramic coverings, expressed as average values weighted by the production of the ceramic coverings pertaining Bla group.

Time-related coverage

The manufacturer's specific data represented a full year and were less than 5 years old. Specifically, the most recent stable data of the analysed product manufacturing plant were used (data relating to the year 2021).

Geographic coverage

Wherever possible, data were used relating to the country in which the process at issue was developed or, when this was not possible, regional or global data were applied.

Technological coverage

The data used reflected the technological reality of the system analysed.

Database(s) and LCA software used

- GaBi database: Database for Life Cycle Engineering. SpheraSolutions Upgrade 2021.2 Edition (February 21, 2021 - SP 40).
- GaBi v 10 software-system. SpheraSolutions. Compilation 10.5.1.128
- Ecoinvent v 3.7.1

Description of system boundaries

Cradle to grave and module D (A + B + C + D)

Allocation and cut-off rules

In this cradle-to-grave LCA study, a cut-off rule of 1% for the energy use (renewable and non-renewable) and 1% of total mass in those unitary processes, whose data is insufficient, have been applied. In total, more than 95% of all mass and energy inputs and outputs of the system have been included, excluding the not available nor quantified data. The principle of modularity in the allocation of environmental loads, i.e. that they apply where they occur, and the "polluter pays" principle have been followed. In addition, a physical allocation has been made on the basis of mass.

The excluded data are the following:

- Diffuse particle emissions to the atmosphere during the transportation and storage of powdery nature raw materials.
- Non-regulated channel emissions generated during combustion stages (spray drying, piece drying and firing).
- The recycling and reutilization of the residues generated during the life cycle of the ceramic coverings according to PCR. However, the recycling process of the residues and the benefits obtained from this recycled will be quantified in module D.
- Waste management and transport to landfill have not been included in glaze manufacturing.

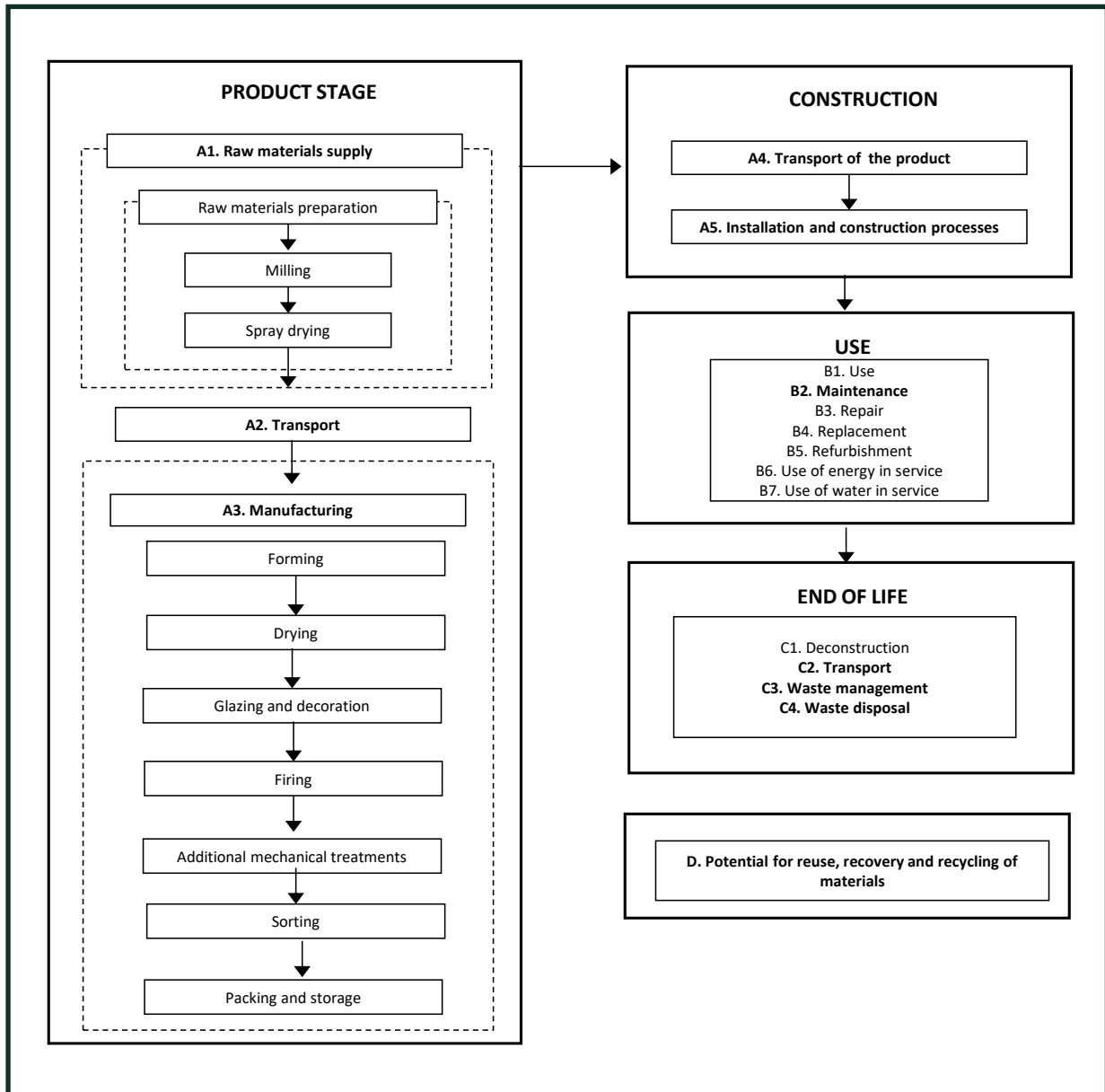
- Machinery and industrial equipment production.

