

# DAPHabitat System ENVIRONMENTAL PRODUCT DECLARATION

www.daphabitat.pt

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



Registration number: **DAP 018:2024**



## VENTILATED FACADE PANELS TERRART®-CLAD

Date of issue: 02/12/2024

Expiration date: 01/12/2029

HUNTER DOUGLAS PORTUGAL, S.A. (NBK IBERIA)



ARCHITECTURAL  
TERRACOTTA

A Hunter Douglas Company



Cluster Habitat  
Sustentável

Version 1.4.1 Ed. Março 2024

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## 1. GENERAL INFORMATION

### 1.1. DAPHabitat system

<b>Program Operator:</b>	Platform for Sustainable Construction Association <a href="http://www.clusterhabitat.pt">www.clusterhabitat.pt</a> <a href="mailto:geral@clusterhabitat.pt">geral@clusterhabitat.pt</a>	 Cluster Habitat Sustentável
<b>Address:</b>	Department of Civil Engineering University of Aveiro 3810-193 Aveiro	
<b>Email:</b>	<a href="mailto:deptecnico@clusterhabitat.pt">deptecnico@clusterhabitat.pt</a>	
<b>Telephone number:</b>	(+351) 234 401 576	
<b>Website:</b>	<a href="http://www.daphabitat.pt">www.daphabitat.pt</a>	
<b>Logo:</b>		

### 1.2. EPD owner

<b>Name of the owner:</b>	Hunter Douglas Portugal, S.A.
<b>Production site:</b>	Parque Industrial e Empresarial da Figueira da Foz, R. Olaias, Lote 85 3090-380, Figueira da Foz, Portugal
<b>Address (head office):</b>	Industrial Zona, Lagoas, Lote 1 3850-184 Albergaria-a-Velha
<b>Telephone:</b>	<a href="tel:+351233408670">+351 233 408 670</a>
<b>E-mail:</b>	<a href="mailto:info@nbk.pt">info@nbk.pt</a>
<b>Website:</b>	<a href="http://nbkterracotta.com">nbkterracotta.com</a>
<b>Logo:</b>	
<b>Information concerning the applicable management Systems:</b>	ISO 9001:2015 – Management and Quality Systems ISO 14001:2015 – Environmental Management Systems ISO 50001:2018 – Energy Management Systems
<b>Specific aspects regarding the production:</b>	CAE 23312 – Manufacture of Ceramic Tiles, Mosaics and Slabs
<b>Organization's environmental policy:</b>	The management of Hunter Douglas Portugal, S.A., acknowledging the importance of quality of their products and services, the Environment for current and future generations and the Safety of people and goods, is committed to: - Integrate matters of Quality, Environment, Health and Safety of employees in their activities, routines and practices, through differentiated Management Systems, which allow adding value to the company's business.



- Provide quality products and services, produced on their facilities in Figueira da Foz, manufactured according to its own specifications and in balance with nature, in order to ensure customers satisfaction.
- Promote shareholders satisfaction through the return of invested capital.
- Promote employee satisfaction by empowering and involving in the HD Team, providing training to ensure the adequate skills for the required competence and work quality.
- Promote the working conditions improvement, with commitment to prevent injuries and health problems, through the elimination or minimization of incidents and control of the workplace environment.
- Select the best suppliers and develop partnership relations.
- Maintain ethical and responsible behavior with customers, competitors, employees, suppliers, subcontractors, government agencies, community and the environment.
- Prevent pollution and promote the improvement of environmental performance, focused on protecting the environment;
- Control the consumption of energy and natural resources and reduce waste production;
- Continuously improve management systems, quality and environmental performance;
- Comply with all legal and other requirements that the organization and the group subscribe to in terms of product, environment, health and safety, as well as all applicable regulatory requirements (NP EN ISO 9001 and NP EN ISO 14001).
- Promote mechanisms for communicating our policy and practices to our employees, customers, suppliers and subcontractors.

