DAPHabitat System

Environmental Product Declaration

www.daphabitat.pt

[according to ISO 14025, EN 15804:2012+A2:2019 e EN 15942]

Declaration number: DAP 025:2026

CERAMIC WALL TILES – MONOPOROUS (GROUP BIII) 6.50-10.50 MM

ssue date: 07/04/2026 **Valid until:** 31/12/2031

Pavigrés Cerâmicas, S.A.

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:	deptecnico@clusterhabitat.pt
Telephone number:	(+351) 234 401 576
Website:	www.daphabitat.pt
Logo:	dap habitat

1.2. EPD owner

Name of the owner:	Pavigrés Cerâmicas, S.A.
Production site:	Zona Industrial da Quinta, 3050-481 Mealhada, Portugal (Cerev)
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:	PAVIGRÉS GRUPO
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: Mission: 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:	1. CTCV - Centro Tecnológico da Cerâmica e do Vidro 2. PAVIGRÉS CERÂMICAS, S.A.
Contact of the authors:	1. CTCV materiais: habitat | iParque Tecnológico de Coimbra – lote 6 | 3040-540 Antanhol – Portugal (T) + 351 239 499 200 Marisa almeida: marisa@ctcv.pt 2. Pavigrés Cerâmicas, S.A., Av. Alto das Domingas, 3780-244 – Aguim (T) + 351 231 510 600 e-mail: ritatovim@pavigres.com
Issue date:	07/04/2026
Registration date:	26/06/2026
Registration number:	DAP 025:2026
Valid until:	31/12/2031
Representativity of the EPD (location, manufacturer, group of manufacturers):	The DAP covers all ceramic wall tiles products in Group BIII, 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 20251247726, verified by the INIES (France) verification program on 07/04/2026.	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:	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
Composition of the Sectorial Panel:	-
Consultation period:	18/11/2015 - 18/01/2016 12/08/2023 – 30/11/2023
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:	1. RCP: Floor covering 2. RCP: Wall covering 3. EN 17160:2019 – Product Category Rules for Ceramic Tiles
Issue date:	1. 10/02/2014 2. 10/02/201a 3. 27/02/2019, in force since 15/04/2019
Number of registrations on the database:	1. RCP001:2014 2. RCP002:2014 3. --
Version:	1. Version 1.2 (june 2022) 2. Version 1.2 (june 2022) 3. --
Identification and contact of the coordinator(s):	1. RCP: Floor covering • Marisa Almeida | marisa@ctcv.pt • Luís Arroja | arroja@ua.pt 2. RCP: Wall covering • Luís Arroja | arroja@ua.pt • Marisa Almeida | marisa@ctcv.pt
Identification and contact of the authors:	3. RCP: Floor covering • Marisa Almeida | marisa@ctcv.pt • Luís Arroja | arroja@ua.pt

	• Ana Cláudia Dias | acdias@ua.pt 4. RCP: Wall covering • Marisa Almeida | marisa@ctcv.pt • Luís Arroja | arroja@ua.pt • Ana Cláudia Dias | acdias@ua.pt
Composition of the Sectorial Panel:	1. RCP: Floor covering • RMC – Revestimentos de Mármore Compactos, S.A. • Dominó – Indústrias Cerâmicas, S.A. • APICER – Associação Portuguesa da Indústria de Cerâmica • Sonae Indústria, SGPS, S.A. 2. RCP: Wall covering • 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:	1. 01/08/2013 – 30/11/2013 2. 12/08/2013 – 30/11/2013 3. 18/11/2015 – 18/01/2016
Valid until:	1. 01/06/2027 2. 01/06/2027 3. --

1.8. Information concerning the produc/product class

Identification of the product:	Monoporous ceramic wall tiles for interior wall applications, with water absorption 16% < Eb < 19%.
Illustration of the product:	
Brief description of the product:	The ceramic wall tiles are used as floor and wall coverings in both residential and public areas. This product is available on the market in a wide range of aesthetic and dimensional options, both in terms of visual effects and textures and colours. In this EPD, the results are presented per unit area ($1m^2$) of the product (weighted average of 12.6 kg/m^2). However, the production process is the same regardless of the thickness or format of the products.

