DAPHabitat System Environmental Product Declaration

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

Declaration number: DAP 003:2025

INSULATION CORK BOARD (ICB)/ THERMAL INSULATION

Issue date: 14/03/2025 **Valid until:** 13/03/2030

SOFALCA – SOC. CENTRAL DE PRODUTOS DE CORTIÇA, LDA.

Sofalca – Soc. Central de Produtos de Cortiça, Lda.

Version 1.5 Edition June 2024

SOFALCA

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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
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Telephone number:	(+351) 234 401 576
Website:	www.daphabitat.pt
Logo:	

1.2. EPD owner

Name of the owner:	Sofalca — Soc. Central de Produtos de Cortiça, Lda.
Production site:	Telhado – EN n.º 2 – km 413.2 2205-213 – Bemposta ABT
Address (head office):	Telhado – EN n.º 2 – km 413.2, 2205-213 – Bemposta ABT
Telephone number:	Eng. Paulo Ribeiro - 241 732 165
Email address:	pribeiro.sofalca@sapo.pt
Website:	https://www.sofalca.pt/
Logo:	
Information concerning the applicable management Systems:	Not applicable
Specific aspects regarding production:	Primary NACE: 16295 - Manufacture of other cork products; Secondary NACE: 02300 - Extraction of cork, resin, and harvesting of other forest products, except wood. CPC Division 31 (Wood, cork, straw, and basketry products), Group 319, Class 3192: Cork articles and straw or other materials for braiding and basketry.
Organization's environmental policy:	Not applicable

1.3. Information concerning the EPD

Authors:	1. Marco Frazão Pedroso 2. José Dinis Silvestre
Contact of the authors:	1. marco-pedroso@sapo.pt ; 966532922 2. Jose.silvestre@tecnico.ulisboa.pt ; 218419709
Issue date:	14/03/2025
Registration date:	01/04/2025
Registration number:	DAP 003:2025
Valid until:	13/03/2030
Representativity of the EPD (location, manufacturer, group of manufacturers):	EPD corresponding to the insulation cork board (ICB) panels produced at the Sofalca industrial unit in Telhado – Bemposta – Portugal.
Type of EPD	Cradle-to-gate EPD, including end-of-life stages (C1 to C4) and Module D, for business-to-business (B2B) communication.

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)	(Marisa Almeida)

1.5. EPD registration

Programme operator

(Plataforma para a Construção Sustentável)

1.6. PCR (Product Category Rules) basic model

Name:	Product Category rules (PCR) – Thermal insulation - V.1.3 (2014) - V.1.3. EDITION JUNE 2022, considering the indications of the EN 16783:2024.
Issue date:	Edition 10/02/2014
Number of registrations on the database:	RCP004:2014
Version:	Version 1.3
Identification and contact of the coordinator(s):	José Dinis Silvestre | jose.silvestre@tecnico.ulisboa.pt Manuel Duarte Pinheiro | manuel.pinheiro@ist.utl.pt
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Composition of the Sectorial Panel:	- Amorim Isolamentos - Sofalca – Soc. Central de Produtos de Cortiça, Lda. - Argex – Argila Expandida, S.A. - Sonae Industria, SGPS, S.A. - IberFibran – Poliestireno Extrudido, S.A. - MasterBlock - Termolan – Isolamentos termo-acústicos, S.A. - Eurofoam – Indústria de poliestireno extrudido, Lda - Knauf Insulation
Consultation period:	01/08/2013 to 30/11/2013
Valid until:	01/06/2027

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

1.7. Information concerning the product/product class

Identification of the product:	This EPD covers the insulation cork board (ICB) panels produced at the Sofalca industrial unit (Telhado – Bemposta).

Illustration of the product:

Brief description of the product:

The insulation cork board (ICB), commonly known as black granulated cork, is a thermal insulation product classified under the following NACE (Statistical Classification of Economic Activities in the European Community) category: Section F, Class 4329 – "Other construction installations."

