



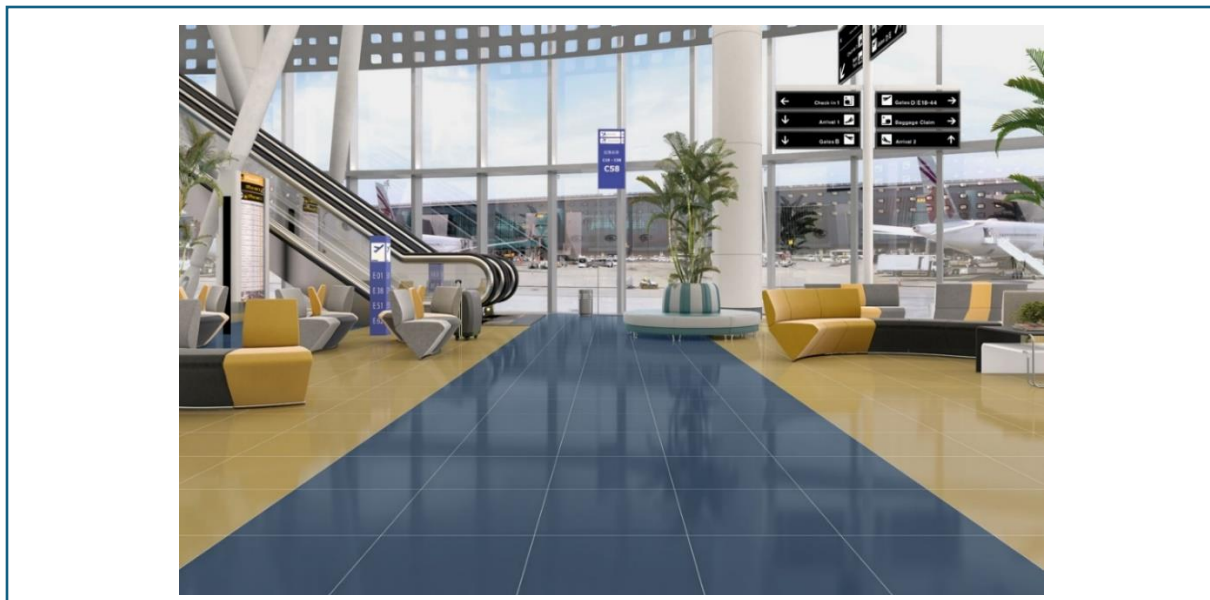
Declaration number: DAP 023:2026

PORCELAIN TILES (GROUP BIa) 7.50-12.00 MM

Issue date: 29/04/2026

Valid until: 31/12/2031

Pavigrés Cerâmicas, S.A.



PAVIGRÉS[®]
GRUPO

 Cluster Habitat
Sustentável

Version 1.7 Edition February 2026

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1. GENERAL INFORMATION

1.1. The DAPHabitat System

Programme operator:	Associação Plataforma para a Construção Sustentável www.clusterhabitat.pt geral@clusterhabitat.pt	 Cluster Habitat Sustentável
Address:	R. Coronel Veiga Simão, Ed. CTCV Lufapo Hub 3025-307 Coimbra	
Email address:	deptechnico@clusterhabitat.pt	
Telephone number:	(+351) 234 401 576	
Website:	www.daphabitat.pt	
Logo:		

1.2. EPD owner

Name of the owner:	Pavigrés Cerâmicas, S.A.	
Production site:	<ul style="list-style-type: none"> • Zona Industrial Almas das Domingas, 3780-244 Anadia, Portugal (Pavigrés) • Zona Industrial Almas das Domingas, 3780-244 Anadia, Portugal (Grespor) • Zona Industrial da Quinta, 3050-481 Mealhada, Portugal (Cerev) • Rua das Indústrias, 3770-904, Bustos, Portugal (Pavigrés II) 	
Address (head office):	Pavigrés Cerâmicas, S.A., Av. Alto das Domingas, 3780-244 - Aguim	
Telephone number:	(+351) 231 510 600	
Email address:	geral@pavigres.com	
Website:	https://pavigres.com/	
Logo:		
Information concerning the applicable management Systems:	ISO 9001:2015 – Quality Management Systems ISO 14001:2015 – Environmental Management Systems	
Specific aspects regarding production:	(CAE _{Rev.3} n.º 23312 – Manufacture of tiles, mosaics and ceramic plates)	
Organization's environmental policy:	PAVIGRÉS CERÂMICAS, S.A. is: <u>Mission:</u>	

Create and produce flooring and ceramic tiles that reinforce PAVIGRES prestige and trust in the global market, ensuring the Group's sustainability and development.

Policy:

PAVIGRÉS CERÂMICAS, S.A., assumes, as a fundamental vector for its success, the permanent focus on the Customer, demonstrated by the constant concern to anticipate and meet market expectations. Present global and integrated ceramic coating and flooring solutions, with products that stand out in the market due to their recognized quality and aesthetic value.

