Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

HARDBOARD

Multiple products EPD based on a representative product (Representative: Hardboard, Hardboard water-based coated, and other included products: Hardboard moisture-resistant plus and Hardboard special finishes).

from

BETANZOS HB

Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	Multiple products EPD from a company.
EPD registration number:	EPD-IES- 0031916:001
Version date:	2026-05-22
Validity date:	2031-05-21
	An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

GENERAL INFORMATION

Programme Information	
Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	support@environdec.com

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14. Construction products (EN 15804+A2) Version 2.0.1;
c-PCR: c-PCR-006 Wood and wood-based products for use in construction (EN 16485)
PCR review panel: The Technical Committee of the International EPD System. A full list of members is available on www.environdec.com. The review panel may be contacted via support@environdec.com. Members of the Technical Committee were requested to state any potential conflict of interest with the PCR Committee, and if there were conflicts of interest they were excused from the review.
Chairs of the PCR review: Rob Rouwette (chair), Noa Meron (co-chair).

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ **Individual EPD verification without a pre-verified LCA/EPD tool** Third-party verifier: Elisabet Amat Approved by: International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.
Please note: EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: Betanzos HB.
Address: Carretera Betanzos-Santiago, Cño. Real da Infesta, Km 3, 15300 Betanzos, A Coruña.
Name: Rosa Arcas.
Position: Responsible of I+D.
Contact: rarcas@betanzoshb.es
Description of the organisation: BETANZOS HB is a manufacturer specialised in high-density fibreboard (Hardboard), operating with a long-standing industrial tradition in the transformation of lignocellulosic materials. The company focuses on the efficient use of sustainably sourced wood fibres to produce boards for applications in construction, furniture, packaging, and various industrial uses. Its production system is based on energy-efficient technologies, optimisation of biomass utilisation, reduction of waste generation, and control of atmospheric emissions. Betanzos HB places strong emphasis on continuous environmental improvement, resource efficiency, and responsible management throughout the entire value chain. The organisation integrates sustainability principles in its operations, promoting the use of renewable raw materials and ensuring traceability across its supply chain.
Product-related or management system-related certifications: Betanzos HB operates under certified management systems that ensure consistent product quality, robust environmental control and responsible sourcing practices. The company's processes are supported by an ISO 9001 quality management framework, which guarantees that production is carried out under controlled conditions and aligned with recognised standards of operational excellence. In parallel, its environmental performance is structured around an ISO 14001 environmental management system, which enables the organisation to systematically identify and manage the environmental aspects associated with its activities.
In addition, the company maintains chain-of-custody certifications such as FSC® or PEFC™ (when applicable), ensuring that the wood used originates from sustainably managed forests and that traceability is preserved from source to final product. All sustainability-related information disclosed in this EPD has been prepared in accordance with the requirements established in Sections 6.4.8 and 6.4.9 of PCR 2019:14, ensuring accuracy, neutrality, verifiability and full consistency with the information submitted through the EPD Portal.
Product-related or management system-related certifications:

- ISO 9001 – Quality Management System
- ISO 14001 – Environmental Management System
- ISO 45001 – Occupational Health & Safety Management System
- FSC® Chain of Custody Certification
- PEFC™ Chain of Custody Certification
- SURE – Biomass Sustainability Certification

Name and location of production site(s): Betanzos HB – Carretera Betanzos–Santiago de Compostela, Km 3, 15300 Betanzos, A Coruña, Spain. This EPD covers 100% of the hardboard (HB) produced by Betanzos HB at its production site in Betanzos, A Coruña (Spain).
Address and contact information of the LCA practitioner commissioned by the EPD owner: Gonzalo Amador (gonzalo.amador@aitex.es) and Carles Llopis (carles.llopis@aitex.es).

PRODUCT INFORMATION

Product name: Board HB.
Product identification: Hardboard (HB) according to EN 316 and EN 622-2, including the most representatives: Hardboard uncoated, Hardboard water-based coated, and other types: Hardboard moisture-resistant plus and Hardboard special finishes
Visual representation of the product:

UN CPC code: 3143
Product description: The product covered by this EPD is a high-density fibreboard (Hardboard) manufactured from wood fibres obtained from sustainably managed forest resources. It is produced through a wet-process technology in which the fibres are disintegrated, homogenised and formed into a continuous mat, which is subsequently pressed under high temperature and pressure to achieve the required density, mechanical strength and dimensional stability. The resulting board exhibits a uniform structure, good load-bearing capacity, high bending strength and a smooth, compact surface suitable for further processing such as coating, laminating or machining.
The product is primarily intended for applications in the construction and furniture sectors, where it may serve as an interior cladding material, backing board, packaging component or structural element in lightweight assemblies. Its performance contributes to the operational characteristics of buildings by providing stability, durability and compatibility with a wide variety of construction systems. As a wood-based panel, the board stores biogenic carbon during its use phase and therefore may influence the overall carbon balance of the building, subject to the assumptions defined in the PCR.
The manufacturing process is based entirely on the transformation of lignocellulosic materials without the addition of synthetic binders, relying instead on the natural bonding capacity of wood fibres. The technical service life of the board depends on its final application and exposure conditions, but in typical indoor uses it can be equivalent to the lifetime of the building element in which it is installed.