Main technical characteristics of the product:

Table 1: Technical characteristics of ceramic wall tiles - EN 14411: Group BIII

Parameters	Value	Test standard
Dimensional Characteristics	Linear dimensions ± 0.5% Orthogonality ± 0.5% Straightness ± 0.3% Planarity +0.5%/-0.3% Thickness ± 10%	EN ISO 10545-2
Water absorption	16-19%	EN ISO 10545-3
Mechanical flexural strength (N)	(<7,5 mm) | > 300N (≥7,5 mm) | > 600N	EN ISO 10545-4
Rupture modulus N/mm^2	(<7,5 mm) | ≥ 16N/mm^2 (≥7,5 mm) | ≥ 16N/mm^2	
Linear thermal expansion (x10^{-6}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

Description of the product's application/use:

These products have a wide range of applications in construction and other works, and can be applied to interior walls, namely in the following applications:

- 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:

EN 14411:2012
EN ISO 10545

Quality control

In accordance with the product technical standards.

Special delivery conditions:

Not applicable.

Components and substances to declare:

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	92-95%	12.6
Others	5-8%	
Packaging	**Percentage**	
Wooden pallets	59.5%	0.178
Cardboard	34.1%	0.1022
Others	6.4%	0.0192

Where explanatory material may be obtained:	https://pavigres.com/
History of the LCA studies:	- CTCV, 2019 (DapHabitat) (DAP n. º 00000880) - CTCV, 2021 (INIES, França) (FDES 0281266112021) - CTCV, 2024 (DapHabitat) (DAP n. º 010 :2024) - CTCV, 2026 (INIES, França) (FDES 20251247726)

1.9. Calculation rules of the LCA

Functional unit:	To cover and decorate 1m^2 of interior or exterior wall surface, with a reference service life of 50 years, using ceramic wall tiles (monoporous - group BIII) with an average thickness of 7.80 mm (6.50 mm – 10.50 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 ceramic wall 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 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. The environmental impacts indicated in this EPD are a weighted average of all ceramic tiles manufactured by Pavigrés in 2022.
Quality and other characteristics about the information used in the LCA:	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. 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.

Allocation rules:	At the Cerev production facility, two types of products are manufactured: porcelain tiles (BIa) and ceramic wall tiles (BIII). Therefore, a mass allocation was carried out based on tile production.
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 monoporous ceramic wall 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 6.50 to 10.50 mm, with an average mass of 12.6 kg/m^2.

1.11. Technical information for Reference Service Life (RSL)

The reference service life is 50 years, in accordance with Annex L 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 L 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	In compliance with standard EN 14411.
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	Wash with water and detergent once every three months.