This Policy is aligned and developed in the following aspects:

Promote and encourage the continuous improvement of its Management System, in order to guarantee high levels of performance of its processes, products and services, with a view to meeting and exceeding the needs and expectations of customers, shareholders and other relevant stakeholders;

Provide the company with human resources, developing the skills of its employees, encouraging initiative, productivity and a responsible attitude in improving processes and procedures;

Comply with applicable compliance obligations, namely legal, regulatory, normative and others that PAVIGRÉS endorses as applicable;

Protect the Environment by promoting the prevention of pollution through the management of the consumption of natural water and energy resources and the implementation of good practices, namely, further the recovery of waste over its elimination, whenever possible, in order to allow continuous improvement of the environmental performance;

Provide the necessary resources and means to comply with the established Strategic Guidelines, creating conditions for possible investments in new projects focused on satisfying relevant stakeholders, in order to promote the financial consolidation of PAVIGRÉS.

The Management System Policy is thus adopted by PAVIGRÉS with LOYALTY, RIGOR, AND COMMITMENT, being communicated to all employees and disclosed to other interested parties, as appropriate.

1.3. Information concerning the EPD


Authors:	<ol style="list-style-type: none"> CTCV - Centro Tecnológico da Cerâmica e do Vidro PAVIGRÉS CERÂMICAS, S.A.
Contact of the authors:	<ol style="list-style-type: none"> CTCV materiais: habitat iParque Tecnológico de Coimbra – lote 6 3040-540 Antanhol – Portugal (T) + 351 239 499 200 Marisa almeida: marisa@ctcv.pt Pavigrés Cerâmicas, S.A., Av. Alto das Domingas, 3780-244 – Aguium (T) + 351 231 510 600 e-mail: ritatovim@pavigres.com
Issue date:	29/04/2026
Registration date:	26/06/2026
Registration number:	DAP023:2026
Valid until:	29/04/2031
Representativity of the EPD (location, manufacturer, group of manufacturers):	The DAP covers all porcelain tiles products in Group Bla, manufactured at the production facility owned by PAVIGRÉS CERÂMICAS, S.A.

Type of EPD	DAP from Cradle-to-grave and module D (A1-D)
Geographical representation	Portugal/Europe

1.4. Verification demonstration

External independent verification, accordingly, with the standard ISO 14025:2010 and EN 15804:2012+A2:2019	
Certification Body	Verifier
This EPD was validated based on FDES registry number 20251247728, verified by the INIES (France) verification program on 29/04/2026.	INIES Programme Verifier

1.5. EPD registration

Programme operator

(Associação Plataforma para a Construção Sustentável)

1.6. PCR (Product Category Rules) basic model

Name:	RCP Basic module for construction products and services
Issue date:	Edition Junho 2024
Number of registrations on the database:	RCP-mb001
Version:	Version 3.0
Identification and contact of the coordinator(s):	Marisa Almeida marisa@ctcv.pt Luís Arroja arroja@ua.pt José Dinis Silvestre jose.silvestre@ist.utl.pt

Identification and contact of the authors:	<p>Marisa Almeida marisa@ctcv.pt Luís Arroja arroja@ua.pt José Silvestre jds@civil.ist.utl.pt Fausto Freire Cristina Rocha Ana Paula Duarte Ana Cláudia Dias Helena Gervásio Victor Ferreira Ricardo Mateus António Baio Dias</p>
Composition of the Sectorial Panel:	-
Consultation period:	<p>18/11/2015 - 18/01/2016 12/08/2023 – 30/11/2023</p>
Valid until:	01/06/2027

CEN standard EN 15804 serves as the core Product Category Rules (PCR).

1.7. C-PCR (Complementary Product Category Rules)

Name:	<ol style="list-style-type: none"> RCP: Floor covering RCP: Wall covering EN 17160:2019 – Product Category Rules for Ceramic Tiles
Issue date:	<ol style="list-style-type: none"> 10/02/2014 10/02/201a 27/02/2019, in force since 15/04/2019
Number of registrations on the database:	<ol style="list-style-type: none"> RCP001:2014 RCP002:2014 --
Version:	<ol style="list-style-type: none"> Version 1.2 (june 2022) Version 1.2 (june 2022) --
Identification and contact of the coordinator(s):	<ol style="list-style-type: none"> RCP: Floor covering <ul style="list-style-type: none"> • Marisa Almeida marisa@ctcv.pt • Luís Arroja arroja@ua.pt RCP: Wall covering <ul style="list-style-type: none"> • Luís Arroja arroja@ua.pt • Marisa Almeida marisa@ctcv.pt
Identification and contact of the authors:	<ol style="list-style-type: none"> RCP: Floor covering <ul style="list-style-type: none"> • Marisa Almeida marisa@ctcv.pt • Luís Arroja arroja@ua.pt • Ana Cláudia Dias acdias@ua.pt

	<p>4. RCP: Wall covering</p> <ul style="list-style-type: none"> • Marisa Almeida marisa@ctcv.pt • Luís Arroja arroja@ua.pt • Ana Cláudia Dias acdias@ua.pt
Composition of the Sectorial Panel:	<p>1. RCP: Floor covering</p> <ul style="list-style-type: none"> • RMC – Revestimentos de Mármore Compactos, S.A. • Dominó – Indústrias Cerâmicas, S.A. • APICER – Associação Portuguesa da Indústria de Cerâmica • Sonae Indústria, SGPS, S.A. <p>2. RCP: Wall covering</p> <ul style="list-style-type: none"> • RMC – Revestimentos de Mármore Compactos, S.A. • Dominó – Indústrias Cerâmicas, S.A. • Sonae Indústria, SGPS, S.A. • APICER – Associação Portuguesa da Indústria de Cerâmica
Consultation period:	<p>1. 01/08/2013 – 30/11/2013</p> <p>2. 12/08/2013 – 30/11/2013</p> <p>3. 18/11/2015 – 18/01/2016</p>
Valid until:	<p>1. 01/06/2027</p> <p>2. 01/06/2027</p> <p>3. --</p>

