

GlobalEPD

A VERIFIED ENVIRONMENTAL DECLARATION



Environmental
Product
Declaration

EN ISO 14025:2010

EN 15804:2012+A2:2019/AC:2021

EN 17160:2026

PAMESA
cerámica

AENOR

**PAMESA CERÁMICA
COMPACTTO S.L.U.**

**Ceramic tiles. Extra-thick
porcelain stoneware
(Bla 20 mm)**

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The owner of this Declaration is responsible for its content, as well as for keeping the supporting documentation that justifies the data and statements included during the period of validity.

Owner of the Declaration



PAMESA CERÁMICA COMPACTTO S.L.U.
Calle Pina de Montalgrao 2
(Carretera Vila-real – Onda km 2,7)
12540 Vila-real, Castellón. Spain

Tel. (+34) 964 50 75 00
Mail comunicacion@pamesagrupoempresarial.com
Web <https://www.pamesagrupoempresarial.com/>

LCA Study



Instituto de Tecnología
Cerámica – (ITC-AICE)
Campus Universitario Riu Sec
Av. Vicent Sos Baynat s/n
12006, Castelló, Spain

Tel. (+34) 964 34 24 24
Mail sostenibilidad@itc.uji.es
Web www.itc.uji.es

Operator of the Global EPD Programme EPD



AENOR CONFÍA, S.A.U.
C/ Génova 6
28004 – Madrid
Spain

Tel. (+34) 902 102 201
Mail aenordap@aenor.com
Web www.aenor.com

AENOR is a founding member of ECO Platform, the European Association of Environmental Product Declaration Verification Programmes.

The Standards EN 17160:2026 PCR for Ceramic tiles and EN 15804:2012+A2:2019/AC:2021 serve as the basis for the PCR

Independent verification of the declaration and data, in accordance with the Standard ISO 14025:2010

☐ Internal

☒ External

Verification body

AENOR

Product certification organization accredited by ENAC with accreditation No.1/C-PR468

1. General information

1.1. Description of the organisation

PAMESA CERÁMICA COMPACTTO, the parent company of PAMESA GRUPO EMPRESARIAL, specializes in the design and sale of ceramic tile materials. Our main goal is to forge a reputation for excellence in our sector, offering consumers top-quality products and services, while also striving constantly to reduce the company's environmental impact.

1.2. Scope of the declaration

This Environmental Product Declaration includes environmental information on a group of products manufactured by ECOPORCELÁNICO and marketed by PAMESA CERAMICA COMPACTTO within the geographical and technological context of Spain between October 2024 and October 2025.

The location of the production centre is shown below:

Ecoporcelánico S.L.U.
Av. Manuel Escobedo, 25, 12200 Onda,
Castellón, Spain

PAMESA also has other facilities relating to other stages of the production process:

Mina Elena Localities of Estercuel y Gargallo, Teruel, Spain
Mina Pilón Localities of Mas de las Matas, Castellote y Seno, Teruel, Spain
Mina Valdecastillo Localities of Berge, Castellote y Seno, Teruel, Spain
Mina Valroyo Localities of Mas de las Matas, Castellote y Seno, Teruel, Spain
Compacglass II Camí de la lloma de Miralcamp, 4, 12200 Onda Castellón, Spain
Logistic Centre 1 Camino del Palmeral, 10 P.I Colomer, 12200 Onda, Castellón, Spain
Logistic Centre 2 Calle del Toll, 24, 12200 Onda, Castellón, Spain
Logistic Centre 3 Calle del Toll, 11, 12200 Onda, Castellón, Spain
Logistic Centre 4 Carretera CV-20 Km 3,5, 12200 Onda, Castellón. Spain
Logistic Centre 5 Camí Miralcamp 47-49, 12200 Onda, Castellón, Spain
Logistic Centre 6 Camí cuadra la Torta, 2, 12006 Castellón de la Plana, Castellón Spain
Logistic Centre 7 Calle Argentina, 93 P.I. Sur 13, 12200 Onda, Castellón, Spain

Logistic Centre 8 Calle Ratils, 23 P.I. Colomer, 12200 Onda, Castellón, Spain
Logistic Centre 9 Calle Panamá, 1 esq. P.I. Sur 13, 12200 Onda, Castellón, Spain
Logistic Centre 10 Avda. Mediterráneo, 53, 12200 Onda, Castellón, Spain
Logistic Centre 11 Carretera Castellón – Alcora Pza. Polígono 4, 4 P.G. 12, 12130 Sant Joan de Moró, Castellón, Spain

The results shown the environmental performance of the extra-thick porcelain stoneware tiles, as average weighted by production. Moreover, the environmental data of the tiles with the lowest and highest impact, thus narrowing down the results obtained in the LCA are also declared. The scope of this Environmental Product Declaration (hereinafter EPD) is from cradle to grave and module D.

1.3. Life cycle and compliance

This EPD has been developed and verified in accordance with EN ISO 14025:2010 and EN 15804:2012+A2:2019/AC:2021 the following Category Rules:

INFORMATION ABOUT PRODUCT CATEGORY RULES	
Descriptive title	Product Category Rules for Ceramic Tiles
Registration code and version	EN 17160:2026
Publication date	2026
Compliance	EN 15804:2012+A2:2019/AC:2021
Programme administrator	AENOR

This Environmental Statement includes the following life cycle stages:

Limits of the system

Information modules considered

Product Stage	A1	Raw materials supply	X
	A2	Transport	X
	A3	Manufacturing	X
Construction	A4	Transport of the product	X
	A5	Installation and construction processes	X
Use	B1	Use	X
	B2	Maintenance	X
	B3	Repair	X
	B4	Replacement	X
	B5	Refurbishment	X
	B6	Use of energy in service	X
	B7	Use of water in service	X
End of Life	C1	Deconstruction	X
	C2	Transport	X
	C3	Waste management	X
	C4	Waste disposal	X
	D	Potential for reuse, recovery and recycling of materials	X
X = Module included in the LCA; ND = Module not declared			

This EPD may not be comparable with those developed in other Programmes or according to different reference documents, in particular it may not be comparable with EPDs not developed according to EN 15804+A2.