Website: https://www.betanzoshb.es

Product specifications:

EPD characteristic	Hardboard	Hardboard moisture-resistant plus	Hardboard water-based coated	Hardboard special finishes
Structural use	Non-structural	Non-structural	Non-structural	Non-structural
Use environment	Dry (HB)	Dry or humid (HB / HB.H)	Dry	Dry (some suitable for HB.H)
Wood origin	Spain (>99% Galicia)	Spain (>99% Galicia)	Spain (>99% Galicia)	Spain (>99% Galicia)
Synthetic adhesives	No (natural lignin)	No (natural lignin)	No in base board	No (natural lignin)
Nominal density	≥ 900 kg/m³	≥ 940–1000 kg/m³ (depending on thickness)	≥ 900 kg/m³	≥ 900 kg/m³
Typical thickness range	2.0 – 6.4 mm	3.2 – 6.4 mm	2.5 – 6.0 mm	2.5 – 5.4 mm
Thickness swelling 24 h (EN 317)	≤ 25–37 %	≤ 20–25 %	≤ 25–37 %	≤ 30–37 %
Bending strength (EN 310)	≥ 30 N/mm²	≥ 30–35 N/mm²	≥ 30 N/mm²	≥ 30 N/mm²
Internal bond strength (EN 319)	≥ 0.50 N/mm²	≥ 0.60 N/mm²	≥ 0.50 N/mm²	≥ 0.50 N/mm²
Surface treatment	Untreated	Hydrophobic / tempered	Water-based paint + UV	Perforated / hydrophobic / technical finishes
Formaldehyde emissions	Class E1 (EN 13986)	Class E1 (EN 13986)	Class E1 (base board)	Class E1 (EN 13986)
Certifications	CE, EN 13986, ISO 9001/14001/45001/50001, PEFC/FSC	CE, EN 13986, ISO, PEFC/FSC	CE, EN 13986, ISO, PEFC/FSC	CE, EN 13986, ISO, PEFC/FSC
Additional functions	Basic panelling	High durability and stability	Aesthetic function	Acoustic performance, ventilation, decoration

CONTENT DECLARATION

The content declaration is based on the representative product (1 m^3). The values reported correspond to the basic hardboard. Other included product variants may contain additional materials related to surface treatments or finishes (e.g. coatings, paints or varnishes) which represents in mass less than 5%; these differences are addressed as product variations.

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Eucalyptus Wood	2230	0	100	1069.21
TOTAL	2230	0	100	1069.21

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Printed paper	0.062	0.003	0.028
EUR-flat pallet	0.001	0.000	0.000
Corrugated board box	0.124	0.010	0.056
Packaging film, low density polyethylene	0.047	0.002	0.000
Polyethylene terephthalate, granulate, amorphous	0.305	0.014	0.000
Plywood	0.026	0.001	8.187
Steel, chromium steel 18/8	0.070	0.003	0.000
TOTAL	0.635	0.030	8.271

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO_2.

The products do not contain substances included in the Candidate List of Substances of Very High Concern (SVHC) in accordance with Regulation (EC) No. 1907/2006 (REACH) in concentrations exceeding 0,1% by weight. Furthermore, during their life cycle, no substances exceeding the limits established by current European legislation on human health and the environment are used or generated.

LCA INFORMATION

Declared unit: 1 m^3 of board HB.
Conversion factor to mass: 2,23 tonnes / m^3.
Time representativeness: Data for the study was collected from the Betanzos HB production site and represents the year 2025. The data includes raw material supply, transport distances, fuels, energy consumption, packaging, hardboard (HB) production, by-products, and waste generated at the facility.
Geographical scope: Spain, Europe, Global
Database(s) and LCA software used: The life cycle assessment was modelled using SimaPro v10.2, integrating datasets from the Ecoinvent 3.11 database (cut-off system model). These data sources ensure methodological consistency with EN 15804+A2 and PCR 2019:14.
Description of system boundaries:
Cradle-to-gate with options, modules C1-C4, module D and optional modules A4-A5.

A1–A3 (Product stage – Raw material supply, transport and manufacturing): Includes the supply of all raw materials, internal processing of wood fibres, transport of inputs to the production site, and all manufacturing operations (defibration, wet-mat forming, pressing, drying, trimming and finishing). Energy use, water use, emissions, waste generation and treatment within the plant is included.

A4–A5 (Construction stage – Transport and installation): A4 includes transport of the product to the construction site based on the modelled transport distances and modes. A5 includes handling of packaging waste during installation. The product does not require energy, water or auxiliary materials for installation.