The management subscribes this Policy and is committed to make all resources available for the implementation and to periodically review the Quality and Environment Management Systems aiming the permanent adaptation and continuous improvement

### 1.3. Information about DAP

<b>Authors:</b>	1. Technological Center for Ceramics and Glass (CTCV) 2. Hunter Douglas Portugal, S.A.
<b>Contact of the authors:</b>	1. CTCV materials: habitat   iParque – Coimbra Technology Park - Lot 6   3040-540 Antanhol – Portugal (T) +351 239 499 200 Marisa Almeida: <a href="mailto:marisa@ctcv.pt">marisa@ctcv.pt</a>  2. Hunter Douglas Portugal, S.A. Industrial and Business Park of Figueira da Foz, R. Olaias Lote 85, 3090-380, Figueira da Foz, Portugal (T) +351 233 408 670
<b>Issue date:</b>	02/12/2024
<b>Registration date:</b>	17/12/2024
<b>Registration number:</b>	DAP 018:2024
<b>Valid until:</b>	01/12/2029
<b>Representativity of the EPD (location, manufacturer, group of manufacturers):</b>	EPD of an 18 mm TERRART-CLAD® ventilated facade panel, belonging to a single producer (Hunter Douglas Portugal, S.A.) at the above-mentioned place of production.
<b>Where to consult explanatory material:</b>	<a href="https://nbkterracotta.com/">https://nbkterracotta.com/</a>
<b>Type of EPD:</b>	Cradle-to-gate DAP (A1-A3) with C and D modules

### 1.4. Demonstration of the verification

External independent verification, accordingly with the standard ISO 14025:2010 and EN 15804:2012+A2:2019	
Certification Body	Verifier
	
(CERTIF – Associação para a Certificação)	(Helena Gervásio)

### 1.5. EPD registration

Program Operator

(Platform for Sustainable Construction)

## 1.6. Product category rules (PCR) base model applied\*


<b>Name:</b>	1. CPR: Base Model for Construction Products and Services 2. CPR: Wall covering
<b>Issue date:</b>	1. 19/01/2016 2. 10/02/2014
<b>Number of registration on the data base:</b>	1. PCR-MB001 2. RCP002:20144.
<b>Version:</b>	1. Version 3 (June 2024) 2. Version 1.2 (June 2022)
<b>Identification and contact of the coordinator (s):</b>	1. PCR: Base Model for Construction Products and Services <ul style="list-style-type: none"> <li>• Marisa Almeida   <a href="mailto:marisa@ctcv.pt">marisa@ctcv.pt</a></li> <li>• Luís Arroja   <a href="mailto:arroja@ua.pt">arroja@ua.pt</a></li> <li>• José Silvestre   <a href="mailto:ids@civil.ist.utl.pt">ids@civil.ist.utl.pt</a></li> </ul> 2. PCR: Wall covering <ul style="list-style-type: none"> <li>• Luís Arroja   <a href="mailto:arroja@ua.pt">arroja@ua.pt</a></li> <li>• Marisa Almeida   <a href="mailto:marisa@ctcv.pt">marisa@ctcv.pt</a></li> </ul>
<b>Identification and contact of the authors:</b>	Marisa Almeida   <a href="mailto:marisa@ctcv.pt">marisa@ctcv.pt</a> Luís Arroja   <a href="mailto:arroja@ua.pt">arroja@ua.pt</a> José Silvestre   <a href="mailto:ids@civil.ist.utl.pt">ids@civil.ist.utl.pt</a> Fausto Freire Cristina Rocha Ana Paula Duarte Ana Cláudia Dias Helena Gervásio Victor Ferreira Ricardo Mateus António Baio Dias
<b>Composition of the sectorial panel:</b>	2. PCR: Wall coverings <ul style="list-style-type: none"> <li>• RMC - Revestimentos de Mármore Compactos, S.A.</li> <li>• Dominó – Indústrias Cerâmicas, S.A.</li> <li>• Sonae Indústria, SGPS, S.A.</li> <li>• APICER – Portuguese Association of the Ceramics Industry</li> </ul>
<b>Consultation period:</b>	1. 18/11/2015 - 18/01/2016 2. 12/08/2013 - 30/11/2013
<b>Valid until:</b>	1. 01/06/2027 2. 01/06/2027

The CEN EN 15804 standard serves as the basic rules for the product category (PCR).