1.12. Flow diagram of input and output of the process

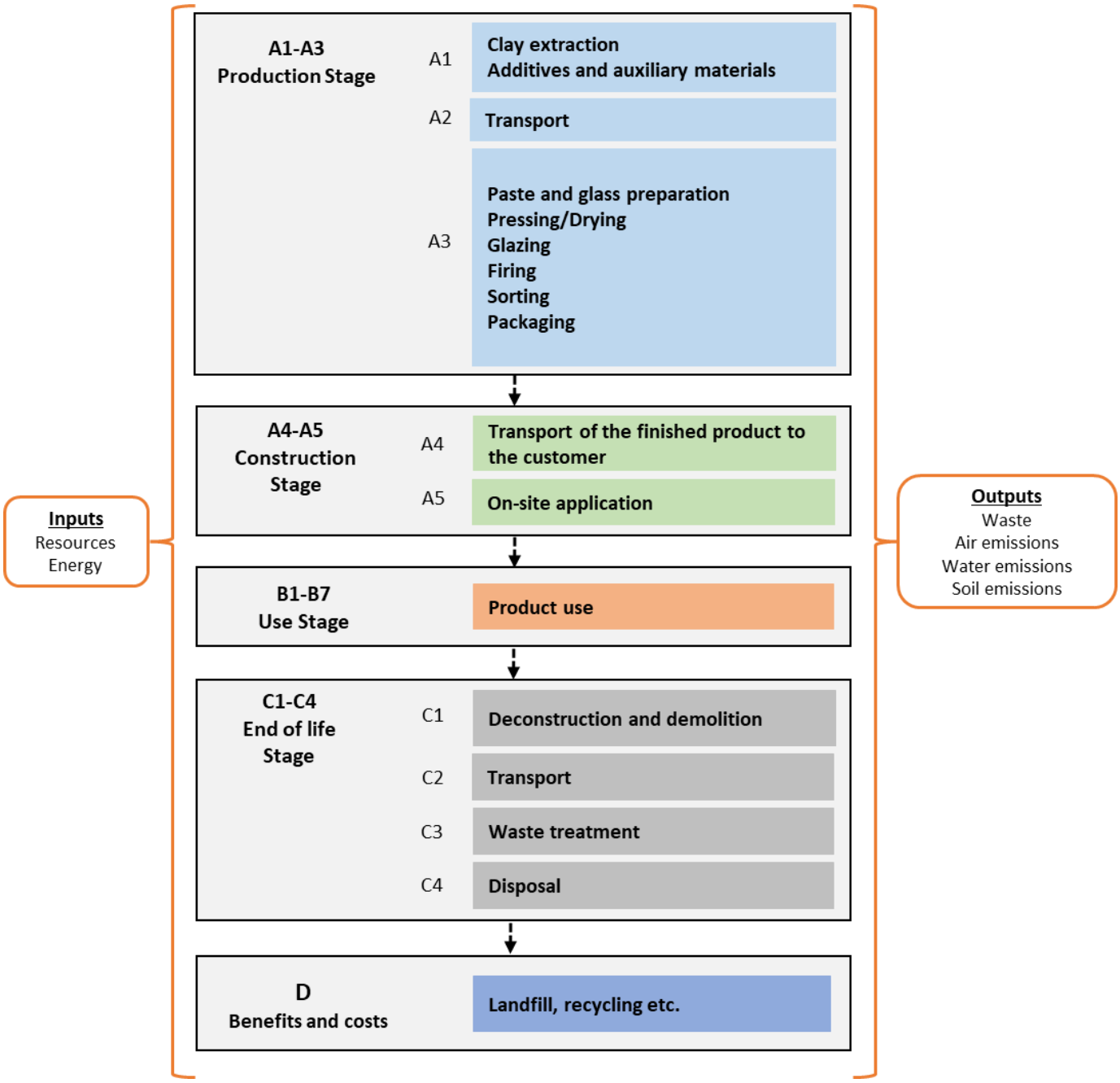

Figure 1: Example of the life cycle stages and unit processes of the product.

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, synthesised raw materials, and additives are used, the main ones being clays, feldspars, sands, carbonates, and kaolins.

At the Cerev production facility, monoporous ceramic wall tiles are also manufactured. In this case, the manufacturing process at the plant begins with the reception of atomized wall tile powder (produced at specialized external facilities according to Cerev requirements), which is stored in dedicated silos.

This is followed by the shaping stage, through powder pressing, followed by drying (dryers fuelled by natural gas) and glazing. Depending on the aesthetic characteristics of the final product, the number and type of auxiliary equipment activated along the production line, as well as the type of applications used, may vary. These applications are previously prepared in the glazes and Inks section through the grinding of compositions (from raw materials such as: frits, colorants (metal oxides), etc.).

The single-firing thermal process then follows, carried out in continuous kilns fuelled by natural gas. The material then proceeds to sorting and packaging, with quality control processes carried out during sorting.

The product may also undergo subsequent treatment, such as cutting or rectification.