Electric mix

Renewables: 23.9%; Nuclear: 31.7%; Fossil: 30.3%.

Climate impact of electricity production: 0.062kg CO₂ eq./MJ

System diagram



Environmental impact methodologies

The selected impact categories and flow indicators, the applied impact assessment methods and the characterisation factors used were those recommended by standard EN 15804:2012+A2:2019

included in the Environmental Footprint method. The applied characterisation factors were those available at the following Web link: <https://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml>.

A1-A3 Product Stage

Raw materials supply and transport (A1 y A2)

The raw materials required for the ceramic tiles manufacturing are classified as: plastic raw materials and non-plastic or degreasing raw materials. Specifically, the raw materials included in the composition of the support are clays, feldspars and sands, as well as waste from the factory itself and external factories, which can be sludge or ceramic pieces generated before and after the firing stage, introduced in the grinding stage of the raw materials.

Regarding glaze raw materials, the most used in the formulation are the following ones: quartz, kaolin, borax, alkaline feldspars, nepheline, calcium carbonate, dolomite, zircon, wollastonite, calcined alumina and ceramic frits.

The ceramic frits are insoluble glasses, prepared in an external company by complete fusion of their original raw materials, called "frits". It is estimated that around 35% of the raw materials used in the glaze applied on porcelain stoneware tiles are submitted to fritting process.

The raw materials used have different origins according to their nature and properties. The raw materials coming from outside Spain are transported by freighter to the port of Castelló, and from there by truck to the spray-dried granule plant (external supplier). For sea transport the freighter selected is a transoceanic one, whose distance traversed depends on the origin of each case, whereas for road transport a 27t truck which meets the Euro6 standard has been chosen. All raw materials are transported in bulk, that is, they do not require packaging material, except the decoration materials which are transported in a 17.3t payload truck, from the frits and glaze factory to Gres de Aragón plant.

The preparation of raw materials for the ceramic body of Gres de Aragón ceramic tiles is carried out in the factories of the spray-dried granule suppliers. In this process, the proportion of raw materials is defined and their origin is adjusted to the characteristics of the production process and the final performance required.

The spray-dried granules are obtained by wet milling of the raw materials and subsequent spray drying. This spray-dried is transported to the Gres de Aragón plant by 27t truck.

Manufacturing (A3)

This process and the following treatments applied to the tiles are carried out in Gres de Aragón plant. The procedure is the following: the spray-dried powder is discharged in storage hoppers and with a feed system based in conveyor belts with weight control, this granule is sent to the forming stage by uniaxial dry pressing, carried out by hydraulic or oleodynamic presses.

The pieces formed are placed in a 5-plane roller dryer to reduce their humidity, duplicating or triplicating their mechanical resistance, which allows for their subsequent processing.

The tiles coming from the dryer can be covered with one or more thin layers of engobe and glaze, which are applied over the ceramic body through Airless techniques. In addition, the product is decorated using the injection of inkjet inks. This treatment is carried out to give the surface of the fired product a series of technical and aesthetic properties, such as impermeability, ease of cleaning, gloss, colour, surface texture, chemical and mechanical resistance.