## 1.7. Relevant c-PCR (Complementary product category rules)\*

<b>Name:</b>	EN 17160:2019 – Product category rules for ceramic tiles
<b>Date of issue:</b>	27-Feb-2019, in force since 15-Apr-2019
<b>Database Registration Number:</b>	Not applicable
<b>Version:</b>	Not applicable
<b>Identification and contact of the coordinator(s):</b>	CEN
<b>Identification and contact of the authors:</b>	CEN
<b>Composition of the sectorial panel:</b>	Not applicable
<b>Consultation period:</b>	Not applicable
<b>Valid until:</b>	Not applicable

## 1.8. Product Information/Product Class

Identification of the product:	Ventilated facade panels TERRART-CLAD® 18																		
Illustration of the product:																			
Brief description of the product:	<p>Hunter Douglas Portugal develops and manufactures ceramic products for ventilated façade projects for buildings, customized according to the customer's needs. The TERRART® range is made up of panels made of fired clay, manufactured with different clay mixtures and specific firing cycles that allow different surfaces and colours to be obtained.</p> <p>The TERRART-CLAD® system provides medium-format elements with a reduced mass per unit area, which are manufactured individually based on the design specification. In terms of technical characteristics, a panel with horizontal alignment has an average weight of 35.2 kg/m², length between 100 and 1200 mm, height between 150 and 300 mm and a thickness of 18 mm. The TERRART-CLAD® façade is a ventilated curtain-wall/rainscreen system whose exposed components are made exclusively of terracotta.</p>																		
Main technical characteristics of the product:	<p>The technical characteristics of the TERRART-CLAD® ventilated façade panels meet the requirements of the EN ISO 10545 standard, as indicated in Table 1.</p> <p>Table 1: Technical characteristics of TERRART-Clad panels</p> <table><tr><th>Key features</th><th>Performance</th><th>Standard Testing</th></tr><tr><td>Water absorption</td><td>Meets</td><td>EN ISO 10545-3</td></tr><tr><td>Breaking Load</td><td>&gt; 17.5 N/mm2</td><td>EN ISO 10545-4</td></tr><tr><td>Density</td><td>2.05-2.20kg/dm3</td><td>-</td></tr><tr><td>Frost resistance</td><td>Complies (100 cycles)</td><td>EN ISO 10545-12</td></tr><tr><td>Chemical Resistance</td><td>Class HA</td><td>EN ISO 10545-13</td></tr></table> <p>Note: specific information in the product technical sheet.</p>	Key features	Performance	Standard Testing	Water absorption	Meets	EN ISO 10545-3	Breaking Load	> 17.5 N/mm2	EN ISO 10545-4	Density	2.05-2.20kg/dm3	-	Frost resistance	Complies (100 cycles)	EN ISO 10545-12	Chemical Resistance	Class HA	EN ISO 10545-13
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Water absorption	Meets	EN ISO 10545-3																	
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Frost resistance	Complies (100 cycles)	EN ISO 10545-12																	
Chemical Resistance	Class HA	EN ISO 10545-13																	
Description of the product's application/use:	For use in ventilated facades for buildings.																		
Placing on the market / Rules of application in the market / Technical rules of the product:	<ul style="list-style-type: none"><li>• EN ISO 10545 Ceramic tiles;</li><li>• Certificate of conformity according to Regulation (EU) No. 305/2011.</li></ul>																		
Quality control:	NBK promotes employee satisfaction by empowering and engaging staff, providing training to ensure the appropriate skills for the required competence and quality of work. NBK undertakes to comply with all legal and other requirements that the organization and the group subscribe to in terms of product, environment, health and safety, as well as all applicable regulatory requirements (NP EN ISO 9001 and NP EN ISO 14001).																		
Special delivery conditions:	Not applicable																		
Components and substances to declare:	The product does not contain any substances included in the Candidate List of Substances of Very High Concern (SVHC) above the threshold for registration with the European Chemicals Agency, i.e. above 0.1% (w/w).																		
Information where explanatory documents can be obtained:	<p>The raw materials after automatic mixing give rise to products formed by plastic through extrusion, which are dried and baked, eventually glazed, giving rise to various ceramic products.</p> <p>TERRART-CLAD® ventilated façade panels feature a varied spectrum of colors and allow for special effects, which can contribute to creative ideas of architects and applicators.</p> <p>The TERRART-CLAD® product can be found at an authorized dealer in Portugal (Horácio Costa Lda), or by direct request to the company NBK Keramik GmbH. All technical information on the manufacture and assembly of the product is available on the company's website: <a href="https://nbkterracotta.com">https://nbkterracotta.com</a>.</p> <p>Quality and environmental standards in accordance with ISO 9001:2015 and ISO 14001:2015 and the provisions outlined in the relevant regulations.</p>																		
History of LCA studies:	Not applicable																		