Similarly, this EPD may not be comparable if the origin of the data is different (e.g. databases), not all relevant information modules are included, or they are not based on the same scenarios.

The comparison of construction products should be done on the same function, applying the same functional unit and at the level of the building (or architectural or engineering work), i.e. including the behaviour of the product throughout its life cycle, as well as the specifications of section 6.7.2 of the EN ISO 14025:2010 standard.

2. Product information

2.1. Product identification

The ceramic tiles included in this study belong to group BIa (extra-thick porcelain stoneware), a classification based on standard EN 14411: 2016 (equivalent to standard ISO 13006:2018), meaning that they have a water absorption rate of less than 0.5% and are formed by pressing. Their common name is porcelain stoneware.

The porcelain stoneware tiles covered in this study comprise four standard sizes, both glazed and with mechanical treatments, 20 mm thick, with an average fired weight of 39.76 kg/m².

The appendices contain the results for the tile sizes included within the scope of this EPD, showing the minimum and maximum environmental impact. These correspond to the following sizes: 60x60N cm, weighing 39.13 kg/m², and 90x90N cm, weighing 41.48 kg/m², after firing, respectively.

The CPC code of the product is 37370.

This EPD covers residential outdoor flooring as a study scenario. However, the versatility of these ceramic tiles allows them to be installed in other locations such as walls, roofs, façades, indoor paving and other types of buildings with varying levels of foot traffic, such as hospitals, schools, offices and shopping centres.

2.2. Product technical features

The manufacturer declares the following information on the technical specifications of the product:

Product technical features

Description	Standard	Requirements
Surface quality	EN-ISO 10545-2	Complies with the standard
Tiles without defects		
Dimensions		
Maximum deviation		
From edge curvature		
From centre curvature		
Water absorption	EN-ISO 10545-3	0.5%
Modulus of rupture	EN-ISO 10545-4	> 7.000 N
Resistance to thermal shock	EN-ISO 10545-9	Resists
Crazing resistance	EN-ISO 10545-11	Resists
Frost resistance	EN-ISO 10545-12	Resists
Chemical resistance	EN-ISO 10545-13	Clase A
Stain resistance	EN-ISO 10545-14	Minimum class 5
Slip resistance (Pendulum)	EN 16165 Annex C	Class 3

2.3. Product composition

The composition declared by the manufacturer is as follows:

Product composition

Substance/Component	Content
Support (clays, feldspars, sands, etc.)	97.41%
Decoration raw materials (grits, glazes and inks)	2.59%

Substances contained in the product that are listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorisation" do not exceed 0.1% by weight of the product.

3. LCA information

3.1. Life cycle assessment

The LCA has been carried out with the support of the LCA for Experts software (Sphera-GaBi) [7] and with the last database version 2026.1. (SP40.0) [8] (SpheraSolutions). The characterisation factors used are those set out in standard EN 15804:2012+A2:2019/AC:2021, in accordance with the Environmental Footprint (E.F. 3.1) method. This EPD is based on LCA report [10].

3.2. Functional unit

The functional unit considered is **“Tiling and finishing of 1 m² of an outdoor floor with ceramic tiles from the Bla thick group (various formats with a thickness of 20 mm and an average weight of 39.76 kg/m²) for 50 years”**.

3.3. Reference service life (RSL)

The reference service life 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 long-lasting product that does not require replacement. A service life of 50 years has been considered.

Reference service life

Parameter	Unit (expressed per functional unit)
Reference service life	Minimum 50 years
Declared product properties (on gate), coatings, etc.	Results of the relevant characteristic values in accordance with Annex G of standard EN 14411. For more information, request technical data sheets according to model.
Design parameters of the application (manufacturer's instructions), including references to good practices	For further information: Request installation guidelines for thick ceramic tiles.
Estimated quality of work, when installed according to the manufacturer's specifications	For further information: Request installation guidelines for thick ceramic tiles.

Parameter	Unit (expressed per functional unit)
Installed from outside environment (for outdoor applications), e.g. weathering, pollutants, UV radiation and wind exposure, building orientation, shading, temperature, etc.	Results of the relevant characteristic values in accordance with Annex G of standard EN 14411. For more information, request technical data sheets according to model.
Indoor environment (for indoor applications), e.g. temperature, humidity, chemical exposure	Results of the relevant characteristic values in accordance with Annex G of standard EN 14411. 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, for example the required frequency, type and quality, and replacement of replaceable components	This installation method allows all components to be replaced and reused. For further information, please request the installation guidelines for thick ceramic tiles.

3.4. Allocation rules

In accordance with the standards and PCR, the principle of causality has been applied when assigning inputs and outputs in processes with multiple inputs and/or outputs. Therefore, an attempt has been made to establish the physical relationship between the inputs and outputs of the system and its different products.

In general, the inputs and outputs assigned to the declared unit have been weighted averages based on the classified saleable production, total production or specific weight of the tiles before and after firing, according to the criteria for each stage of the process.

3.5. Cutt of rule and exclusions

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 excluded data are the following:

- Diffuse emissions of particulate matter into the atmosphere generated during the transport and storage of powdered raw materials.
- Channelled atmospheric emissions, not subject to legislation, generated during combustion stages.
- Long-term emissions (>100 years).
- The production of goods, machinery, infrastructure and industrial equipment with a replacement cycle of less than one year.
- Waste generated in mines, other than unusable soil, which is managed externally. The recycling and reuse of waste generated throughout the life cycle of ceramic coatings that are to form part of another system, in accordance with the RCP.

3.6. Representativeness, quality and selection data

The primary data relating to the manufacturing plant, mines, spray dried facilities and logistics centres has been provided directly by the PAMESA Group.

Secondary data was obtained from the most up-to-date Sphera-GaBi databases [8] and modelled using LCA for Experts (Sphera-GaBi) [7] and in one process, the Ecoinvent version 3.9.1 LCA method 'Cut-Off' database has been used. All data refers to a geographical scenario for Spain in 2024.