Firing is the most important stage of the ceramic tiles production process, as it is when the pieces, previously shaped, experience a fundamental modification of their features, resulting in a tough, water and chemical resistant product, as well as resistant to frost. The ceramic pieces are subject to a single firing single-deck roller kiln.

Once the piece is fired, in some cases mechanical treatments such as cutting or rectified etc. are applied to provide new effects. The cutting or rectified phase is necessary to transform the big pieces into the format requested by customers, thus improving the dimensional quality of the parts.

After passing the quality control processes, the sorted pieces are packed in a primary cardboard container and packed on wooden pallets, covered with LDPE film and strapped to prevent load movement.



A4-A5 Construction Process Stage

A4 Transport

Product distribution is as follows: 35% in Spain, 39% in Europe and 26% to the rest of the world.

For road transport, a 27t truck classified Euro 6 has been considered (national transport and European, average distance of 300km and 1390km, respectively). For transcontinental transport, an average transoceanic freighter has been estimated (transport to the rest of the world, 6520km), as indicated in EN 17160.

Parameter	Result (expressed per functional unit)
Fuel type and consumption	According to the destinations in the distribution as described above: 0.34 l diesel (truck Euro 6, 27 t) 0.034 l fueloil (freighter)
Distance	300 km national distribution: 35% 1390 km European distribution: 39% 6520 km rest of the world distribution: 26%
Capacity utilisation (including no-load return)	85% in truck 100% freighter

Parameter	Result (expressed per functional unit)
Bulk density of transported products	≈1800kg/m ³

A5 Product installation and construction process

Once the product is unpacked, it is installed. According to the PCRs for ceramic tiles, it has been established that the application of mortar is required for installation.

Glue mortars are cementitious adhesives consisting of a mixture of hydraulic binders, mineral fillers and organic additives, which only need to be mixed with water or liquid addition just before use. They consist of a mixture of white or grey cement, mineral fillers of siliceous and/or limestone nature and organic additives: water retaining agents, water re-dispersible polymers, rheology modifiers, fibres, etc.

Wastes derived from the packaging of the pieces is managed separately according to the geographical location of the installation site. Otherwise, 3% of product losses have been considered at the installation stage.

Parameter	Result (expressed per functional unit)
Material 1: Cement glue	3.3 kg
Water use	0.8 l
Use of other resources	Not applicable
Quantitative description of the type of energy (regional mix) and consumption during the installation process	Not applicable
Waste of materials at the construction site before processing of waste generated at the product installation (specified by type)	Product losses: 618g Packaging wastes: <ul style="list-style-type: none"> - Cardboard: 74 g - Plastic: 8g - Wood: 224 g
Output of materials (specified by type) as a result of waste treatment waste at the construction site, e.g. from waste collected for recycling, energy recovery, disposal (specified by route)	Product losses for recycling: 432g Product losses for final deposition: 185g Cardboard for incinerating: 0g Cardboard for recycling: 74g Cardboard for final deposition: 0 g Plastic for incinerating: 1 g Plastic for recycling: 6g Plastic for final deposition: 1 g Wood for incinerating: 59g Wood for recycling: 160g Wood for final deposition: 5 g
Direct emissions to ambient air, soil and water	Not applicable

B1-B7 Use Stage

B1 Use

Once installed, ceramic tiles do not require any energy input for their use, nor do they require maintenance after installation, except for normal cleaning operations. For this reason, of all the aforementioned modules, only the environmental loads attributable to product maintenance (module B2) are considered.

B2 Maintenance

Cleaning is done with a damp cloth and, if the surface is dirty or greasy, cleaning agents such as detergents or bleaches can be used. In this study, a production-weighted average scenario has been considered, according to the maintenance frequency applicable to each product application (industrial, swimming pools, indoor and outdoor flooring) during the 50-year life of the product. The results are presented in the following table.

Parameter	Result (expressed per functional unit)
Maintenance process	Weighted average according to the use of each product: industrial, swimming pools, indoor and outdoor flooring.
Maintenance cycle	Washing once every two weeks with water and detergent
Auxiliary materials for maintenance (e.g. cleaning products) (specify each material)	Detergent: 1.34E-04 kg/m ²
Material wastage during maintenance (specify type)	Not applicable
Net tap water consumption	0.1 l/m ²
Energy input during maintenance (e.g. vacuum cleaning), type of energy carrier (e.g. electricity) and amount, if applicable and relevant	Not applicable



B3-B4-B5 – Repair, replacement and refurbishment

The tiles do not require repair, replacement or renovation

B6-B7 – Operational energy use and Operational water use

These modules are not relevant for ceramic tiles.