ICB is manufactured from falca cork, which is obtained from the cleaning and maintenance operations of cork oak forests. This means it is produced through the recycling of forest waste from 'montado' cork oak woodlands. Once processed, it becomes expanded cork in the form of insulation panels used in buildings, construction equipment, and industrial installations.

The binding of cork granules occurs solely due to volumetric expansion and the exudation of the cork's natural resins, triggered by heat and pressure. The agglomerate contains no additional adhesives or additives, consisting exclusively of cork. For this reason, it is also referred to as pure cork agglomerate. ICB is then produced in blocks that undergo a finishing process through sawing—where the blocks are trimmed and cut. The final product is available in panels of various thicknesses, depending on the intended application.

Main technical characteristics of the product:

The technical datasheets for this product are available at: https://www.sofalca.pt/. Table 1 presents some of the product's main characteristics.

Table 1: Main technical characteristics according to DoP ICB STD Rev04 12/11/2024

Designation	Value	Units
Geometry	Boards:1000 x 500 x (10 to 300)	mm
Density	< 130	kg/m^3
Thermal conductivity	0.040	W/mK
Flexural strength	≥ 130	KPa
Compressive strength at 10% deformation	≥ 90	kPa
Water vapour permeability	386	ng/Pa.sm^2
Water vapour diffusion resistance (μ)	10.5	-
Fire reaction class	Euroclasse E	-
Fire reaction class – ETICS	B-s1,d0	-
Operating temperature	-180 to +120	ºC
Indoor air emissions	COV A	-
Sound absorption coefficient (α_w)	0.45 Class D	-
Main standard (marking)	EN 13170:2012+A1:2015	-

Description of the product's application/use:

Cork-based insulation products stand out for their excellent thermal insulation properties, as well as their ability to provide sound and vibration insulation.

Typical application areas for ICB include thermal, acoustic, and vibration insulation in: Industrial buildings; Agricultural and livestock buildings; Auxiliary buildings, annexes, and temporary installations; Sports halls and gymnasiums; Airports; Special structures and large-

	span constructions; Administrative and educational buildings; Residential buildings.
Placing on the market / Rules of application in the market / Technical rules of the product:	EN 13170:2012+A1:2015 - Thermal insulation products for buildings - Factory made products of expanded cork (ICB) – Specification.
Quality control	The quality control follows the EN 13170:2012+A1:2015 - Thermal insulation products for buildings - Factory made products of expanded cork (ICB) – Specification. Additionally, the product is subject to a Declaration of Conformity with external quality control: - CSTB (*Centre Scientifique et Technique du Bâtiment*, France) and LGAI (*Centro Tecnológico* AS, Spain) – CE marking initially granted in 2004; - LNEC (National Laboratory for Civil Engineering, Portugal) – Quality control conducted quarterly; - Internal quality control (primarily related to product dimensions) – conducted daily.
Special delivery conditions:	Not applicable
Components and substances to declare:	The product does not contain substances listed in the "Candidate List of Substances of Very High Concern (SVHC) for Authorisation" at concentrations exceeding the registration thresholds set by the European Chemicals Agency (ECHA) (i.e., greater than 0.1% by mass (m/m)).
Where explanatory material may be obtained:	Additional information can be obtained here: https://www.sofalca.pt/
History of the LCA studies:	Sofalca holds an Environmental Product Declaration (EPD) registered in the DAP Habitat system (DAP 001:2015), with a registration date of 02/06/2015, for Expanded Cork Agglomerate / Insulation Cork Board (ICB).