All tile manufacturing data relates to a geographical area in Spain between October 2024 and October 2025, with the exception of three mines and logistics centres that are less than five years old.

The electricity consumption considered in this study corresponds to the average for the study period. The electricity labelling published by the CNMC (National Commission for Markets and Competition) has been used as a reference for modelling the electricity mix.

The results presented are representative of ceramic tiles, expressed as an average weighted by the production of the ceramic tiles belonging to the Bla thick group range, limiting this average by the products with the minimum and maximum environmental impact.

The product is manufactured entirely in Spain and marketed worldwide; however, its installation, use and end-of-life occur predominantly in Spain, Europe and the rest of the world, according to the company's sales data.

Consequently, scenarios have been developed for the installation and end-of-life stages based on sales percentages. Further details are provided on the data quality information table.

Information on data quality	
Data collection	01/10/2024 – 31/10/2025 2023 Three Mines and Logistics Centres
Sites used	ECOPORCELÁNICO manufacturing plant in Onda (Castellón) Quarries located in the province of Teruel; logistics centres located in Onda, San Juan de Moró and Castellón (Castellón)
Geography	ECOPORCELÁNICO manufactures 100 % of its products in Spain. Sales are distributed as follows: 11.9 % in Spain, 61.2 % in Europe and 26.9 % in the rest of the world; the EPD is modelled to reflect usage and disposal in line with sales
Technology	The product consists of a substrate and decorative material. The processes involved are the extraction of raw materials, spray drying of granules, tile firing, mechanical treatments, storage at logistics centres and the manufacture of decorative materials
Average	Weighted average production covering 20 mm thick products in ECOPORCELÁNICO

Information on data quality	
ICV/ACV database	Sphera data bases. Managed LCA Content 2026.1 Ecoinvent 3.9.1 LCI Method Cut-Off
EPD used	ANFFECC, 2024. Liquid-basis glazes Spanish sector EPD. The International EPD® System. Registration number: EPD-IES-0015444. ANFFECC, 2024. Inks of Digital inkjet - Spanish sector EPD. The International EPD® System. Registration number: EPD-IES-0015447.
Data quality scheme	EN 15804:2012+A2:2019, Annex E, table E.1
Use of regular data with more than 30% basic impact	Regular data with more than a 30% impact is not used
Use of poor relevant data	Poor data is not used
Use of very poor relevant data	Very poor data is not used

3.7. Other calculation rules and assumptions

Various factors have been taken into account:

- A cycle of reuse for the tiles at the end of their service life has been assumed. These benefits are set out in Module D.
- The recommended frequency for washing outdoor floors is once a month.

The global warming potential (total GWP) of the various technologies that make up the electricity mix used is 0.41 kgCO₂ eq/KWh. The global warming potential (total GWP) of the thermal energy consumption in the manufacture of floor tiles is 0.0758 kgCO₂ eq/MJ.

The four ceramic tile references have different weights and environmental impacts.

Annex I and Annex II show the environmental impact results, expressed in absolute values and for all modules of the life cycle of the format that has the lowest and highest environmental impact, respectively.

The following table shows the deviations between the formats with the highest and lowest environmental impact and the average, in relation to the product stage (A1-A3).

Impact Indicator	Relative variation from the average
GWP-total	0.48%/+0.24%
AP	0.32%/+0.16%
POCP	0.32%/+0.16%

The deviation from the average scenario has been calculated by comparing the results obtained in the various scenarios analysed against the mean value for each impact category. Subsequently, the average percentage deviation has been determined, distinguishing between negative and positive variations relative to the average scenario.

Biogenic carbon content

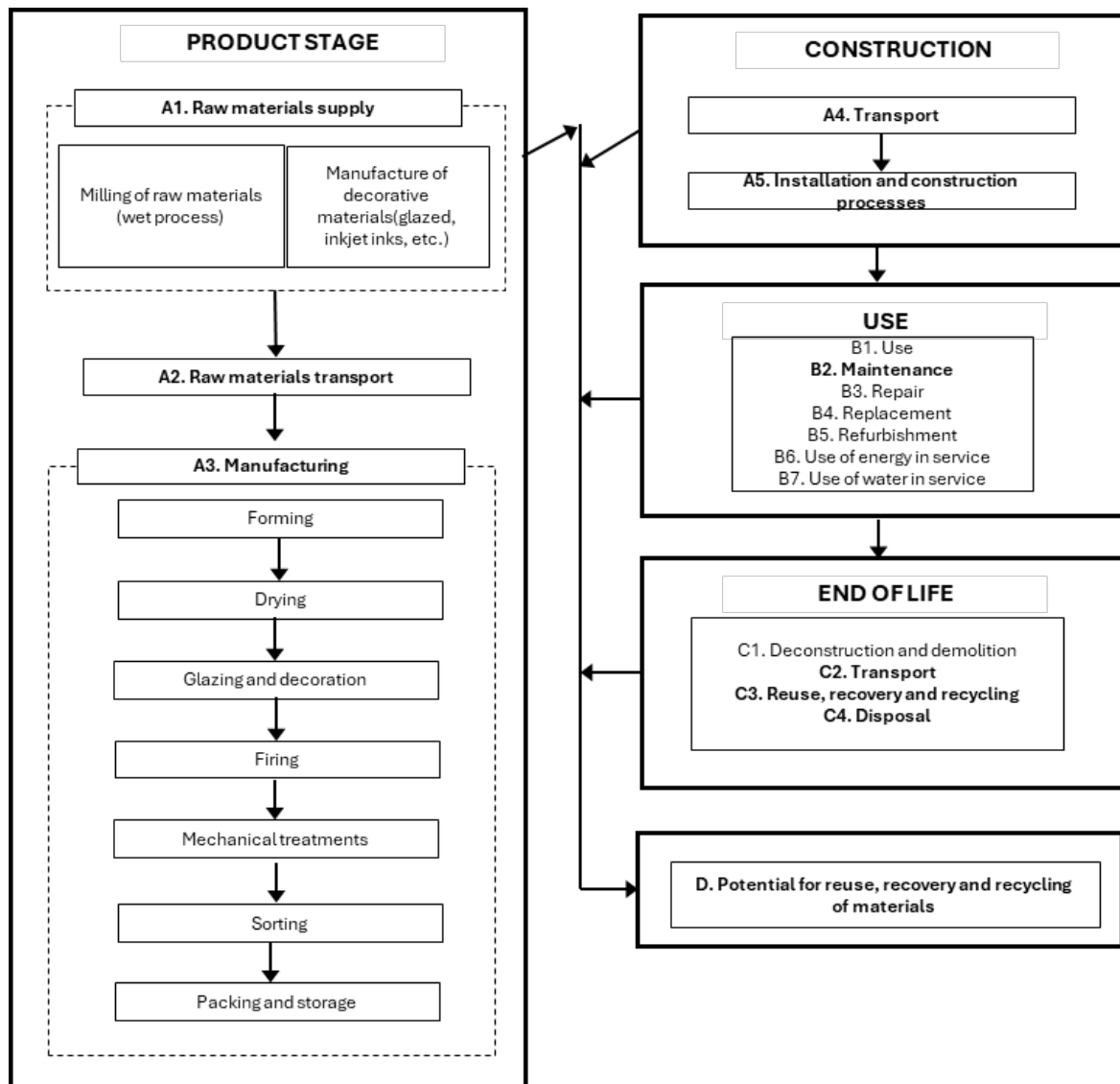
Ceramic tiles are mineral products and therefore do not contain biogenic carbon. According to standard EN 16449, it is necessary to calculate the biogenic carbon content, which in this case originates from packaging, wooden pallets and cardboard.