C1-C4 End of Life Stage

C1 Deconstruction and demolition

At the end of its service life, the product will be removed, either as part of a building renovation or during demolition. In the context of the demolition of a building, the impacts attributable to the removal of the product are negligible.

C2 Transport

The product waste is transported in a heavy-duty truck (27 t) that complies with Euro 6 standards to be managed either by deposition in inert landfills or recycling. An average distance of 50km from the building site to the destination is considered. Also included is the return of the trucks (100% empty return).

C3 Waste management for reuse, recovery and recycling

It has been estimated that 70% of tiles are recycled and/or reused, as indicated in the PCR.

C4 Final disposal

It is estimated that 30% of the product is sent to controlled landfill after the end of its service life.

Parameter	Result (expressed per functional unit)
Collection process, specified by type	23.9 kg/m ²
Recovery system, specified by type	16.7 kg recycled as filler material
Disposal, specified by type	7.2 kg to controlled landfill
Assumptions for scenario development (e.g.: transport)	The product waste is transported in a heavy-duty truck (27 t) that complies with Euro 6 standards to be managed either by deposition in inert landfills or recycling. An average distance of 50km from the installation site to the final destination is considered. The return trip of the trucks is also included (100% empty return).

Module D Potential environmental benefits and burdens of reuse, recovery and recycling activities

The environmental burdens and benefits of obtaining secondary material from waste generated at the manufacturing stage (waste such as cardboard, plastic and wood), at the installation stage (product losses, tile packaging waste: cardboard, plastic and wood) and at the end of life of the product have been considered.

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation:

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage	
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Benefits and burdens beyond the system	
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Geography	ES			EU														EU
Specific data used	>90%					-	-	-	-	-	-	-	-	-	-	-	-	
Variation – products	-23%/+55%			-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation – sites	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	

5. Content information

Product components		Weight (%)	Post-consumer material, weight-%	Renewable material, weight-%
CERAMIC'S BODY	Clay, feldspar, kaolin, sand, etc	98%	0%	0%
GLAZE	Borates, feldspar, clay, etc	2%		0%
INKS	-	-		0%
TOTAL		100%	0%	0%

All sizes and models have the same components. The substances contained in the product listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorisation" do not exceed 0.1% by weight of the product.

6. Biogenic carbon content

As required by standard EN 15804:2012+A2:2019, the carbon content of both the product and its packaging was separately declared. In the case of the product at issue, ceramic tiles, the tile components were inorganic, so that the biogenic carbon calculation did not apply.

In regard to the packaging used for tile distribution, its mass was less than 5% of the total product mass, so that the declaration of packaging biogenic carbon content was omitted. The mass percentage of the packaging used was declared for each type of studied tile in the following table.

Packaging materials	Weight, kg/m ²	Weight-% (versus the product)
Cardboard	7.5E-02	0.36%
Plastic	7.8E-3	0.04%
Wood	2.2E-1	1.09%

7. Environmental Information

The results refer to 1 m² of a surface (flooring) of a residential area for 50 years with porcelain stoneware tiles (20.6 kg/m² average weight). The results of the Life Cycle Impact Assessment are relative expressions and do not predict final impacts by category, threshold exceedances, safety margins or risks.

Potential environmental impact – mandatory indicators according to EN 15804:2012+A2:2019