1.8. Information concerning the produc/product class


Identification of the product:	Porcelain tiles for floor and wall coverings, with water absorption $E_b \leq 0,5\%$.
Illustration of the product:	
Brief description of the product:	<p>Porcelain tiles are used as floor and wall coverings, both indoors and outdoors, in residential and public areas. This product is impermeable and offers high mechanical resistance, with a wide range of aesthetic and dimensional options available on the market, particularly in terms of visual effects.</p> <p>In this EPD, the results are presented per unit area (1m^2) of the product (weighted average of 22.01 kg/m^2). However, the production process is the same regardless of the thickness or format of the products.</p>

Table 1: Technical characteristics of porcelain tiles - EN 14411: Group Bla

Parameters	Value	Test standard
Dimensional Characteristics	Linear dimensions $\pm 0.3\%$ Orthogonality $\pm 0.3\%$ Straightness $\pm 0.3\%$ Planarity $\pm 0.3\%$ Thickness $\pm 3\%$	EN ISO 10545-2
Water absorption	$\leq 0,1\%$	EN ISO 10545-3
Mechanical flexural strength (N)	$<7.5 \text{ N} \geq 1100$ $\geq 7.5 \text{ N} \geq 1500$	EN ISO 10545-4
Rupture modulus N/mm^2	$(\geq 45 \text{ n}/\text{mm}^2 \mid \geq 460 \text{ kg}/\text{cm}^2)$	
Linear thermal expansion ($\times 10^{-6} \text{K}^{-1}$)	≤ 7	EN ISO 10545-8
Thermal shock resistance	Resistant	EN ISO 10545-9
Cracking resistance	Guaranteed	EN ISO 10545-11
Resistance to household cleaning products and pool additives	Guaranteed	EN ISO 10545-13
Resistance to low/high concentration acids and bases	To be confirmed case by case	EN ISO 10545-13
Stain resistance	Guaranteed	EN ISO 10545-14

Main technical characteristics of the product:	
Description of the product's application/use:	<p>These products have a wide range of applications in civil construction, including:</p> <ul style="list-style-type: none"> - Floor coverings - Wall coverings - Interior cladding - Exterior cladding (facades) - Residential areas and buildings - Public spaces and buildings - Industrial areas and buildings
Placing on the market / Rules of application in the market / Technical rules of the product:	<p>EN 14411:2012 EN ISO 10545</p>
Quality control	In accordance with the product technical standards.
Special delivery conditions:	Not applicable.

The product does not contain any substances from the REACH candidate list of substances of very high concern in concentrations exceeding 0.1% by mass.

Table 2: Main components

Raw materials	Percentage	Quantity (Kg/m ²)
Ceramic body	97-99%	22.01
Others	1-3%	
Packaging	Percentage	
Wooden pallets	67%	0,3023
Cardboard	26%	0,1171
Others	7%	0,0301

Components and substances to declare:

Where explanatory material may be obtained:

<https://pavigres.com/>

History of the LCA studies:

- CTCV, 2019 (DapHabitat) (DAP n. ° 00000878)
- CTCV, 2022 (INIES, França) (FDES 20220730563)
- CTCV, 2024 (DapHabitat) (DAP n. ° 012 :2022)
- CTCV, 2026 (INIES, França) (FDES 20251247728)

1.9. Calculation rules of the LCA

Functional unit:

To cover and decorate 1m² of floors and walls, in indoor or outdoor environments, with a reference service life of 50 years, using porcelain tiles (group Bla) with an average thickness of 9.65 mm (7.50 mm – 12 mm), in accordance with the installation conditions.

System boundaries:

The type of Environmental Product Declaration (EPD) carried out is “cradle-to-grave” with module D (A1-D).

Criteria for the exclusion:

The Life Cycle Assessment (LCA) carried out considered the production processes of wooden pallets, auxiliary consumptions, and the energy used in the manufacture of porcelain tiles for which inventory data are available. It should be noted that the processes not considered fall within the exclusion criteria defined by standard NP EN 15804:2012+A2; the excluded data represent less than 1% of the total and 5% per module of the total mass and energy inputs. The principles of modularity and “polluter pays” were applied.

The following processes were excluded:

- Environmental costs associated with the construction and maintenance of infrastructure and equipment (capital goods)
- Long-term emissions

Assumption and limitations:

For processes over which the manufacturers have no influence or specific information, such as raw material extraction, generic data from the Ecoinvent v3.9.1 databases were used.