Biogenic carbon content	
Parameter	Unit (expressed per functional unit)
Biogenic carbon content of the product	-
Biogenic carbon content of the packaging	0.313 kg C

In assessing the global warming potential of biogenic sources, the biogenic carbon stored in packaging has been taken into account; this is calculated in accordance with EN 15804+A2 on the basis of its carbon content, converted to CO₂ equivalent using the factor 44/12. CO₂ sequestration is accounted for in A1–A3, and its subsequent release offsets this storage in A5.

4. System limits, scenarios and additional technical information

All life cycle modules relevant to ceramic tiles according to the PCRs have been included:



4.1. Pre-manufacturing processes (upstream)

Raw materials (A1) and Transport (A2)

Ceramic tiles are composed of a ceramic support and a decorative layer.

The raw materials included in the composition of the substrate are mainly clays, feldspars, sands, and ceramic waste generated during manufacture. Some of the clays used in the composition of Bla Espesorado come from quarries managed by Pamesa.

The raw materials for decoration (glazes, engobes and inks) are produced in specialised plants. The most common decorative materials are enamels and inks.

The raw materials used have different origins, according to their nature and properties; they are transported by road or by ship in bulk, depending on the distance and location of the extraction point.

4.2. Manufacturing of the product

Manufacturing (A3)

The raw materials are wet-ground and spray dried to form granules.

The spray dried granules are shaped by unidirectional dry pressing and then fed into a continuous dryer to reduce their moisture content.

The pieces, fresh from the dryer, are covered with one or more layers of slip and glaze, and decorated by ink injection.

The pieces are then fired in single-layer roller kilns, resulting in a hard material that is resistant to water and chemicals.

All parts undergo mechanical surface grinding. Once they have passed the quality control checks, the sorted parts are assembled and packed. Finally, they are transported to the brand's logistics centres for distribution.

4.3. Construction processes

Transport (A4)

The product is distributed 11.9% in Spain, 61.2% in Europe and 26.9% in the rest of the world.

A4 Transport to site

Scenario information	Unit (expressed per functional unit)
Type and fuel consumption of the vehicle, type of vehicles used for transport, e.g. long distance trucks, ship, etc.	According to the destinations in the distribution as described above: 0.71 l diesel (Truck Euro 6, 27 t) 0.04 fuel oil (Ship)
Distance	11.9% Spain: 300 km 61.2% Europe: 1390 km 26.9% Rest of the world: 6520 km ship and 400 km truck
Capacity utilisation (including no-load return)	85% in trucks 100% Ship
Bulk density of transported products	216.19 kg/m ³
Usable capacity factor (factor: = 1 or < 1 or ≥ 1 for products that are packed compressed or nested)	1

Product installation and construction process (A5)

Once the product has been unpacked, installation can begin. In accordance with Pamesa's installation guidelines, the units are installed either directly on the floor or on pedestals; in this case, they are installed directly on the floor.

Packaging waste is managed separately depending on the geographical location of the facility; to this end, three scenarios have been proposed. Based on sales distribution, waste management plans have been drawn up for Spain, Europe and the rest of the world.

On the other hand, a 15% product loss during the tile installation stage has been considered.

A5 - Installation

Scenario information	Unit (expressed per functional unit)
Supplementary materials for installation (specify each material)	Not applicable
Water use	Not applicable
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: 5,965 g Packaging wastes: Cardboard: 247 g Plastic: 50 g Wood: 457 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: 4,175 g Product losses for final deposition: 1,789 g Incinerated cardboard: 6 g Recycled cardboard: 225 g Cardboard for final deposition: 17 g Incinerated plastic: 8 g Recycled plastic: 36 g Plastic for final deposition: 6 g Incinerated wood: 169 g Recycled wood: 204 g Wood for final deposition: 83 g
Direct emissions to ambient air, soil and water	Not applicable

4.4. Use linked to the structure of the building**B1 Use**

Once installed, the tiles do not require any energy or water to operate. The only maintenance required after installation is normal cleaning. For this reason, only the environmental burdens attributable to the maintenance of the product (module B2) are considered.

B2 Maintenance

Cleaning is carried out using a damp cloth and cleaning agents.