## 1.9. Calculation rules of the LCA

<b>Functional Unit:</b>	1 m2 of TERRART-CLAD® ceramic panel
<b>Declared Unit:</b>	Not applicable
<b>System Boundaries:</b>	The evaluated system includes modules A1-A3 (product step), C (end-of-life step), and D (benefits and environmental burdens beyond the system boundary).
<b>Exclusion Criteria:</b>	The following processes were not considered in this study, as they fall under the exclusion criteria: <ul style="list-style-type: none"> <li>• The environmental burdens associated with the construction of industrial infrastructures and the manufacture of machinery and equipment;</li> <li>• The environmental loads related to the infrastructure (vehicle production, road maintenance) of the transport of pre-products;</li> </ul>
<b>Assumptions and limitations:</b>	The environmental impacts and other indicators presented in this EPD were determined for the year 2022 and constitute average values for the entire range of TERRART-CLAD® panels manufactured at Hunter Douglas Portugal's Figueira da Foz manufacturing unit.
<b>Quality and other characteristics about the information used in LCA:</b>	The production data collected corresponds to the actual and specific data of the manufacturing unit in the year 2022. The generic data used belong to the Ecoinvent v3.7 databases and comply with the quality criteria defined for generic data (age, geographical and technological coverage, plausibility, etc.).
<b>Allocation rules:</b>	Priority was given to establishing an existing physical relationship between the inputs and outputs of the system and its various products and processes. When this was not possible, mass criteria were used for load allocation (load distribution) depending on the type of parameters and the type of process.
<b>Software used for the assessment:</b>	SimaPro, version 9.5
<b>Background database used for LCA:</b>	Ecoinvent database version 3.7.1 published in December 2020; "cut-off" approach
<b>EPD comparability of building products:</b>	EPDs of construction products and services may not be comparable if they are not produced in accordance with EN 15804 and EN 15942 and in accordance with the conditions of comparability determined by ISO 14025.

## 1.10. Use of average environmental performance

This EPD presents the average environmental performance of the entire range of TERRART-CLAD® panels produced by Hunter Douglas Portugal, SA, in 2022, with the same raw material recipe. The variability of environmental performance between specific products is not relevant.



### 1.11. Technical Information for Reference Service Life (VUR)\*

Not applicable. It is a cradle-to-gate DBD with modules C and D.

Parameter	Units	Findings**
Reference service life	Years	50
Declared product properties (at the gate) and finishes, etc.	Appropriate units	For more information contact NBK or request the technical data sheets.
Design application parameters (if instructed by the manufacturer), including references to appropriate practices and application codes	Appropriate units	For more information, contact NBK or request the technical data sheets
Assumed quality of workmanship when installed in accordance with the manufacturer's instructions	Appropriate units	For more information, contact NBK or request the technical data sheets
Outdoor environment (for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature	Appropriate units	Relevant characteristic values according to Annex G of EN 14411. For more information, contact NBK or request the technical data sheets
Indoor environment (for indoor applications), e.g. temperature, unit, chemical exposure	Appropriate units	Relevant characteristic values according to Annex G of EN 14411. For more information, contact NBK or request the technical data sheets
Conditions of use, e.g. frequency of use, chemical exposure	Appropriate units	Relevant characteristic values according to Annex G of EN 14411. For more information, contact NBK or request the technical data sheets
Maintenance, e.g. frequency of use, mechanical exposure	Appropriate units	-
**expressed by functional unit or declared unit		

## 1.12. Diagram of process input and output flows

Production process of TERRART-CLAD® 18 mm panels produced at Hunter Douglas Portugal, S.A.:

The main raw materials for production are stored in silos or bigbags, in a specific location, to ensure compliance with the technical specifications of the same and subsequent product quality. After its validation, the recipe is defined and the production process begins. The process management is automatic and optimized, from the initial dosing and mixing system, conveying system with weighing screens, secondary mixing and product forming.

The conformation of the products is plastic through extrusion molding, obtaining the parts with the desired shape and dimension.