The datasets used to model electricity and natural gas production were adapted to the national context. The electricity mix was updated for the year 2022 using information from Rede Elétrica Nacional (REN), Entidade Reguladora dos Serviços Energéticos (ERSE), and Direção-Geral de Energia e Geologia (DGEG) in order to obtain more up-to-date results regarding the environmental impacts

	<p>generated by the electricity grid in Portugal. The natural gas process was modelled for 2022 according to the information provided in the Energy in Portugal report published by DGEG, concerning the countries of origin of imported natural gas.</p> <p>The environmental impacts indicated in this EPD are a weighted average of all ceramic tiles manufactured by Pavigrés in 2022.</p>
Quality and other characteristics about the information used in the LCA:	<p>The production data collected corresponds to the year 2022 and reflect actual operating conditions. The generic data used was obtained from the Ecoinvent v3.9.1 database and comply with the quality criteria (age, geographical and technological representativeness, coverage, plausibility, etc.) applicable to generic data.</p> <p>The LCA-based information and the additional information declared in this EPD are in accordance with the requirements of the applicable European and Portuguese Standards.</p>
Allocation rules:	<p>In this study, there are no co-products associated with the manufacturing process. However, glazed vitrified tiles (Blb) are also produced at the Pavigrés factory, and monoporosa ceramic wall tiles (BIII) are manufactured at the Cerev factory. At the Grespor and Pavigrés II production facilities, only porcelain tiles (Bla) are produced.</p> <p>For certain flows, allocation was established based on measurements carried out at the level of each production unit. For the remaining flows, mass allocation was applied.</p> <p>Energy consumption was allocated according to the type of parameters and the type of process.</p>
Software used for the assessment:	SimaPro 9.5
Background database used for the LCA:	Ecoinvent 3.9.1
Comparability of EPD for construction products:	The EPD of construction products and services cannot be comparable in case they are not produced according to EN 15804 and EN 15942 and according to the comparability conditions determined by ISO 14025.

1.10. Use of the average environmental performance

The porcelain tiles included in the study are manufactured using the same raw materials and auxiliary materials, the same energy resources, and the same technological process, and comprise different models with different formats. The thickness of the formats included within the scope of this EPD ranges on average from 7.50 to 12 mm, with an average mass of 22.01 kg/m².

1.11. Technical information for Reference Service Life (RSL)

The reference service life is 50 years, in accordance with Annex H of standard NF EN 15804+A2/CN and the core product standard EN 17160 (PCR for the ceramic coverings product category). The table below presents the description of the reference service life in accordance with standard EN 15804:2012+A2:2019+AC/2021.

Table 3: Description of the reference service life

Parameter	Results
Reference service life	50 years
Declared product properties (at the factory gate) and finishes, etc	Minimum values for the relevant characteristics, in accordance with Annex H of standard EN 14411. For further information, please contact a company representative.
Design application parameters (if instructed by the manufacturer), including references to appropriate practices and application codes	Product characteristics comply with standard EN 14411. NF P 61-204-1 - DTU52.2
Assumed workmanship quality, when installed in accordance with the manufacturer's instructions	NF P 61-204-1 - DTU52.2
Outdoor environment (for external applications), e.g. weathering, pollutants, UV exposure and wind, building orientation, shading, temperature	Not applicable.
Indoor environment (for internal applications), e.g. temperature, humidity, chemical exposure	In compliance with standard EN 14411. NF P 61-204-1/3 - DTU52.2
Conditions of use, e.g. frequency of use, chemical exposure	In compliance with standard EN 14411. NF P 61-204-1 - DTU52.2
Maintenance, e.g. frequency of cleaning, mechanical exposure	Values of the relevant characteristics according to Annex H of EN 14411. Periodic cleaning with non-abrasive products. Cleaning of floors once a week.