1.8. Calculation rules of the LCA

Declared unit:	The declared unit adopted was one cubic metre (1 m^3) of packaged ICB thermal insulation panel, measured at the factory gate (A1 to A3), as well as at end-of-life (C1 to C4) and Module D. The product has an average density of 110 kg/m^3 and, in accordance with EN 16783:2024, a thermal conductivity coefficient of 0.040 W/m·K. The environmental impacts (x) associated with one square metre (1 m^2) of the product at a given thickness (y cm) can be calculated using the following formula: x = (impacts per m^3) × y / 100
System boundaries:	This study follows a "cradle-to-gate" approach while also considering Modules C1 to C4 (end-of-life stage) and Module D (benefits beyond the system boundary), in accordance with EN 15804:2012+A2:2019/AC:2021.
Criteria for the exclusion:	The Life Cycle Assessment (LCA) developed includes all available data directly associated with the ICB panel production process. However, the following processes were not considered in this study, as they fall within the cut-off criteria of 1% of primary renewable and non-renewable energy use and 1% of the total input mass of the unit process where they occur, with a maximum exclusion of 5% of energy and mass use in the considered stages (A1-A3): - Construction of industrial infrastructure, manufacturing, and replacement of equipment and machinery; - Impacts of infrastructure (vehicle manufacturing, road maintenance) associated with the transport of pre-products and raw materials; - Water consumption, waste, and effluents from administrative areas and laboratories, as they are not directly related to the production process;

	- Transport of small consumables to the industrial unit; - Other flows deemed negligible in the modelling due to their contribution falling below the cut-off criteria; Since the EPD follows a "cradle-to-gate" approach, considering Modules C1 to C4 and D, all life cycle stages beyond the factory gate are excluded from the scope of this study, namely: distribution, the construction stage (product installation in equipment or buildings), and usage processes.
Assumption and limitations:	The LCA results are based on the following assumptions: - The selected year (2021) is representative of the product system; - The transport of raw and secondary materials is calculated based on the means of transport and aligned with the Ecoinvent database; - The life cycle inventory and impact assessment results are product-specific.
Quality and other characteristics about the information used in the LCA:	The production data collected corresponds to real and specific data from the manufacturing unit for the year 2021. During this period, ICB panels were produced at Sofalca's facilities in Telhado – Bemposta. The generic data used is sourced from the Ecoinvent v3.9 database and complies with the defined quality criteria for generic data (age, geographical and technological coverage, plausibility, etc.). Whenever possible, original database processes were adjusted to better reflect reality, such as modifying the CO_2 sequestration by falca cork, in line with the latest scientific studies. According to the criteria defined in Annex E of EN 15804:2012+A2:2019/AC:2021, as set by the UN Environmental Global Guidance on LCA Database Development, the quality of relevant data in terms of technical, geographical, and temporal representativeness was consistently rated between 'Acceptable' and 'Very Good'. This classification confirms the relevance and adequacy of the data used for the study.
Allocation rules:	In this study, the allocation of resources and impacts was applied only between ICB and the regranulated cork co-product, based on physical principles – mass allocation.
Software used for the assessment:	SimaPro v9.5.0.2
Background database used for the LCA:	The databases used have been updated within the last 10 years, with the most recent update in 2023 (Ecoinvent v3.9.1). Regarding technological coverage, all selected datasets represent average European technology or a specific European country (with a particular focus on Portugal, when available, given the location of the industrial facility). Whenever possible, the most comparable dataset available in the software databases was used, reflecting a weighted combination of technologies and industrial energy consumption in Europe (suffix RER). The preference for the Ecoinvent database is primarily due to its established reliability. However, for certain processes, the most suitable dataset was found in other databases, notably ELCD, which was used for transport modelling when data was unavailable in Ecoinvent. This was based on the Tremove model v2.7b (2009) and EcoTransIT (2011).
Comparability of EPD for construction products:	Environmental Product Declarations (EPDs) for construction products and services may not be comparable unless they are produced in accordance with EN 15804 and EN 15942, and comply with the comparability conditions defined by ISO 14025.

1.9. Use of the average environmental performance

This EPD represents the production of expanded cork agglomerate / insulation cork board (ICB) panels manufactured by Sofalca at its industrial facility in Telhado - Portugal.