B2 Maintenance

Scenario information	Unit (expressed per functional unit)
Maintenance process	According to RCP for ceramic tiles (EN17160) residential floor cleaning scenario
Maintenance cycle	Wash once a week with water and detergent.
Auxiliary materials for maintenance (e.g. cleaning products) (specify each material)	Detergent: 1.34E-04 kg/m ² per wash
Material wastage during maintenance (specify type))	Not applicable
Net tap water consumption	0.1 l/m ² per wash
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

Ceramic tiles do not require repair, replacement or refurbishment, and their potential impact is not significant.

4.5. Use linked to the operation of the building**B6-B7 Energy and water use for operation**

These modules are not relevant for ceramic tiles.

4.6. End-of-life stage**C1 Deconstruction and demolition**

As there are no gripping materials, it is removed manually and does not involve any associated impact.

C2 Transport

All waste from the product is transported 50 km by lorry for disposal, either through reuse, disposal in inert waste sites, or recycling.

C3 Waste management for reuse, recovery and recycling

It has been estimated that 70 % of the parts are reused or recycled. Of this, 55 % is reused, whilst 15 % consists of waste generated during the reuse process; the remaining quantity is utilised as fill material, as indicated in the PCR.

C4 Final disposal

It was assumed that 30% of the product was sent to controlled landfills after its service life had ended.

End of life

Parameter	Unit (expressed per functional unit)
Collection process, specified by type	39.76 kg total
Recovery system, specified by type	21.87 kg for reuse 5.96 kg for recycling
Disposal, specified by type	11.93 kg to landfill
Assumptions for scenario development (e.g.: transport)	- Euro 6 compliant heavy-duty truck (27 t) - Distance of 50km (100% empty return).

4.7. Benefits and burdens beyond the system

Module D

The net environmental burdens and net benefits of obtaining the secondary material from waste at the installation stage and at the end of life of the product have been considered, including the reuse (one reuse cycle) of the tiles, made possible by the absence of bonding material, and their recycling as fill material.

5. Declaration of the environmental parameters of the LCA and the ICV

Environmental impacts

The estimated impact results are relative and do not indicate the final value of the impact categories, nor do they refer to threshold values, safety margins or risks.

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq	1.76E+01	2.58E+00	4.86E+00	0.00E+00	8.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E-01	8.50E-03	2.13E-01	-5.71E+00
GWP-fossil	kg CO ₂ eq	1.88E+01	2.54E+00	3.50E+00	0.00E+00	7.90E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-01	8.49E-03	2.10E-01	-6.07E+00
GWP-biogenic	kg CO ₂ eq	-1.22E+00	1.36E-04	1.34E+00	0.00E+00	1.55E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.84E-06	2.17E-03	3.70E-01
GWP-luluc	kg CO ₂ eq	1.91E-02	3.68E-02	9.16E-03	0.00E+00	3.18E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.74E-03	1.11E-06	9.13E-04	-6.66E-03
ODP	kg CFC11 eq	4.58E-08	3.51E-13	6.87E-09	0.00E+00	2.91E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.53E-14	2.96E-14	1.21E-13	-2.19E-08
AP	mol H ⁺ eq	3.19E-02	7.27E-03	6.30E-03	0.00E+00	2.62E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-04	1.09E-05	1.56E-03	-1.08E-02
EP-freshwater	kg P eq	2.18E-04	9.39E-06	3.72E-05	0.00E+00	2.01E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.43E-07	1.07E-09	4.48E-06	-6.96E-05
EP-marine	kg N eq	9.13E-03	1.99E-03	1.82E-03	0.00E+00	5.85E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.17E-05	3.05E-06	4.29E-04	-3.15E-03
EP-terrestrial	mol N eq	1.00E-01	2.26E-02	2.00E-02	0.00E+00	6.04E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.94E-04	3.31E-05	4.58E-03	-3.46E-02
POCP	Kg NMVOC eq	2.92E-02	6.03E-03	5.70E-03	0.00E+00	1.61E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.35E-04	9.73E-06	1.25E-03	-9.85E-03
ADP-minerals& metals ²	kg Sb eq	4.51E-05	1.96E-07	6.81E-06	0.00E+00	1.15E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.04E-09	5.68E-10	2.17E-08	-1.38E-05
ADP-fossil ²	MJ	3.17E+02	3.07E+01	5.33E+01	0.00E+00	1.36E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E+00	2.09E-01	2.82E+00	-1.02E+02
WDP ²	m ³	4.16E+00	3.42E-02	6.59E-01	0.00E+00	5.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.61E-03	2.95E-03	1.61E-02	-1.22E+00

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. NR: Not relevant.

Additional environmental impacts

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Incidence of diseases	9.48E-07	1.14E-07	1.64E-07	0.00E+00	1.46E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.27E-09	1.02E-10	1.90E-08	-2.93E-07
IRP ¹	kBq U235 eq	7.74E-01	7.86E-03	1.19E-01	0.00E+00	9.13E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.61E-04	2.17E-03	3.72E-03	-2.53E-01
ETP-fw ²	CTUe	7.22E+01	2.28E+01	1.50E+01	0.00E+00	1.88E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E+00	3.26E-02	1.70E+00	-2.45E+01
HTP-c ²	CTUh	2.35E-08	4.54E-10	3.65E-09	0.00E+00	1.10E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.05E-11	1.22E-12	2.16E-10	-7.13E-09
HTP-nc ²	CTUh	2.31E-06	1.98E-08	3.54E-07	0.00E+00	1.21E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.19E-10	1.24E-11	2.29E-08	-7.01E-07
SQP ²	-	1.97E+02	1.42E+01	3.21E+01	0.00E+00	3.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.72E-01	5.09E-04	6.61E-01	-6.33E+01

PM: Potential for disease incidence due to emissions of particulate matter (PM); IRP : Exposure efficiency of human potential relative to U235; ETP-fw : Ecosystem toxic unit comparative potential - freshwater; HTP-c : Ecosystem toxic unit comparative potential - carcinogenic effects; HTP-nc : Ecosystem toxic unit comparative potential - non-carcinogenic effects; SQP : Soil quality potential index; NR: Not relevant

Note 1: This impact category deals mainly with potential impacts of low doses of ionising radiation on human health from the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents or occupational exposure due to disposal of radioactive waste in underground facilities. Ionising radiation potential of soil, due to radon or some building materials is also not measured by this parameter.