1.12. Flow diagram of input and output of the process

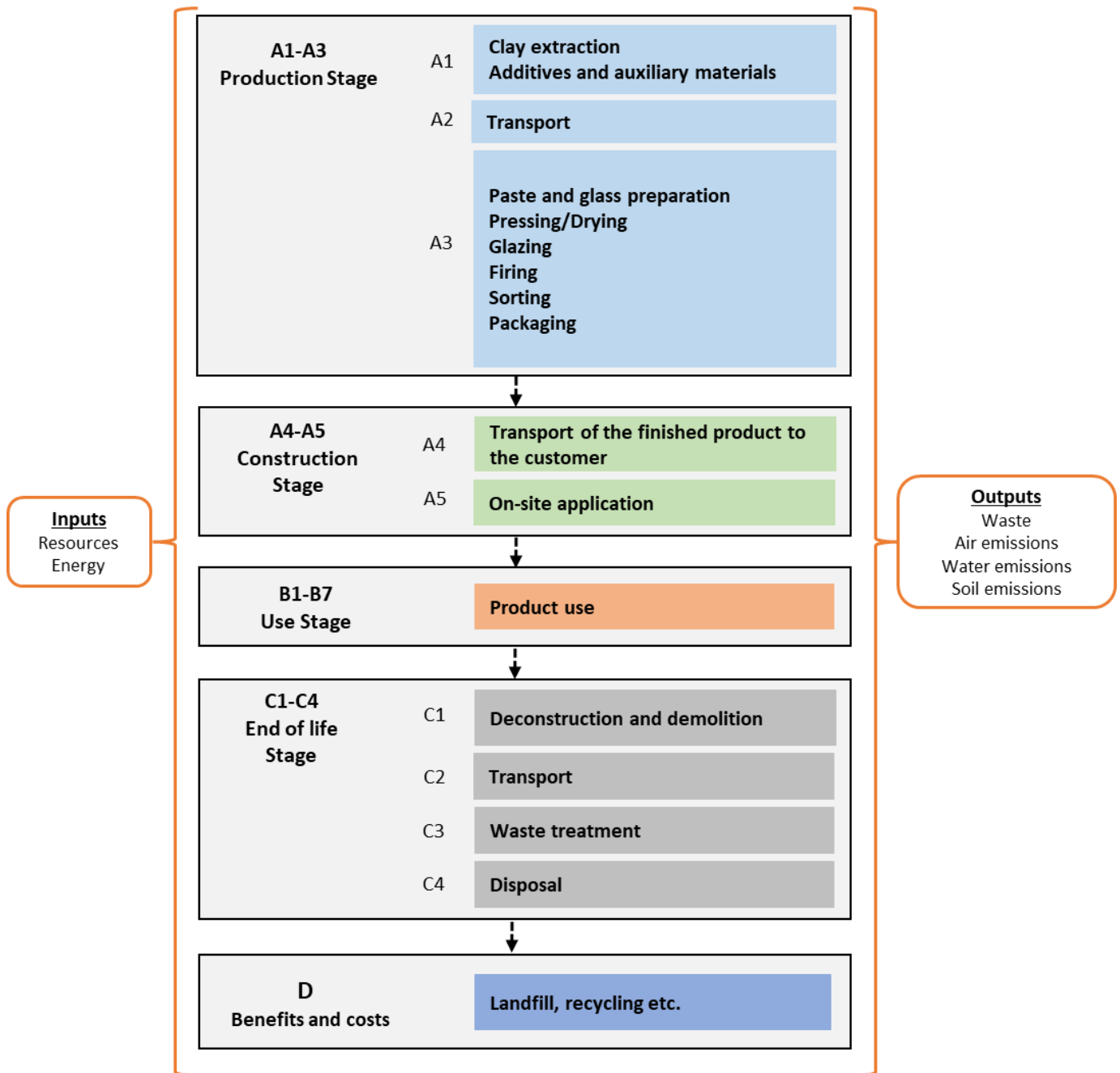


Figure 1: Example of the life cycle stages and unit processes of the product.

2. CORE ENVIRONMENTAL IMPACT INDICATORS

2.1. Description of the system boundaries

(✓ = included; ND = module not declared)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
Raw material supply	Transport	Manufacturing	Transport	Construction installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction and demolition	Transport	Waste processing	Disposal	Reuse, recovery, potential recycling
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Production stage, A1-A3

Stages A1 to A3 include the extraction of raw materials, their transport to the factory, and the manufacture of the product.

A1 – Extraction and processing of raw materials: this stage includes the extraction and possible processing of raw materials.

A2 – Transport: the raw materials and auxiliary materials are transported either by tanker truck or by a combination of tanker truck, ship, and tanker truck again.

A3 – Production: this stage includes design and development, storage of raw materials, body preparation, atomization, shaping (by pressing), drying, glazing or decoration, firing and sorting, subsequent treatment (e.g. polishing), packaging, and storage.

A Pavigrés Cerâmicas, SA. (at its Pavigrés, Grespor, Cerev and Pavigrés II facilities) is dedicated to the production of ceramic tiles (floor and wall tiles, in porcelain and non-porcelain stoneware, glazed and unglazed) by pressing atomized powder, followed by drying and firing. Natural raw materials, synthesized raw materials, and additives are used, the main ones being clays, feldspars, sands, carbonates, and kaolins.

Hard raw materials (sands, feldspars, etc.) undergo grinding, while clay-based materials undergo turbo-dispersion; they are then mixed and homogenized (storage and agitation), forming the final ceramic body composition.

The ceramic body in slurry form is subsequently atomized (sprayed and dried), forming the ceramic powder which, after homogenization, is pressed — shaping by pressing. The pressed green tiles undergo a rapid drying cycle to remove residual moisture and are finally glazed and subjected to the firing process — the operation that gives them all their final physico-chemical characteristics.

Construction stage, A4-A5

A4 includes transport from the production site to the flooring installation site. The scenario is based on a distance of 1399 km.

A5 corresponds to construction and installation in the building.

Use stage, B1-B7

B1 – Use or application of the installed product – the environmental impacts generated during the use stage are very low and may therefore be neglected, according to EN 17160:2019 concerning product category rules for ceramic tiles.

B2 – Maintenance– throughout its service life, the ceramic product should be cleaned regularly, to a greater or lesser extent depending on the type of building — residential, commercial, healthcare, etc. — in which it is installed. If the surface is dirty or greasy, cleaning agents such as detergents may be used. Therefore, water and detergent consumption may be considered.

Modules **B3, B4, B5, B6 and B7** are not applicable, according to EN 17160:2019 (PCR for ceramic tiles).

End of life stage, C1-C4

The end-of-life stage consists of the following modules:

C1- Deconstruction/demolition: This phase includes the dismantling or demolition of ceramic coverings, as well as the initial sorting of materials on the construction site.

C2 – Transport of waste: Waste resulting from demolition is transported from the place of generation to treatment facilities or final disposal sites.

C3- Waste processing for reuse, recovery and/or recycling: This stage includes the processes required to prepare waste after the end of the product's service life, such as sorting, cleaning, and other physical or mechanical treatments. The aim is to make the waste suitable for subsequent recycling or recovery.

C4 – Disposal - This stage considers the environmental impact associated with the disposal of waste that cannot be reused or recycled. Disposal is generally carried out through landfill, controlled incineration, or other suitable treatment methods.

A scenario 70% recycling (C3) and 30% landfill disposal (C4) was considered.