Although the same manufacturing process and procedure is followed, the panels are produced in different thicknesses. The environmental impacts can be calculated based on their volume and average density, as the declared unit is one cubic meter, with a thermal conductivity of 0.040 W/m·K.

1.10. Technical information for Reference Service Life (RSL)

Not applicable.

1.11. Flow diagram of input and output of the process

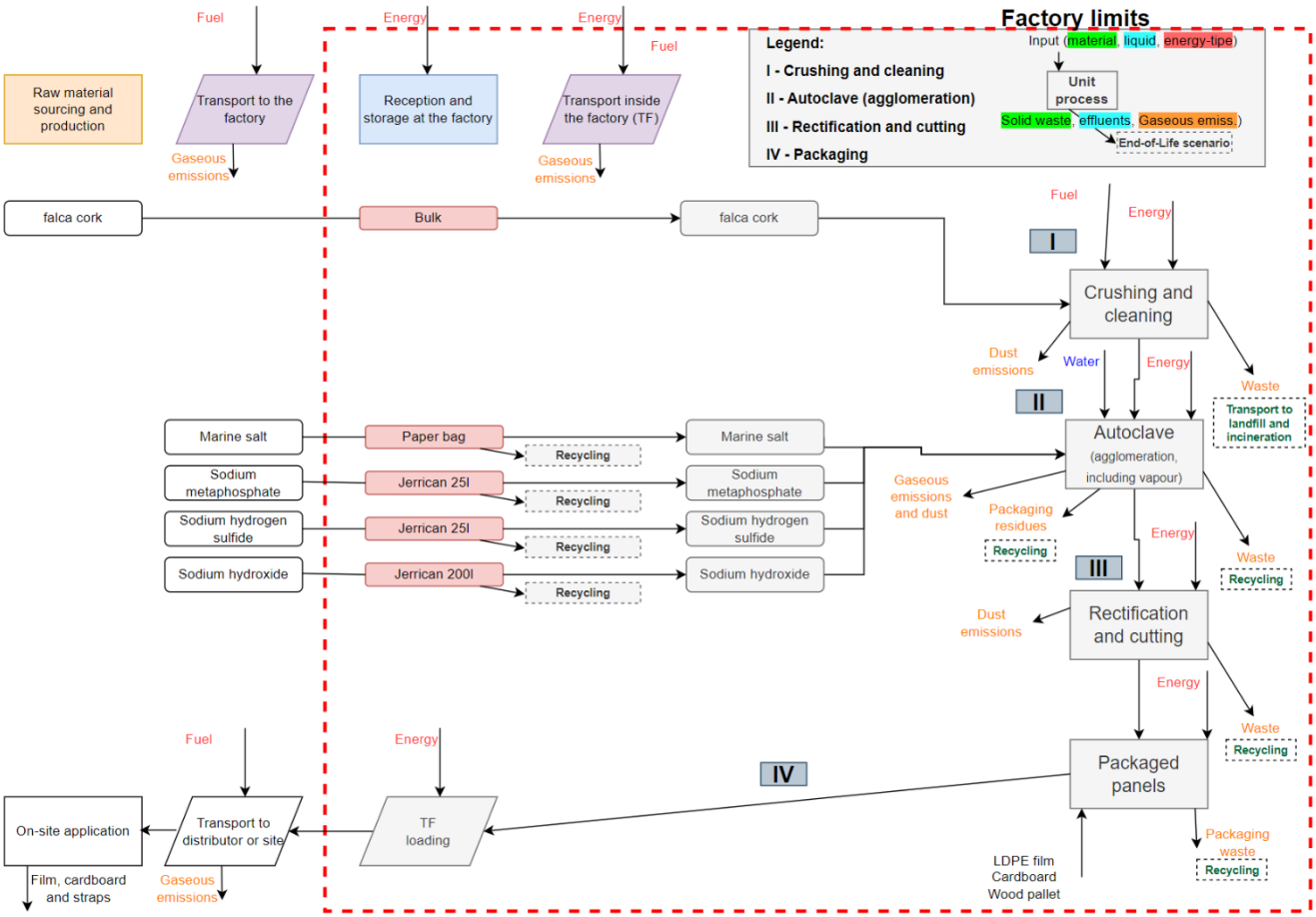

Figure 1: Production system considering the ICB panel manufacturing processes analysed (Flowchart of the process studied in the LCA at the Telhado unit), covering the life cycle and unit processes of the product.

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 and 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
✓	✓	✓	ND	ND	ND	ND	ND	ND	ND	ND	ND	✓	✓	✓	✓	✓

The following paragraphs provide a concise description of the life cycle stages analysed in the development of this EPD:

Initial Phase

The initial stage involves the debarking process (separating cork from wood), where it is assumed that the cork is separated from branches using a stationary diesel-powered machine.

Transport to the Factory

Next, the raw material is transported to the factory using appropriate transport methods, typically by truck.

Packaging Material Production and Transport

In parallel, packaging materials are produced and transported to the Sofalca industrial facility, including: Low-density polyethylene (LDPE) film; Wooden pallets; and Corrugated cardboard.

The impacts associated with these materials (raw materials, transport, and waste generation) are duly considered.

Procurement of Other Raw Materials

Additionally, other raw materials used in the production process are acquired, with their direct production impacts, transport emissions, and waste generation also accounted for.

ICB Panel Production Process at the Sofalca Industrial Unit.

The ICB panel production process consists of various phases, summarised below:

Internal Transport

Cork is transported from the storage yard (where it was deposited by suppliers) to the crushing feed system. This is done using a small backhoe loader, and fuel consumption is recorded.

Crushing and Cleaning