Construction stage, A4-A5

A4 includes transport from the production site to the wall tile 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: 12.6 kg (100%) of product + 3.3 kg mortar
Recovery system specified by type	0 kg intended for reuse 11.13 kg intended for recycling (70%) 0 kg intended for energy recovery
Disposal specified by type	4.77 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% 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	9.95E+00	1.04E+01	-4.36E-01	1.39E-02	3.96E-07	2.40E-02
Module A4	2.63E+00	2.63E+00	7.95E-04	5.16E-05	5.69E-08	3.31E-03
Module A5	1.37E+00	9.63E-01	4.04E-01	5.41E-04	1.42E-08	8.43E-09
Module B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B2	9.43E-02	9.21E-02	2.09E-03	1.38E-04	4.59E-09	6.37E-04
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	5.65E-02	5.64E-02	1.71E-05	1.11E-06	1.22E-09	7.10E-05
Module C3	7.14E-02	7.09E-02	5.48E-04	3.40E-05	1.17E-09	5.75E-04
Module C4	4.33E-02	4.33E-02	4.11E-05	1.14E-05	7.48E-10	3.41E-04
Module D	-1.30E-02	-1.23E-02	-7.10E-04	-3.20E-06	-2.09E-10	-9.81E-05

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	1.06E-04	6.11E-03	6.37E-02	2.46E-02	1.14E-04	1.40E+02	9.50E-01
Module A4	2.07E-06	8.21E-04	8.00E-03	6.16E-03	9.05E-08	3.50E+01	3.20E-02
Module A5	1.27E-05	7.30E-04	7.41E-03	2.36E-03	3.45E-06	7.47E+00	1.68E-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	5.60E-06	7.46E-05	8.32E-04	3.12E-04	1.01E-07	2.49E+00	1.09E+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	4.43E-08	1.76E-05	1.71E-04	1.32E-04	1.94E-09	7.51E-01	6.87E-04
Module C3	1.26E-06	2.48E-04	2.70E-03	8.02E-04	3.10E-09	1.05E+00	3.83E-03
Module C4	5.54E-08	1.58E-04	1.71E-03	5.11E-04	1.78E-09	5.72E-01	7.44E-04
Module D	-1.03E-07	-4.37E-05	-4.77E-04	-1.45E-04	-5.17E-09	-2.40E-01	-3.64E-03

LEGEND:

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

NOTES: P.C.I. – Net calorific value

Units expressed by functional unit.

"The results obtained for the indicators "Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)", "Abiotic depletion potential for fossil resources potential (ADP-fossil)" and "Water (user) deprivation potential (WDP)" should be used with caution since the uncertainties associated with them are high or there is little experience with the indicator."

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	3.79E-06	1.47E-01	4.90E+01	1.73E-09	3.96E-08	6.95E+01
Module A4	1.58E-07	5.57E-03	1.55E+01	1.63E-10	1.81E-08	6.65E-02
Module A5	1.37E-07	2.13E-02	2.86E+00	2.00E-10	4.32E-09	6.54E+00
Module B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B2	4.45E-09	1.00E-02	2.57E-01	8.65E-11	1.88E-09	1.98E-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	3.40E-09	1.19E-04	3.33E-01	3.50E-12	3.88E-10	1.43E-03
Module C3	9.70E-08	2.61E-03	3.89E-01	6.41E-12	2.30E-10	3.03E-01
Module C4	4.46E-08	1.10E-04	2.78E-01	4.20E-12	1.66E-10	2.02E-01
Module D	-2.99E-09	-2.25E-03	-7.35E-02	-6.67E-12	-4.38E-11	-1.14E+00

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.

The impact indicator “POTENTIAL HUMAN EXPOSURE EFFICIENCY RELATIVE TO U235” focuses mainly on the possible impact of a low dose of ionising radiation on human health resulting from the nuclear fuel cycle. It does not consider effects arising from possible nuclear accidents, occupational exposure or the disposal of radioactive waste in underground facilities. Potential ionising radiation from soil, radon and some building materials is also not measured by this indicator.

The results of the indicators “POTENTIAL COMPARATIVE TOXIC UNIT FOR ECOSYSTEMS (ETP-FW)”, “POTENTIAL COMPARATIVE TOXIC UNIT FOR HUMANS, CANCER EFFECTS”, “POTENTIAL COMPARATIVE TOXIC UNIT FOR HUMANS, NOT CANCER EFFECTS” and “POTENTIAL SOIL QUALITY INDEX” should be used with caution as the uncertainties associated with them are high or there is little experience with the indicator.