Note 2: The results of this environmental impact indicator should be used with caution, as the uncertainties of the results are high and experience with this parameter is limited.

Use of resources

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	7.85E+01	2.50E+00	1.27E-01	0.00E+00	1.86E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E-01	1.38E-02	3.28E-01	-2.74E+01
PERM	MJ	1.22E+01	0.00E+00	1.83E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.69E+00
PERT	MJ	9.07E+01	2.50E+00	1.96E+00	0.00E+00	1.86E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E-01	1.38E-02	3.28E-01	-3.11E+01
PENRE	MJ	3.17E+02	3.07E+01	1.08E+00	0.00E+00	1.36E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E+00	2.09E-01	2.82E+00	-1.02E+02
PENRM	MJ	2.09E+00	0.00E+00	3.13E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-6.31E-01
PENRT	MJ	3.20E+02	3.07E+01	1.39E+00	0.00E+00	1.36E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E+00	2.09E-01	2.82E+00	-1.02E+02
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m3	8.67E-02	2.78E-03	1.42E-02	0.00E+00	6.79E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.31E-04	3.86E-05	5.36E-04	-2.91E-02

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.

Waste categories

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	4.41E-06	1.18E-09	6.69E-07	0.00E+00	3.89E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.23E-11	4.18E-11	4.45E-08	-1.61E-06
NHWD	kg	8.33E-01	4.85E-03	2.19E+00	0.00E+00	1.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.23E-04	2.56E-05	1.19E+01	-9.19E-01
RWD	kg	1.02E-02	5.45E-05	1.55E-03	0.00E+00	1.80E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.49E-06	3.39E-05	3.85E-05	-3.59E-03

HWD: Hazardous waste disposed of; **NHWD:** Non-hazardous waste disposed of; **RWD:** Radioactive waste disposed of; **NR:** Not relevant.

Output flows

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
CRU	kg	0,00E+00	0,00E+00	1,48E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,19E+01	0,00E+00	-4,49E-03
MFR	kg	7,32E-02	0,00E+00	4,64E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,96E+00	0,00E+00	-1,43E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

CRU: Components for reuse; **MFR:** Materials for recycling; **MER:** Materials for energy recovery; **EE:** Energy exported; **NR:** Not relevant.

6. Additional Environmental Information

Indoor air emissions

Ceramic tiles undergo a thermal process exceeding 1000°C during their manufacture. At these temperatures, any organic compounds present in the composition decompose, resulting in an inert end product free of volatile organic compounds that could be emitted during use.

The PAMESA Industrial Group has FloorScore® certification with registration number SCS-FS-06088 for indoor air quality in accordance with CDPH/EHLB Standard Method v1.2-2017 (California Section 01350), effective 1 April 2017, for school classroom and private office parameters when modelled as flooring.

The concentration of volatile organic compounds (TVOC) is less than or equal to 0.5 mg/m³ in accordance with the CDPH/EHLB v1.2-2017 standard method.

Release to soil and water

Ceramic tiles do not emit any compounds into the soil or water during the use phase, as it is a totally inert product, which does not undergo physical, chemical or biological transformations, is not soluble or combustible, does not react physically, chemically or in any other way, is not biodegradable, does not adversely affect other materials with which it comes into contact in a way that could lead to environmental pollution or harm human health. It is a non-leaching product and therefore does not pose a risk to surface or groundwater quality

Environmental information about the company

The spray-dried granules used in the manufacture of extra-thick porcelain stoneware (Bla 20 mm) (BPN porcelain atomisation) have the radioactive isotope activity concentration indices defined by the European Union (IUE), as well as the limits set out in standard GB6566-2010 in force in the Republic of China (I_{INT}, I_{EXT}).

PAMESA's manufacturing companies are members of ECOEMBES, a non-profit organisation that manages the recycling of waste deposited in yellow and blue bins.

ISO 14021 certification of recycled content for different spray-dried granules with inventory data from 2023.

Arcillas Atomizadas

Minimum recycled material content in c white pulp powder: 7.2%

% waste recycling in the spray-dried white pulp powder manufacturing process: 24.1%

TAU Porcelánico

Minimum recycled material content in BPN spray-dried powder: 7%

% waste recycling in the BPN spray-dried powder manufacturing process: 14.2%

Furthermore, PAMESA CERAMICA COMPACTTO complies with the requirements established by the ISO 17889-1:2021 standard for porcelain stoneware ceramic tiles. It complies with the mandatory requirements and has obtained an Sr=122.8 classification in the voluntary requirements.

Annex I. Declaration of the environmental parameters of the LCA and LCI for the format with MINIMUM impacts

Environmental impacts

The estimated impact results are relative and do not indicate the final value of the impact categories, nor do they refer to threshold values, safety margins or risks.