The extruded products are dried in a continuous roller dryer and through this thermal processing at set temperatures it allows to reduce the moisture of the material.

The dry products can be introduced into a glazing line where the most varied colors are applied and special textures are made (optional).

After drying, and eventually glazing, the products are subjected to a thermal processing operation at temperatures of around 1100°C, in a roller furnace powered by natural gas.

After firing, the ceramic products are cut and drilled, according to the installation or customer requirements.

The material at the exit of the roller furnace passes to the picking and packaging line.

After packaging, the products are transported, using forklifts, to the final product park where they are stored for later shipment.

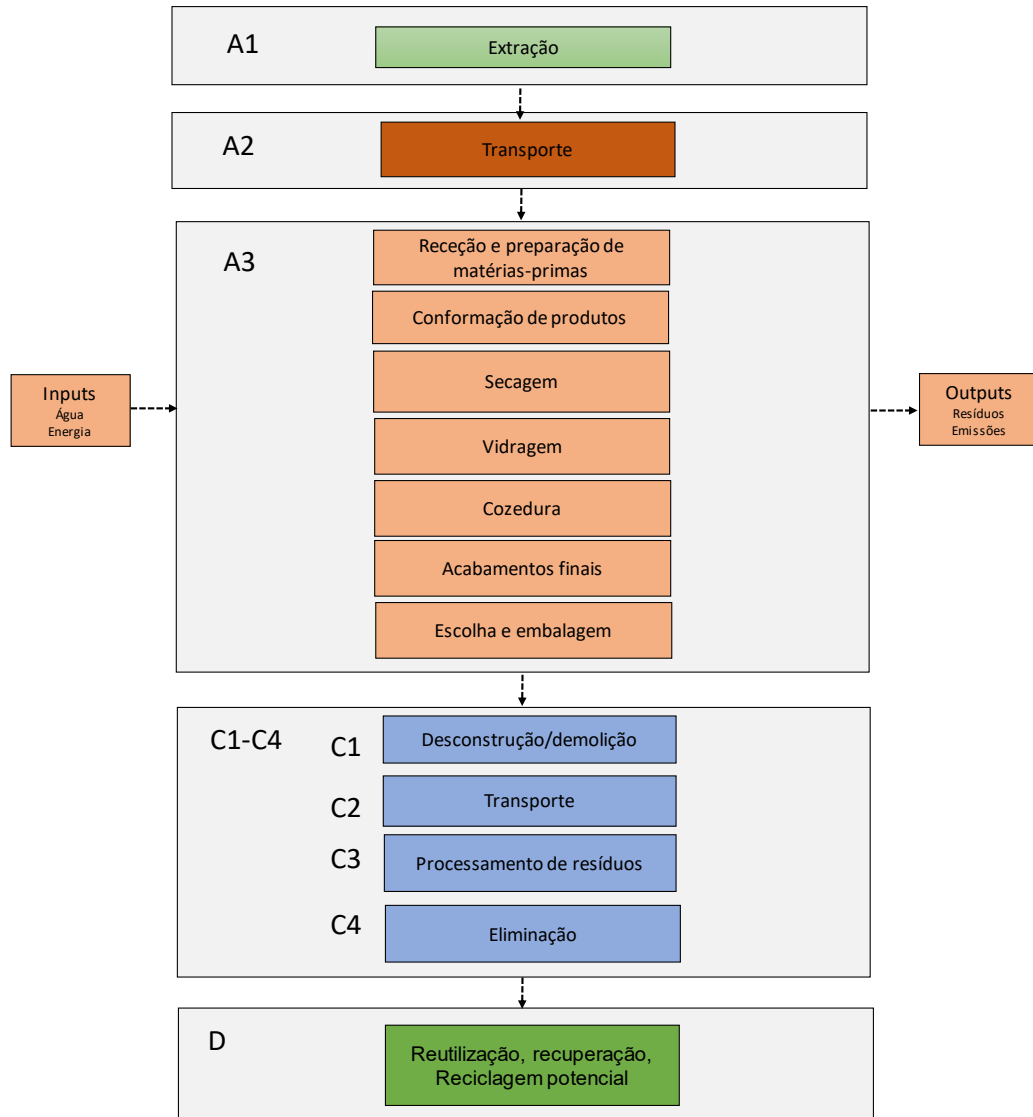


Figure 1: Life cycle stages and unit processes of the product under study.