Table 4: End of life

Process	Units (expressed per functional unit of specified components, products or materials by material type)
Collection process specified by type	Collection with mixed construction waste: 22.01 kg (100%) of product + 3.3 kg mortar
Recovery system specified by type	0 kg intended for reuse 17.72 kg intended for recycling (70%) 0 kg intended for energy recovery
Disposal specified by type	7.59 kg of product intended for disposal (landfill) (30%)
Assumptions for scenario development (e.g. transport)	Transport distance: 30 km Transport by a 25 t payload EURO 6 truck

Benefits and costs, D

Module D includes the environmental benefits or burdens generated by reusable products, recyclable materials, and/or energy carriers leaving the product system.

It was considered that 54% (Pavigrés II) and 67% (Pavigrés, Cerev and Grespor) of the waste (ceramic tiles) is reused at the end of its service life.

2.1.1. Justification for the exemption to declare modules C and D

Not applicable.

2.2. Core environmental impact indicators

	Global warming potential - total;	Global warming potential fossil;	Global warming potential - biogenic;	Global warming potential land use and land use change;	Depletion potential of the stratospheric ozone layer;	Acidification potential;
	GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP
Unit	kg CO ₂ eq.	kg CO ₂ eq.	kg CO ₂ eq.	kg CO ₂ eq.	kg CFC 11 eq.	mol H ⁺ eq.
Modules A1-A3	1.23E+01	1.30E+01	-6.73E-01	2.08E-02	4.74E-07	3.28E-02
Module A4	4.62E+00	4.62E+00	1.40E-03	9.04E-05	9.98E-08	5.81E-03
Module A5	1.75E+00	1.07E+00	6.78E-01	7.48E-04	1.67E-08	2.87E-03
Module B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B2	5.42E-01	5.37E-01	5.14E-03	3.72E-04	4.08E-08	4.07E-03
Module B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C2	9.90E-02	9.90E-02	2.99E-05	1.94E-06	2.14E-09	1.25E-04
Module C3	1.18E-01	1.17E-01	9.59E-04	5.93E-05	1.94E-09	9.40E-04
Module C4	6.90E-02	6.89E-02	6.74E-05	1.24E-05	1.20E-09	5.39E-04
Module D	-2.22E-02	-2.07E-02	-1.49E-03	-6.60E-06	-3.29E-10	-1.57E-04

LEGEND:

	Product stage
	Construction process stage
	Use stage
	End of life stage
	Benefits and loads beyond the system boundary

NOTES: Units expressed by functional unit.

	Eutrophication potential aquatic freshwater;	Eutrophication potential aquatic marine;	Eutrophication potential terrestrial;	Formation potential of tropospheric ozone;	Abiotic depletion potential for non-fossil resources;	Abiotic depletion potential for fossil resources potential;	Water (user) deprivation potential;
	EP-freshwater	EP-marine	EP-terrestrial	POCP	ADP-minerals&metals	ADP-fossil	WDP
Unit	kg P eq.	kg N eq.	mol N eq.	Kg COVNM eq.	kg Sb eq.	MJ, P.C.I	m ³ eq. de água globalmente indisponível
Modules A1-A3	1.48E-04	1.06E-02	9.10E-02	3.91E-02	8.34E-04	1.92E+02	4.22E+00
Module A4	3.63E-06	1.44E-03	1.40E-02	1.08E-02	1.59E-07	6.14E+01	5.62E-02
Module A5	1.40E-05	9.05E-04	8.39E-03	2.83E-03	2.50E-05	9.07E+00	2.66E-01
Module B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B2	1.67E-05	4.93E-04	5.40E-03	2.27E-03	2.66E-07	1.84E+01	1.11E+01
Module B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C2	7.78E-08	3.09E-05	3.01E-04	2.32E-04	3.40E-09	1.32E+00	1.21E-03
Module C3	2.21E-06	4.03E-04	4.38E-03	1.30E-03	5.13E-09	1.74E+00	6.59E-03
Module C4	7.94E-08	2.50E-04	2.71E-03	8.11E-04	2.80E-09	9.12E-01	1.15E-03
Module D	-2.11E-07	-6.86E-05	-7.51E-04	-2.30E-04	-1.06E-08	-4.35E-01	-7.59E-03

LEGEND:

	Product stage
	Construction process stage
	Use stage
	End of life stage
	Benefits and loads beyond the system boundary

2.3. Additional environmental impact indicators

	Potential incidence of disease due to PM emissions	Potential Human exposure efficiency relative to U235	Potential Comparative Toxic Unit for ecosystems	Potential Comparative Toxic Unit for humans, cancer effects	Potential Comparative Toxic Unit for humans, not cancer effects	Potential soil quality index
	PM	IRP	ETP-fw	HTP-c	HTP-nc	SQP
Unit	Incidência de doença	kBq U 235 eq.	CTUe	CTUh	CTUh	-
Modules A1-A3	4.23E-07	2.56E-01	3.74E+01	4.98E-09	8.24E-08	4.55E+02
Module A4	2.78E-07	9.77E-03	2.73E+01	2.86E-10	3.18E-08	1.17E-01
Module A5	3.52E-08	2.46E-02	2.63E+00	2.68E-10	5.90E-09	1.81E+01
Module B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B2	3.80E-08	1.41E-02	1.30E+00	8.65E-10	1.70E-08	8.31E-01
Module B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C2	5.96E-09	2.09E-04	5.84E-01	6.14E-12	6.81E-10	2.50E-03
Module C3	1.55E-07	4.57E-03	6.38E-01	1.08E-11	3.93E-10	5.32E-01
Module C4	7.11E-08	1.80E-04	4.36E-01	6.73E-12	2.66E-10	3.23E-01
Module D	-4.88E-09	-4.72E-03	-1.25E-01	-1.37E-11	-8.46E-11	-2.40E+00