At this stage, falca cork (raw material) enters the production process and passes through a series of crushers and sieves. This process consumes both cork and electricity and generates: Cork granules that continue in the production process; Biomass, which is burned throughout the production process; Soil/sand residues, which are deposited in surrounding areas.

Steam Production

Steam is required for binding the cork granules. It is generated in a dual-heating boiler. The furnace is fuelled by biomass registered internally, including: "Black dust" produced during the trimming and cutting stages; "Cork dust" from the crushing and cleaning stage.

Emissions are monitored biannually by an independent laboratory. Ash, another by-product of the furnace, is weighed and recorded internally.

The boiler is also supplied with water extracted from an on-site borehole, along with pH adjusters and other chemical agents, which are accounted for. The process also consumes electricity, mainly for water pumps.

Autoclaves – Agglomeration and Stabilisation

The autoclaves are fed with cork granules from previous processes. Steam at approximately 380°C is injected into them.

When the autoclave is opened, the outputs are: Blocks of agglomerated cork; Gaseous emissions, which are monitored similarly to the boiler emissions.

The blocks are cut and cooled using a water bath (with recirculation in the autoclaves). They are then manually placed under a shelter to cool and stabilise for at least 15 days.

Internal Transport

After stabilisation, the agglomerated blocks are transported by tractor to the cutting area.

Rectification and Cutting

At this stage, the blocks are rectified to standard dimensions of 1000 mm x 500 mm x required thickness (mm) and are cut into panels, according to customer or order specifications. Inputs: Stabilised blocks; and Electricity. Additionally, metal parts (saws) are used in the regular maintenance of cutting equipment. Outputs: ICB panels; Agglomerate waste from the trimming process or damaged panels; Metal components (from saw blade replacements). The ICB panels are now ready for packaging and will be transported again.

The allocation between ICB and the agglomerate waste that re-enters the production system follows a mass allocation method.

Dust Removal

The air in the rectification and cutting area is filtered, generating particles. This process has been modelled based on recent periodic monitoring.