## 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	Rehabilitation	Operational energy use	Operational water use	De-construction and demolition	Transport	Waste processing	Disposal	Re-use, recovery, recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
✓	✓	✓	ND	ND	ND	ND	ND	ND	ND	ND	ND	✓	✓	✓	✓	✓

Modules **A1-A3** include the processes that supply energy and material inputs to the system (A1), transport to the factory gate (A2) and manufacturing process, as well as waste processing (A3).

The production process of TERRART-CLAD® panels begins with the reception of raw materials (clays and additives) and their preparation. This is followed by the extrusion and drying of the products to reduce the moisture of the material. After drying and eventually glazing, for the application of various colors and special textures, the products are baked in a roller oven. The ceramic products are then cut and drilled according to the customer's requirements and then proceed to the sorting and packaging line. The packaged products are stored for later shipment.

The **A4 module** includes transport from the production site to the customer. It was not considered in this evaluation.

Module **A5** considers all stages of ceramic panel installation and packaging waste processing (recycling, incineration, disposal). It was not considered in this evaluation.

Module **B1** considers the use of the installed product. It was not considered in this evaluation.

Module **B2** includes preventive and regular maintenance activities, such as cleaning, correcting or repairing damaged or degraded parts. It was not considered in this evaluation.

Modules **B3-B4-B5** are related to the replacement, repair and rehabilitation of ceramic panels. If the panels are correctly installed, no repair, replacement or rehabilitation process will be necessary. For this reason, there should be no impacts to be declared in modules B3-B4-B5, however it was not considered in this evaluation.

Modules **B6-B7** consider the use of energy and water to operate technical systems integrated into buildings (heating, cooling, ventilation, lighting, hot water systems, etc.). Operational energy or water use is not considered. The cleaning water is declared in module B2. It was not considered in this evaluation.

Module **C1** refers to the process of demolition and deconstruction of the ceramic tiles of the building. According to the EN17160 is considered despicable.

Module **C2** considers the transport of the discarded ceramic tile to a recycling or landfill process. It was considered 30 km (see EN17160).

Module **C3** takes into account all waste processing processes (collection, crushing, etc.) in an appropriate way for the recycling of tiles (70% according to EN17160). In this module, the impacts associated with the end of life of the packaging used (with a view to zero balance in the wood) were also considered.

Module **C4** includes all landfill processes, including pretreatment and management of the landfill site (30% according to EN17160).

Module **D** includes the benefits or loads on the environment generated by the reusable products, recyclable materials, and/or energy carriers that come out of a product system. Replacement by aggregates for construction was considered.

### 2.1.1. Justification for the exemption from declaration of modules C1, C2, C3, C4 and D

Not applicable.

## 2.2. Basic environmental impact indicators

	Global warming potential - total; GWP-total	Global warming potential fossil; GWP-fossil	Global warming potential biogenic; GWP-biogenic	Global warming potential - Land use and land use change; GWP-luluc	Depletion potential of the stratospheric ozone layer ODP	Acidification potential; AP
Unit	kg CO2 eq.	kg CO2 eq.	kg CO2 eq.	kg CO2 eq.	kg CFC 11 eq.	mol H+ eq.
Modules A1-A3	2,65E+01	2,80E+01	-1,51E+00	2.85E-02	3.25E-06	7,72E-02
Module C1	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Module C2	1.42E-01	1.42E-01	1.14E-04	1.08E-06	3.31E-08	2.81E-04
Module C3	2,20E+00	7.60E-02	2,12E+00	1,11E-06	1.71E-08	8.20E-04
Module C4	8.72E-02	8.69E-02	2.71E-04	1.81E-06	1.98E-08	7.75E-04
Module D	-5.41E-02	-5.08E-02	-3.35E-03	-2.99E-05	-9.42E-09	-4.34E-04

**CAPTION:**

	Product Stage
	End of Life Stage
	Benefits and loads beyond the system boundary

Values expressed by functional unit (1 m2).