LEGEND:

	Product stage
	Construction process stage
	Use stage
	End of life stage
	Benefits and loads beyond the system boundary

2.4. Indicators describing resource use

Unit	Primary energy					
	EPR	RR	TRR	EPNR	RNR	TRNR
	MJ, P.C.I.	MJ, P.C.I.	MJ, P.C.I.	MJ, P.C.I.	MJ, P.C.I.	MJ, P.C.I.
Modules A1-A3	2.09E+01	5.14E+00	2.60E+01	1.91E+02	8.77E-01	1.92E+02
Module A4	8.70E-02	0.00E+00	8.70E-02	6.28E+01	0.00E+00	6.28E+01
Module A5	1.55E+00	2.19E-01	1.76E+00	9.66E+00	0.00E+00	9.66E+00
Module B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B2	4.39E-01	0.00E+00	4.39E-01	1.97E+01	0.00E+00	1.97E+01
Module B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C2	1.87E-03	0.00E+00	1.87E-03	1.35E+00	0.00E+00	1.35E+00
Module C3	9.56E-02	0.00E+00	9.56E-02	1.84E+00	0.00E+00	1.84E+00
Module C4	1.50E-02	0.00E+00	1.50E-02	9.70E-01	0.00E+00	9.70E-01
Module D	-2.04E-01	0.00E+00	-2.04E-01	-5.17E-01	0.00E+00	-5.17E-01

LEGEND:

	Product stage
	Construction process stage
	Use stage
	End of life stage
	Benefits and loads beyond the system boundary

Secondary materials and fuels, and use of water				
	MS	CSR	CSNR	Net use of fresh water
Unit	kg	MJ, P.C.I.	MJ, P.C.I.	m ³
Modules A1-A3	8.14E-01	0.00E+00	0.00E+00	9.84E-02
Module A4	0.00E+00	0.00E+00	0.00E+00	1.17E-03
Module A5	0.00E+00	0.00E+00	0.00E+00	6.22E-03
Module B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B2	0.00E+00	0.00E+00	0.00E+00	2.69E-01
Module B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C2	0.00E+00	0.00E+00	0.00E+00	2.51E-05
Module C3	0.00E+00	0.00E+00	0.00E+00	4.50E-04
Module C4	0.00E+00	0.00E+00	0.00E+00	5.01E-05
Module D	0.00E+00	0.00E+00	0.00E+00	-4.08E-03


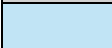


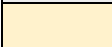
LEGEND:

	Product stage
	Construction process stage
	Use stage
	End of life stage
	Benefits and loads beyond the system boundary

2.5. Other environmental information describing different waste categories

	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed
Unit	kg	kg	kg
Modules A1-A3	3.15E-03	2.10E+00	2.63E-04
Module A4	1.57E-04	2.47E-03	4.29E-04
Module A5	9.87E-05	2.62E-01	2.96E-05
Module B1	0.00E+00	0.00E+00	0.00E+00
Module B2	9.78E-06	1.78E-02	1.54E-05
Module B3	0.00E+00	0.00E+00	0.00E+00
Module B4	0.00E+00	0.00E+00	0.00E+00
Module B5	0.00E+00	0.00E+00	0.00E+00
Module B6	0.00E+00	0.00E+00	0.00E+00
Module B7	0.00E+00	0.00E+00	0.00E+00
Module C1	0.00E+00	0.00E+00	0.00E+00
Module C2	3.36E-06	5.30E-05	9.20E-06
Module C3	3.30E-06	2.69E+00	1.24E-05
Module C4	6.03E-06	7.61E+00	1.07E-07
Module D	-1.71E-05	-5.64E-04	-2.05E-05

LEGEND:

	Product stage
	Construction process stage
	Use stage
	End of life stage
	Benefits and loads beyond the system boundary

2.6. Environmental information describing output flows

Unit	Components for re-use	Materials for recycling	Materials for energy recovery	Exported energy
	kg	kg	kg	Energy carrier MJ
Modules A1-A3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module A5	0.00E+00	7.12E-01	8.85E-02	9.21E-01
Module B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C3	0.00E+00	1.78E+01	0.00E+00	0.00E+00
Module C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module D	0.00E+00	0.00E+00	0.00E+00	0.00E+00

LEGEND:

	Product stage
	Construction process stage
	Use stage
	End of life stage
	Benefits and loads beyond the system boundary

2.7. Information describing the biogenic carbon content at the factory gate

Biogenic carbon content*	Units**	Modules A1-A3 (results)
Biogenic carbon content in product	Kg C	0
Biogenic carbon content in accompanying packaging	Kg C	1.76E-01

* 1 kg biogenic carbon is equivalent to 44/12 kg of CO₂.

** This information can be omitted whenever the content of biogenic carbon in the product, or in the respective packaging, is less than 5% of the mass of the product, or the respective packaging.

3. SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

3.1. Module A4 Transport to the building site – Construction process stage

Destination	Type of transport	Average distance (km)
Europe	Truck with a 25-tonne capacity	1399

3.2. Module A5 Installation of the product in the building – Construction process stage

Scenario information	Units (expressed per functional unit)	
Auxiliary inputs for installation (specified by material)	3.3 kg of adhesive mortar for the installation of porcelain tiles – Group Bla.	
Water use	0.8 dm ³	
Use of other resources	Not applicable.	
Quantitative description of energy type (regional mix) and consumption during the installation process	-	
Waste generated on the construction site before treatment of waste generated by product installation (specified by type)		Bla
	Waste rate	3%
	Ceramic waste	672.8 g
	Cardboard	131.6 g
	PE film	34.9 g
	Pallets	363 g
Materials (specified by type) produced by waste processing on the construction site, e.g. collection for recycling, energy recovery, disposal (specified by method)		Bla
	Recycled ceramic waste	471 g
	Ceramic waste to landfill	201.9 g
	Incinerated cardboard	6.6 g
	Recycled cardboard	115.8 g
	Cardboard to landfill	9.2 g
	Incinerated PE film	16.8 g
	Recycled PE film	9.1 g
	PE film to landfill	9.1 g
	Incinerated wood	72.6 g
	Recycled wood	137.9 g
	Wood to landfill	152.5 g
Direct emissions to ambient air, soil and water	-	

3.3. Module B1 - Use stage

The environmental impacts generated during the use phase are very low and may therefore be neglected, according to EN 17160:2019 concerning product category rules for ceramic tiles.

3.4. Module B2 - Maintenance

Ceramic floor and wall covering products must be cleaned regularly depending on the type of building: residential, commercial, or healthcare. Water consumption and cleaning agents were taken into account. The values declared for this stage refer to a 50-year period. The maintenance scenario for ceramic floor and wall coverings was conservative and in accordance with EN 17160:2019.

The scenario used for the maintenance of ceramic flooring considered residential use, with the use of 0.134 ml of detergent and 0.1 l of water to clean 1m² of porcelain tiles once a week.

3.5. Module B3 - Repair

This module is not relevant for ceramic tiles according to EN 17160:2019.

3.6. Module B4 – Replacement

This module is not relevant for ceramic tiles according to EN 17160:2019.

3.7. Module B5 - Refurbishment

This module is not relevant for ceramic tiles according to EN 17160:2019.

3.8. Module B6 - Energy usage (operational)

This module is not relevant for ceramic tiles according to EN 17160:2019.

3.9. Module B7 - Water usage (operational)

This module is not relevant for ceramic tiles according to EN 17160:2019.

3.10. Modulo C1 - Demolition – End-of-Life Stage

This module is not relevant for ceramic tiles according to EN 17160:2019.

3.11. Modulo C2 - Transportation – End-of-Life Stage

According to EN 17160:2019 concerning product category rules for ceramic tiles, an average distance of 30 km was considered.

3.12. Module C3 - Waste processing for reuse, recovery, and recycling – End-of-Life Stage

Destination	Result	Unit of measurement
Recycling (C3)	70	%

3.13. Module C4 - Waste disposal – End-of-Life Stage

Destination	Result	Unit of measurement
Landfill (C4)	30	%

3.14. Scenarios and technical information for module D

After the demolition/deconstruction phase, ceramic tiles may be crushed and used in a variety of different applications:

- As aggregates for road construction bases;
- In concrete aggregates;
- When ceramic tiles are crushed, they form recycled ceramic aggregates that may be incorporated as a partial substitute for natural aggregates in hot mix asphalt;
- Recycled ceramic aggregates may be used in landfill construction;
- Recycled ceramic aggregates may be used in the construction of base and sub-base layers for secondary roads.

A value of 54% (Pavigrés II) and 67% (Pavigrés, Cerev and Grespor) was considered for porcelain tiles (considering C3 and EN 15804+A2).

3.15. Additional environmental information regarding the release of hazardous substances into air, soil, and water during the use stage

The product is classified as A+. Source: self-declaration Pavigrés, S.A. and the Cerame-Unie guide.

These products do not contain hazardous substances included in the REACH Regulation candidate lists above the declarative threshold of 0.1%.

4. REFERENCES

- ✓ Instruções Gerais do Sistema DAPHabitat, Versão 3.0, june 2024 (em www.daphabitat.pt);
- ✓ RCP – modelo base para produtos e serviços de construção. Sistema DAPHabitat. Versão 3.0, june 2024 (em www.daphabitat.pt);
- ✓ NP ISO 14025:2009 Rótulos e declarações ambientais – Declarações ambientais Tipo III – Princípios e procedimentos;
- ✓ EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products;
- ✓ EN 15942:2021 Sustainability of construction works – Environmental product declarations – Communication format business-to-business.
- ✓ Diretrizes ECO Platform. 2024.
- ✓ Almeida. M. (2019). Desempenho Ambiental de produtos no setor cerâmico em Portugal. Doctoral thesis. University of Aveiro
- ✓ EN 17160:2019 – “Product category rules for ceramic tiles”
- ✓ EN 14411:2012. Ceramic tiles — Definitions, classification, characteristics, and marking. Brussels, Belgium
- ✓ Base de dados do Ecoinvent v.3.9.1 (2024). (www.ecoinvent.org);