ICB Packaging

The ICB panels are packaged, mainly using LDPE film and heat sealing. For certain customer requirements, some ICB panels are packaged in corrugated cardboard boxes.

For shipment, the ICB panels are placed on wooden pallets (Euro pallets).

Internal Transport (Shipping)

The final step is the internal transport of packaged ICB panels for shipment.

End-of-Life Stage and Potential Benefits Beyond the System Boundary

Finally, the impacts associated with the end-of-life stage and the potential benefits beyond the system boundary have been considered.

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	-2.85E+02	2.98E+01	-3.15E+02	1.96E-01	7.10E-07	7.32E-01
Module C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C2	1.05E+00	1.05E+00	9.55E-04	5.13E-04	2.30E-08	4.34E-03
Module C3	2.33E+02	1.02E+00	2.32E+02	3.44E-04	4.99E-08	3.39E-02
Module C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module D	-3.07E+01	-3.05E+01	-2.98E-02	-1.71E-01	-1.06E-06	-9.68E-02

LEGEND: Units expressed by declared unit.

Product stage

End of life stage

Benefits and loads beyond the system boundary

	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	Unit	kg N eq.	mol N eq.	Kg COVNM eq.	kg Sb eq.	MJ, P.C.I	m3 World eq. deprived
Modules A1-A3	4.58E-03	3.35E-01	3.66E+00	9.15E-01	1.58E-04	4.83E+02	3.97E+01
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	8.45E-06	1.64E-03	1.77E-02	6.36E-03	3.39E-06	1.50E+01	6.10E-02
Module C3	1.98E-05	1.60E-02	1.83E-01	4.85E-02	2.43E-06	1.02E+01	2.82E-01
Module C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module D	-4.47E-04	-1.65E-02	-1.86E-01	-7.80E-02	-3.34E-05	-4.51E+02	-6.85E+00

LEGEND: Units expressed by declared unit.

Product stage

End of life stage

Benefits and loads beyond the system boundary

"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	Disease incidence	kBq U 235 eq.	CTUe	CTUh	CTUh	-
Modules A1-A3	3.03E-06	9.80E-01	5.63E+02	6.75E-08	8.17E-06	1.35E+05
Module C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C2	8.57E-08	7.50E-03	7.12E+00	4.79E-10	1.05E-08	8.91E+00
Module C3	2.75E-07	1.12E-02	1.30E+01	3.24E-08	6.32E-08	2.92E+00
Module C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module D	-3.71E-07	-6.41E-01	-2.98E+01	-6.65E-09	-1.20E-07	-5.58E+01

LEGEND:

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

Units expressed by declared 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	5.31E+04	4.75E+01	5.31E+04	4.60E+02	2.27E+01	4.83E+02
Module C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C2	2.33E-01	0.00E+00	2.33E-01	1.49E+01	0.00E+00	1.49E+01
Module C3	4.73E-01	0.00E+00	4.73E-01	1.02E+01	0.00E+00	1.02E+01
Module C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module D	-1.00E+02	0.00E+00	-1.00E+02	-4.51E+02	0.00E+00	-4.51E+02

LEGEND:

Product stage

End of life stage

Benefits and loads beyond the system boundary

Units expressed by declared unit.

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);

	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	0.00E+00	0.00E+00	0.00E+00	9.35E-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	2.13E-03
Module C3	0.00E+00	0.00E+00	0.00E+00	5.27E-02
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	-1.42E-01

LEGEND:

Product 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.

Units expressed by declared unit.

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	2.08E-03	9.98E+01	6.83E-04
Module C1	0.00E+00	0.00E+00	0.00E+00
Module C2	9.53E-05	7.31E-01	4.86E-06
Module C3	5.48E-05	1.20E+00	7.18E-06
Module C4	0.00E+00	0.00E+00	0.00E+00
Module D	-1.67E-03	-1.17E+00	-4.40E-04

LEGEND:

Product stage

End of life stage

Benefits and loads beyond the system boundary

Units expressed by declared unit.