2.4. Indicators describing resource use

	Primary energy					
	EPR	RR	TRR	EPNR	RNR	TRNR
Unit	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	1.45E+01	4.28E+00	1.88E+01	1.40E+02	5.02E-01	1.40E+02
Module A4	4.96E-02	0.00E+00	4.96E-02	3.58E+01	0.00E+00	3.58E+01
Module A5	1.36E+00	2.25E-01	1.58E+00	7.48E+00	0.00E+00	7.48E+00
Module B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module B2	1.97E-01	0.00E+00	1.97E-01	2.81E+00	0.00E+00	2.81E+00
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	1.06E-03	0.00E+00	1.06E-03	7.68E-01	0.00E+00	7.68E-01
Module C3	5.46E-02	0.00E+00	5.46E-02	1.11E+00	0.00E+00	1.11E+00
Module C4	1.01E-02	0.00E+00	1.01E-02	5.93E-01	0.00E+00	5.93E-01
Module D	-9.74E-02	0.00E+00	-9.74E-02	-2.79E-01	0.00E+00	-2.79E-01

LEGEND:

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

EPR = use of renewable primary energy excluding renewable primary energy resources used as raw materials; RR = use of renewable primary energy resources used as raw materials; TRR = total use of renewable primary energy resources (EPR + RR); EPNR = use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; RNR = use of non-renewable primary energy resources used as raw materials; TRNR = total use of non-renewable primary energy resources (EPRN + RNR);

NOTE: Units expressed by functional unit.

	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	1.92E+00	0.00E+00	0.00E+00	3.00E-02
Module A4	0.00E+00	0.00E+00	0.00E+00	6.68E-04
Module A5	0.00E+00	0.00E+00	0.00E+00	4.13E-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	2.63E-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	1.43E-05
Module C3	0.00E+00	0.00E+00	0.00E+00	2.58E-04
Module C4	0.00E+00	0.00E+00	0.00E+00	3.27E-05
Module D	0.00E+00	0.00E+00	0.00E+00	-2.36E-03

LEGEND:

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

MS = use of secondary material; CSR = use of renewable secondary fuels; CSNR = use of non-renewable secondary fuels.

NOTE: Units expressed by functional units.

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	9.73E-04	7.43E-01	1.19E-04
Module A4	8.94E-05	1.41E-03	2.45E-04
Module A5	3.34E-05	1.19E-01	2.51E-05
Module B1	0.00E+00	0.00E+00	0.00E+00
Module B2	1.22E-06	5.03E-03	8.91E-06
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	1.92E-06	3.02E-05	5.24E-06
Module C3	2.01E-06	1.54E+00	7.43E-06
Module C4	1.46E-06	4.77E+00	4.05E-06
Module D	-3.89E-07	-3.19E-04	-2.45E-06

LEGEND:

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

NOTE: Units expressed by functional units.

2.6. Environmental information describing output flows

	Components for re-use	Materials for recycling	Materials for energy recovery	Exported energy
				Energy carrier
Unit	kg	kg	kg	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	4.32E-01	5.10E-02	5.28E-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	1.11E+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

NOTE: Units expressed by functional units.

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	1.14E-01

* 1 kg biogenic carbon is equivalent to 44/12 kg of CO_2.

** 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 ceramic wall tiles – Group BIII.
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)	BIII: Waste rate 3%; Ceramic waste 378 g; Cardboard 108.4 g; PE film 19.7 g; Pallets 188.2 g
Materials (specified by type) produced by waste processing on the construction site, e.g. collection for recycling, energy recovery, disposal (specified by method)	BIII: Recycled ceramic waste 264.6 g; Ceramic waste to landfill 113.4 g; Incinerated cardboard 5.4 g; Recycled cardboard 95.4 g; Cardboard to landfill 7.6 g; Incinerated PE film 9.5 g; Recycled PE film 5.1 g; PE film to landfill 5.1 g; Incinerated wood 37.6 g; Recycled wood 71.5 g; Wood to landfill 79.0 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 wall tiles considered residential use, with the use of 0.134 ml of detergent and 0.1 l of water to clean 1m^2 of ceramic wall tiles once every three months.

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% was considered for ceramic wall tiles (monoporous) (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);