	Eutrophication potential aquatic freshwater; EP-freshwater	Eutrophication potential aquatic marine; EP-marine	Eutrophication potential terrestrial; EP-terrestrial	Formation potential of tropospheric ozone; POCP	Abiotic depletion potential for non-fossil resources ADP-minerals&metals	Abiotic depletion potential for fossil resources potential ADP-fossil	Water (user) deprivation potential; WDP
Unit	kg P eq.	kg N eq.	mol N eq.	Kg VOCNM eq.	kg Sb eq.	MJ, P.C.I	m3 eq. water globally unavailable
Modules A1-A3	2,25E-04	2.80E-02	1.67E-01	1,36E-01	1,14E-03	3.92E+02	5,60E+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	4.69E-05	5,21E-04	1.84E-04	6.05E-09	2,02E+00	-4.28E-04
Module C3	5.69E-08	3.68E-04	4.04E-03	1.10E-03	3.78E-09	1,05E+00	2,17E-04
Module C4	6.65E-08	3.39E-04	3.71E-03	1.01E-03	4,10E-09	1,22E+00	1.44E-04
Module D	-1.20E-06	-1.73E-04	-1.90E-03	-5.27E-04	-1.45E-08	-1,04E+00	-1.56E-02

**CAPTION:**

	Product Stage
	End of Life Stage
	Benefits and environmental burdens beyond the system boundary

**NOTES:**

P.C.I. – Lower calorific value.

Units expressed per functional unit (1m2).

## 2.3. Additional environmental impact indicators

	Potential incidence of disease due to PM emissions PM	Potential Human exposure efficiency relative to U235 IRP	Potential Comparative Toxic Unit for ecosystems ETP-fw	Potential Comparative Toxic Unit for humans, cancer effects HTP-c	Potential Comparative Toxic Unit for humans, not cancer effects HTP-nc	Potential soil quality index SQP
Unit	Incidence of disease	kBq U 235 eq.	CTUe	CTUh	CTUh	-
Modules A1-A3	1,12E-06	5.32E-01	8,46E+02	2.41E-07	1.58E-07	2,22E+02
Module C1	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Module C2	8,22E-09	8.90E-03	8.07E-01	1.06E-11	1.26E-09	6.43E-03
Module C3	1.20E-07	4.60E-03	3.52E-01	4.62E-12	3.67E-10	3.86E-03
Module C4	6,12E-08	5.40E-03	4.51E-01	9.57E-12	6.25E-10	4.51E-01
Module D	-1.15E-08	-1.21E-02	-5.09E-01	-3.91E-11	-4.23E-10	-1,77E+00




**CAPTION:**

	Product Stage
	End of Life Stage
	Benefits and environmental burdens beyond the system boundary

## 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	4.87E+01	7.27E-01	4.94E+01	4.30E+02	1.91E-03	4.30E+02
Module C1	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Module C2	2.97E-03	0,00E+00	2.97E-03	2,15E+00	0,00E+00	2,15E+00
Module C3	1.67E-03	0,00E+00	1.67E-03	1,12E+00	0,00E+00	1,12E+00
Module C4	2,22E-02	0,00E+00	2,22E-02	1,29E+00	0,00E+00	1,29E+00
Module D	-3.78E-01	0,00E+00	-3.78E-01	-1,08E+00	0,00E+00	-1,08E+00

**CAPTION:**

	Product Stage
	End of Life Stage
	Benefits and environmental burdens 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 (EPNR + RNR);




**NOTE:**

P.C.I. – Lower calorific value.

Values expressed per functional unit (1m2).

	Secondary material and fuel, and water use			
	MS	CSR	CSNR	Use of the net value of fresh water
Unit	Kg	MJ, P.C.I.	MJ, P.C.I.	m3
Modules A1-A3	1,15E+00	0,00E+00	0,00E+00	1.47E-01
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	4.00E-05
Module C3	2,46E+01	0,00E+00	0,00E+00	2.65E-05
Module C4	0,00E+00	0,00E+00	0,00E+00	7.20E-05
Module D	0,00E+00	0,00E+00	0,00E+00	-9.15E-03

**CAPTION:**

	Product Stage
	End of Life Stage
	Benefits and environmental burdens beyond the system boundary

MS = use of secondary material; CSR = use of renewable secondary fuels; CSNR = use of non-renewable secondary fuels; Fresh water = use of the net value of fresh water.

**NOTE:**

P.C.I. – Lower calorific value.

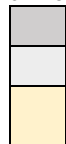
Values expressed per functional unit (1m2).