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq	1.75E+01	2.56E+00	4.84E+00	0.00E+00	8.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-01	8.45E-03	2.12E-01	-5.68E+00
GWP-fossil	kg CO ₂ eq	1.87E+01	2.53E+00	3.49E+00	0.00E+00	7.90E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-01	8.45E-03	2.08E-01	-6.04E+00
GWP-biogenic	kg CO ₂ eq	-1.22E+00	1.36E-04	1.34E+00	0.00E+00	1.55E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.81E-06	2.16E-03	3.70E-01
GWP-luluc	kg CO ₂ eq	1.90E-02	3.67E-02	9.12E-03	0.00E+00	3.18E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.73E-03	1.10E-06	9.08E-04	-6.63E-03
GWP-total	kg CO ₂ eq	4.57E-08	3.49E-13	6.86E-09	0.00E+00	2.91E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.52E-14	2.95E-14	1.20E-13	-2.18E-08
ODP	kg CFC11 eq	3.18E-02	7.23E-03	6.28E-03	0.00E+00	2.62E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-04	1.09E-05	1.55E-03	-1.08E-02
AP	mol H ⁺ eq	2.18E-04	9.35E-06	3.71E-05	0.00E+00	2.01E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.41E-07	1.07E-09	4.45E-06	-6.95E-05
EP-freshwater	kg P eq	9.10E-03	1.98E-03	1.81E-03	0.00E+00	5.85E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.15E-05	3.04E-06	4.27E-04	-3.14E-03
EP-marine	kg N eq	1.00E-01	2.25E-02	1.99E-02	0.00E+00	6.04E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.92E-04	3.30E-05	4.55E-03	-3.45E-02
EP-terrestrial	mol N eq	2.91E-02	6.00E-03	5.68E-03	0.00E+00	1.61E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.34E-04	9.68E-06	1.25E-03	-9.82E-03
POCP	Kg NMVOC eq	4.51E-05	1.95E-07	6.81E-06	0.00E+00	1.15E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.99E-09	5.65E-10	2.16E-08	-1.38E-05
ADP-minerals&metals ²	kg Sb eq	3.16E+02	3.06E+01	5.31E+01	0.00E+00	1.36E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.36E+00	2.08E-01	2.80E+00	-1.01E+02
ADP-fossil ²	MJ	4.14E+00	3.40E-02	6.57E-01	0.00E+00	5.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.60E-03	2.94E-03	1.60E-02	-1.22E+00
WDP ²	m ³	1.75E+01	2.56E+00	4.84E+00	0.00E+00	8.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-01	8.45E-03	2.12E-01	-5.68E+00

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. NR: Not relevant.

Additional environmental impacts

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Incidence of diseases	9.47E-07	1.13E-07	1.63E-07	0.00E+00	1.46E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E-09	1.01E-10	1.89E-08	-2.92E-07
IRP ¹	kBq U235 eq	7.72E-01	7.82E-03	1.18E-01	0.00E+00	9.13E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.59E-04	2.16E-03	3.70E-03	-2.52E-01
ETP-fw ²	CTUe	7.20E+01	2.27E+01	1.50E+01	0.00E+00	1.88E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E+00	3.24E-02	1.69E+00	-2.44E+01
HTP-c ²	CTUh	2.35E-08	4.51E-10	3.64E-09	0.00E+00	1.10E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.04E-11	1.22E-12	2.15E-10	-7.13E-09
HTP-nc ²	CTUh	2.31E-06	1.97E-08	3.54E-07	0.00E+00	1.21E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.14E-10	1.24E-11	2.27E-08	-7.01E-07
SQP ²	-	1.97E+02	1.41E+01	3.21E+01	0.00E+00	3.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.69E-01	5.06E-04	6.58E-01	-6.32E+01

PM: Potential for disease incidence due to emissions of particulate matter (PM); IRP : Exposure efficiency of human potential relative to U235; ETP-fw : Ecosystem toxic unit comparative potential - freshwater; HTP-c : Ecosystem toxic unit comparative potential - carcinogenic effects; HTP-nc : Ecosystem toxic unit comparative potential - non-carcinogenic effects; SQP : Soil quality potential index

Note 1: This impact category deals mainly with potential impacts of low doses of ionising radiation on human health from the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents or occupational exposure due to disposal of radioactive waste in underground facilities. Ionising radiation potential of soil, due to radon or some building materials is also not measured by this parameter.

Note 2: The results of this environmental impact indicator should be used with caution, as the uncertainties of the results are high and experience with this parameter is limited.

Use of resources

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	7.83E+01	2.48E+00	1.26E-01	0.00E+00	1.86E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E-01	1.37E-02	3.26E-01	-2.74E+01
PERM	MJ	1.22E+01	0.00E+00	1.83E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.69E+00
PERT	MJ	9.05E+01	2.48E+00	1.96E+00	0.00E+00	1.86E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E-01	1.37E-02	3.26E-01	-3.10E+01
PENRE	MJ	3.16E+02	3.06E+01	1.08E+00	0.00E+00	1.36E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.36E+00	2.08E-01	2.80E+00	-1.01E+02
PENRM	MJ	2.09E+00	0.00E+00	3.13E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-6.31E-01
PENRT	MJ	3.18E+02	3.06E+01	1.39E+00	0.00E+00	1.36E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.36E+00	2.08E-01	2.80E+00	-1.02E+02
SM	kg	2.91E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	8.64E-02	2.77E-03	1.41E-02	0.00E+00	6.79E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.30E-04	3.84E-05	5.33E-04	-2.90E-02

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.

Waste categories

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	4.41E-06	1.18E-09	6.69E-07	0.00E+00	3.89E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.21E-11	4.16E-11	4.43E-08	-1.40E-06
NHWD	kg	8.29E-01	4.82E-03	2.18E+00	0.00E+00	1.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.22E-04	2.55E-05	1.17E+01	-2.53E-01
RWD	kg	1.02E-02	5.42E-05	1.54E-03	0.00E+00	1.80E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.48E-06	3.37E-05	3.83E-05	-3.09E-03

HWD: Hazardous waste disposed of; **NHWD:** Non-hazardous waste disposed of; **RWD:** Radioactive waste disposed of; **NR:** Not relevant

Output flows

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
CRU	kg	0.00E+00	0.00E+00	1.19E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.15E+01	0.00E+00	0.00E+00
MFR	kg	7.32E-02	0.00E+00	4.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.87E+00	0.00E+00	-3.59E-02
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU: Components for reuse; **MFR:** Materials for recycling; **MER:** Materials for energy recovery; **EE:** Energy exported

Annex II. Declaration of the environmental parameters of the LCA and LCI for the format with MAXIMUM impact

Environmental impacts

The estimated impact results are relative and do not indicate the final value of the impact categories, nor do they refer to threshold values, safety margins or risks.