Results per functional unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG¹	kg CO ₂ eq,	11.0	9.8E-01	1.5	0	4.4E-01	0	0	0	0	0	0	1.2E-01	0	1.3E-01	-2.2E-01
GWP-fossil	kg CO ₂ eq,	11.2	1.0E+00	1.5	0	5.8E-01	0	0	0	0	0	0	1.3E-01	0	1.3E-01	-2.3E-01
GWP-biogenic	kg CO ₂ eq,	5.4E-02	-9.6E-04	-4.2E-03	0	3.4E-03	0	0	0	0	0	0	-1.6E-04	0	1.3E-03	-5.5E-04
GWP-luluc	kg CO ₂ eq,	8.6E-03	7.2E-03	1.2E-03	0	3.4E-05	0	0	0	0	0	0	1.0E-03	0	5.5E-04	-6.5E-04
GWP-total	kg CO ₂ eq,	11.3	1.0	1.5	0	0.6	0	0	0	0	0	0	1.3E-01	0	1.3E-01	-2.3E-01
ODP	kg CFC 11 eq,	1.9E-08	1.3E-16	5.7E-10	0	2.1E-07	0	0	0	0	0	0	1.6E-17	0	7.3E-14	-2.3E-09
AP	mol H ⁺ eq,	2.3E-02	5.4E-03	3.2E-03	0	5.1E-03	0	0	0	0	0	0	1.0E-04	0	9.3E-04	-6.4E-04
EP-freshwater	kg P ⁻ eq,	5.5E-05	2.6E-06	3.3E-06	0	1.0E-05	0	0	0	0	0	0	3.7E-07	0	2.7E-06	-1.5E-06
EP-freshwater	kg PO ₄ ³⁻ eq,	1.7E-04	8.1E-06	1.0E-05	0	3.2E-05	0	0	0	0	0	0	1.1E-06	0	8.2E-06	-4.5E-06

¹ The indicator includes all greenhouse gases included in GWP-total, excluding biogenic carbon dioxide and product biogenic carbon emissions. This indicator is equivalent to the GWP indicator defined in EN 15804:2012+A1:2013.

Results per functional unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
EP-marine	kg N eq,	6.0E-03	1.4E-03	1.0E-03	0	5.5E-04	0	0	0	0	0	0	2.8E-05	0	2.6E-04	-2.1E-04
EP-terrestrial	mol N eq,	6.6E-02	1.6E-02	1.1E-02	0	2.1E-02	0	0	0	0	0	0	3.4E-04	0	2.7E-03	-2.3E-03
POCP	kg NMVOC eq,	1.8E-02	4.1E-03	2.9E-03	0	3.7E-03	0	0	0	0	0	0	9.4E-05	0	7.5E-04	-5.4E-04
ADP-min&met²	kg Sb eq,	2.3E-05	7.1E-08	7.5E-07	0	1.8E-08	0	0	0	0	0	0	9.5E-09	0	1.3E-08	-5.1E-08
ADP-fossil²	MJ	193.0	13.2	12.7	0	2.8	0	0	0	0	0	0	1.7	0	1.7	-2.3
WDP	m ³ , global private equivalent	3.5	7.8E-03	2.2E-01	0	17.2	0	0	0	0	0	0	1.1E-03	0	9.7E-03	4.5E-02
Acronyms	Global Warming Potential, UNE EN15804:2012+A1:2014 (GWP-GHG); Total Global Warming Potential (GWP-total); GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential. Accumulated Exceedance; EP-freshwater = Eutrophication potential. Fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential. Fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential. Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential. deprivation-weighted water consumption															

² The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Use of resources

Results per functional unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	52.5	6.6E-01	3.2	0	11.2	0	0	0	0	0	0	9.3E-02	0	2.0E-01	-2.1
PERM	MJ	5.1	0	1.5E-01	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	57.6	6.6E-01	3.3	0	11.2	0	0	0	0	0	0	9.3E-02	0	2.0E-01	-2.1
PENRE	MJ	193.0	13.2	12.7	0	2.8	0	0	0	0	0	0	1.7	0	1.7	-2.3
PENRM	MJ,	3.3E-01	0	1.0E-02	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	193.3	13.2	12.7	0	2.8	0	0	0	0	0	0	1.7	0	1.7	-2.3
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m ³	5.3E-02	7.5E-04	4.2E-03	0	2.2E-01	0	0	0	0	0	0	1.1E-04	0	3.2E-04	-9.6E-04
Acronyms	<p>PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water</p>															

Waste production and output flows

Waste production

Results per functional unit												
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1.2E-02	6.0E-10	3.7E-04	0	4.5E-11	0	0	0	0	0	0
Non-hazardous waste disposed	kg	1.9E-01	1.9E-03	3.3E-01	0	6.3E-02	0	0	0	0	0	0
Radioactive waste disposed	kg	6.6E-03	1.6E-05	4.4E-04	0	3.0E-05	0	0	0	0	0	0

Output flows

Results per functional unit												
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	6.4E-02	0	6.4E-01	0	0	0	0	0	0	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0
Exported energy. electricity	MJ	0	0	0	0	0	0	0	0	0	0	0
Exported energy. thermal	MJ	0	0	0	0	0	0	0	0	0	0	0

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