## 2.5. Other environmental information describing different categories of waste

	Hazardous waste disposed of	Non-hazardous waste disposed of	Radioactive waste disposed of
Unit	Kg	Kg	Kg
Modules A1-A3	9.38E-04	3,64E+00	6,10E-04
Module C1	0,00E+00	0,00E+00	0,00E+00
Module C2	5.35E-06	8.45E-05	1.47E-05
Module C3	2.75E-06	6.57E-05	7.57E-06
Module C4	3,17E-06	1,05E+01	8.82E-06
Module D	-1.51E-06	-6.42E-01	-9.52E-06

**CAPTION:**



Production Stage

End of Life Stage

Benefits and environmental burdens beyond the system boundary

**NOTES:**




Units expressed per functional unit (1m2).

The characteristics that make waste hazardous are described in the applicable legislation in force, for example in the European Waste Framework Directive.

## 2.6. Other environmental information describing output flows

	Components for re-use	Materials for recycling	Materials for energy recovery	Exported energy
Unit	Kg	Kg	Kg	MJ
Modules A1-A3	0,00E+00	4,10E00	1.60E-02	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	2,46E+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

### CAPTION:

	Product Stage
	End of Life Stage
	Benefits and environmental burdens beyond the system boundary

### NOTES:

Values expressed per functional unit (1m2).

The characteristics that make waste hazardous are described in the applicable legislation in force, for example in the European Waste Framework Directive

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

Biogenic carbon content*	Units**	Modules A1-A3 (results)
Biogenic carbon content in the product	Kg C	Not applicable
Biogenic carbon content in the packaging	Kg C	2.01E-02
<p>* 1 kg of biogenic carbon is equivalent to 44/12 kg of CO<sub>2</sub></p> <p>** This information may be omitted whenever the biogenic carbon content of the product, or its packaging, is less than 5% of the mass of the product, or its packaging.</p>		

## 3. SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION <sup>1</sup>

### 3.1. C1 Demolition – End of Life Stage

It refers to the process of demolishing and deconstructing the ceramic tiles of the building. According to the EN17160 is considered negligible

### 3.2. C2 Transport – End of Life Stage

<sup>1</sup> If there is no additional technical information and no scenarios have been made, the entries must be filled in with "Not applicable"

C2: The demolition waste from the slabs is transported from the construction site to a container or treatment plant by truck and an average distance of 30 km is considered, according to the reference scenario of EN 17160.

### 3.3. C3 Waste processing for reuse, reuse and recycling – End-of-Life Stage

C3: The end-of-life scenario is described in the following table:

Fate	Result	Unit of measurement
Landfill (C3)	70	%

### 3.4. C4 Waste disposal – End-of-life stage

C4: The end-of-life scenario is described in the following table:

Fate	Result	Unit of measurement
Landfill (C4)	30	%

### 3.5. Scenarios and technical information for module D

Module D includes recycling credits for ceramic materials and packaging and energy credits for thermal recovery of packaging.

According to EN 17160, after the demolition/deconstruction stage, TERRART-CLAD® panels can be shredded and used in a variety of different applications:

- In aggregates, as a basis for road construction;
- Concrete aggregates;
- When ceramic pavements are crushed, they form recycled ceramic aggregates that can be integrated as a partial substitute for natural aggregate in the hot asphalt mixture;
- Recycled ceramic aggregates can be used in the construction of landfills;
- Recycled ceramic aggregates can be used in the construction of base courses on secondary roads.

In this case, and in accordance with EN 17160, it was considered that 70% of TERRART-CLAD® panels can be shredded and used in a variety of applications, such as recycled ceramic aggregates that can be integrated as a partial substitute for natural aggregate.

### **3.6. Additional information on release of dangerous substances to indoor air, soil, and water during the use stage**

Not applicable.

## **4. REFERENCES**

- ✓ DAPHabitat System General Instructions, Version 2.1, August 2023 (in [www.daphabitat.pt](http://www.daphabitat.pt));
- ✓ CPR – base model for construction products and services. DAPHabitat System. Version 3, June 2024 (in [www.daphabitat.pt](http://www.daphabitat.pt));
- ✓ NP ISO 14025:2009 Environmental labels and declarations – Environmental declarations Type III – Principles and procedures;
- ✓ 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.