The characteristics that classify waste as hazardous are defined in the applicable legislation in force, such as the European Waste Framework Directive.

2.6. 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	3.02E+01	3.74E+01	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	0.00E+00	1.10E+02	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	4.52E+02

LEGEND:

Units expressed by declared unit.

Product stage

End of life stage

Benefits and loads beyond the system boundary

The characteristics that classify waste as hazardous are defined in the applicable legislation in force, such as 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 product	Kg C	8.59E+01
Biogenic carbon content in accompanying packaging	Kg C	1.66E+00

* 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 C1 Demolition – End-of-Life Stage

Parameter	Units/comments	Results expressed per declared unit
		Scenario C1.1
Scenario	Name and description of the scenario	Selective demolition of the ICB panels from a building, considering manual removal due to their nature.
Related Scenario	Names of scenarios linked to this scenario	C2.1
Material collected separately	kg	110 (avg. density = 110 kg/m^3)
Material collected and mixed with construction waste	kg	-
Additional considerations	Appropriate units	-

3.2. Module C2 Transport – End-of-Life Stage

Parameter	Units/comments	Results expressed per declared unit
		Scenario C2.1
Scenario	Name and description of the scenario	Transport of waste from these panels from the demolition site to the energy recovery facility.
Related Scenario	Names of scenarios linked to this scenario	C1.1, C3.1
Type of fuel, fuel consumption, type of vehicle used for transport (e.g., long-distance truck, ship, etc.)	Litres of fuel type per distance or type of vehicle**	Ecoinvent 3 process “Transport, freight, lorry 16-32 metric ton, EURO4 {RER}| transport, freight, lorry 16-32 metric ton, EURO4	Cut-off, S”
Distance	km	Average distance: 30 km.
Container capacity (including return trip with no load)	% (payload)	100%, considering empty return
Density of transported products	kg/m^3	110
Volume capacity factor (factor = 1, <1, or >1 for compressed or packaged products)	Not applicable	NA
Additional considerations	Appropriate units	-

** Commission Directive 2007/37/EC (European Emission Standard)

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

Parameter	Units/comments	Results expressed per declared unit
		Scenario C3.1
Scenario	Name and description of the scenario	Waste processing for energy recovery.
Related Scenario	Names of scenarios linked to this scenario	C2.1 e D.1
Material for reuse	kg	-
Material for recycling	kg	-
Material for energy recovery	kg	110 (Avg. density: 110 kg/m^3)
Additional considerations	Appropriate units	-

3.4. C4 Disposal – End-of-Life Stage

Parameter	Units/comments	Results expressed per declared unit
		Scenario C4.1
Scenario	Name and description of the scenario	NA (completely into module D)
Related Scenario	Names of scenarios linked to this scenario	NA
Material for final disposal	kg	NA
Final considerations	Appropriate units	-

3.5. Scenarios and Technical Information for Module D

Parameter	Units/comments	Results expressed per declared unit
		Scenario D.1
Scenario	Name and description of the scenario	Energy recovery benefit in module C3 for ICB panel waste, contributing to these interventions.
Related Scenarios	Names of scenarios linked to this scenario	C3.1
Net output flow specified by material	Appropriate units	110
Avoided production	Appropriate units	Electricity -150.70 MJ/$m^{3;}$ heat generation -301.40 MJ/m^3
End-of-waste status location	Not applicable	-
Functional equivalence point	Not applicable	-
Considerations	Appropriate units	-

3.6. Additional Environmental Information on the Release of Hazardous Substances to Air, Soil, and Water During the Use Stage

Not Applicable.

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 (in 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 16783:2024 – Thermal insulation products – Environmental Product Declarations (EPD) – Product Category Rules (PCR) complementary to EN 15804 for factory made and in-situ formed products;

✓ EN 15942:2021 Sustainability of construction works – Environmental product declarations – Communication format business-to-business.