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq	1.76E+01	2.58E+00	4.86E+00	0.00E+00	8.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E-01	8.52E-03	2.13E-01	-5.72E+00
GWP-fossil	kg CO ₂ eq	1.88E+01	2.55E+00	3.51E+00	0.00E+00	7.90E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-01	8.51E-03	2.10E-01	-6.08E+00
GWP-biogenic	kg CO ₂ eq	-1.22E+00	1.37E-04	1.34E+00	0.00E+00	1.55E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.85E-06	2.18E-03	3.70E-01
GWP-luluc	kg CO ₂ eq	1.92E-02	3.69E-02	9.18E-03	0.00E+00	3.18E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E-03	1.11E-06	9.15E-04	-6.68E-03
ODP	kg CFC11 eq	4.58E-08	3.52E-13	6.88E-09	0.00E+00	2.91E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.53E-14	2.97E-14	1.21E-13	-2.19E-08
AP	mol H ⁺ eq	3.19E-02	7.29E-03	6.31E-03	0.00E+00	2.62E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-04	1.10E-05	1.56E-03	-1.08E-02
EP-freshwater	kg P eq	2.18E-04	9.42E-06	3.72E-05	0.00E+00	2.01E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.44E-07	1.07E-09	4.49E-06	-6.97E-05
EP-marine	kg N eq	9.14E-03	2.00E-03	1.82E-03	0.00E+00	5.85E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.18E-05	3.06E-06	4.30E-04	-3.16E-03
EP-terrestrial	mol N eq	1.01E-01	2.26E-02	2.00E-02	0.00E+00	6.04E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.96E-04	3.32E-05	4.59E-03	-3.46E-02
POCP	Kg NMVOC eq	2.92E-02	6.04E-03	5.71E-03	0.00E+00	1.61E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.35E-04	9.75E-06	1.26E-03	-9.87E-03
ADP-minerals& metals ²	kg Sb eq	4.52E-05	1.96E-07	6.81E-06	0.00E+00	1.15E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.06E-09	5.69E-10	2.18E-08	-1.38E-05
ADP-fossil ²	MJ	3.18E+02	3.08E+01	5.34E+01	0.00E+00	1.36E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E+00	2.10E-01	2.82E+00	-1.02E+02
WDP ²	m ³	4.17E+00	3.43E-02	6.61E-01	0.00E+00	5.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.61E-03	2.96E-03	1.62E-02	-1.22E+00

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. NR: Not relevant.

Additional environmental impacts

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Incidence of diseases	9.49E-07	1.14E-07	1.64E-07	0.00E+00	1.46E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.27E-09	1.02E-10	1.90E-08	-2.93E-07
IRP ¹	kBq U235 eq	7.75E-01	7.88E-03	1.19E-01	0.00E+00	9.13E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.62E-04	2.17E-03	3.73E-03	-2.53E-01
ETP-fw ²	CTUe	7.22E+01	2.29E+01	1.50E+01	0.00E+00	1.88E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E+00	3.27E-02	1.71E+00	-2.45E+01
HTP-c ²	CTUh	2.36E-08	4.55E-10	3.65E-09	0.00E+00	1.10E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.05E-11	1.23E-12	2.16E-10	-7.13E-09
HTP-nc ²	CTUh	2.31E-06	1.98E-08	3.54E-07	0.00E+00	1.21E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.21E-10	1.25E-11	2.29E-08	-7.01E-07
SQP ²	-	1.97E+02	1.42E+01	3.21E+01	0.00E+00	3.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.74E-01	5.10E-04	6.63E-01	-6.33E+01

PM: Potential for disease incidence due to emissions of particulate matter (PM); IRP : Exposure efficiency of human potential relative to U235; ETP-fw : Ecosystem toxic unit comparative potential - freshwater; HTP-c : Ecosystem toxic unit comparative potential - carcinogenic effects; HTP-nc : Ecosystem toxic unit comparative potential - non-carcinogenic effects; SQP : Soil quality potential index

Note 1: This impact category deals mainly with potential impacts of low doses of ionising radiation on human health from the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents or occupational exposure due to disposal of radioactive waste in underground facilities. Ionising radiation potential of soil, due to radon or some building materials is also not measured by this parameter.

Note 2: The results of this environmental impact indicator should be used with caution, as the uncertainties of the results are high and experience with this parameter is limited.

Use of resources

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	7.86E+01	2.50E+00	1.27E-01	0.00E+00	1.86E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E-01	1.38E-02	3.29E-01	-2.74E+01
PERM	MJ	1.22E+01	0.00E+00	1.83E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.69E+00
PERT	MJ	9.08E+01	2.50E+00	1.96E+00	0.00E+00	1.86E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E-01	1.38E-02	3.29E-01	-3.11E+01
PENRE	MJ	3.18E+02	3.08E+01	1.08E+00	0.00E+00	1.36E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E+00	2.10E-01	2.82E+00	-1.02E+02
PENRM	MJ	2.09E+00	0.00E+00	3.13E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-6.31E-01
PENRT	MJ	3.20E+02	3.08E+01	1.40E+00	0.00E+00	1.36E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E+00	2.10E-01	2.82E+00	-1.02E+02
SM	kg	2.94E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-8.88E-01
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	8.68E-02	2.79E-03	1.42E-02	0.00E+00	6.79E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.31E-04	3.87E-05	5.37E-04	-2.92E-02

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.

Waste categories

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	4.41E-06	1.19E-09	6.69E-07	0.00E+00	3.89E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.25E-11	4.19E-11	4.46E-08	-1.40E-06
NHWD	kg	8.34E-01	4.86E-03	2.20E+00	0.00E+00	1.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.24E-04	2.57E-05	1.24E+01	-2.55E-01
RWD	kg	1.02E-02	5.46E-05	1.55E-03	0.00E+00	1.80E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.50E-06	3.40E-05	3.86E-05	-3.10E-03

HWD: Hazardous waste disposed of; **NHWD:** Non-hazardous waste disposed of; **RWD:** Radioactive waste disposed of

Output flows

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
CRU	kg	0.00E+00	0.00E+00	1.19E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E+01	0.00E+00	0.00E+00
MFR	kg	7.32E-02	0.00E+00	4.82E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.22E+00	0.00E+00	-2.21E-02
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU: Components for reuse; **MFR:** Materials for recycling; **MER:** Materials for energy recovery; **EE:** Energy exported

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