C1–C4 (End-of-life stage – Deconstruction, transport, treatment and disposal): C1 includes diesel use for manual/mechanical deconstruction; C2 covers transport of wood waste to treatment; C3 includes waste processing for wood waste (shredding, sorting, energy inputs); C4 includes final disposal of remaining fractions in landfill.

Module D (Benefits and loads beyond the system boundary): Module D reports the net benefits associated with the energy recovery and other recyclable flows that have passed the end-of-waste state, following EN 15804+A2 and the “polluter pays principle”. For conservative modelling purposes, a 50% efficiency was assumed for both electricity and thermal energy recovery in Module D.

Variation between declared products (PCR 2019:14, 4.6.5.2): This EPD covers one basic hardboard and three finished variants (Hardboard water-based coated, Hardboard moisture-resistant plus and Hardboard special finishes). The A1–A3 processes share the same general manufacturing structure; however, the different finishes (Hardboard uncoated, Hardboard water-based coated, Hardboard moisture-resistant plus and Hardboard special finishes) result in variations in energy use, auxiliary materials and specific process inputs. These differences are transparently reported in the following sections for the indicators where variations exceed 10% compared with the basic board.

This EPD follows a cradle-to-gate with options system boundary including modules A1–A3, A4–A5, C1–C4 and D, in accordance with EN 15804+A2 and PCR 2019:14.
Use-stage modules B1–B7 are declared as MND, as the product does not require energy, water, maintenance or replacement during use.

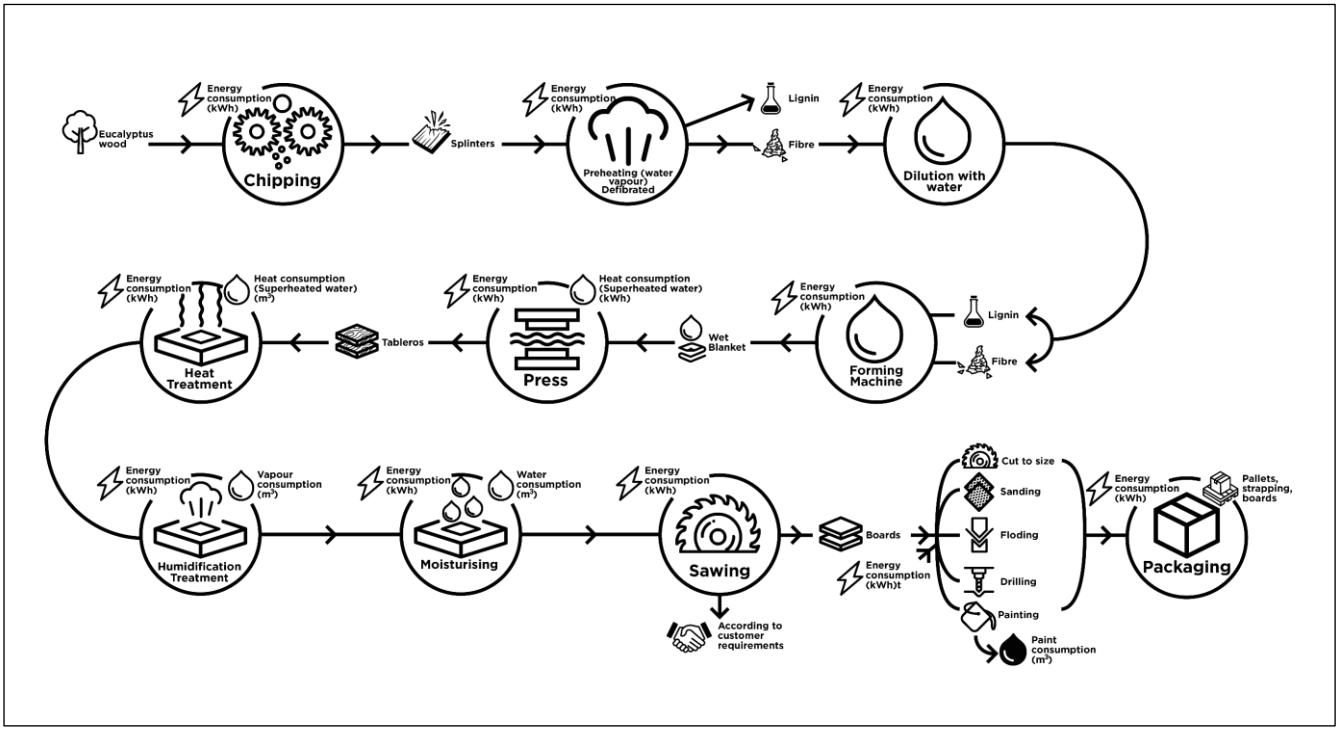
Cut-Off Rule: A cut-off rule of 1% has been applied in accordance with EN 15804+A2 and PCR 2019:14. Individual material and energy flows that contribute less than 1% of the total mass or energy of the declared unit may be excluded, provided that their exclusion does not significantly influence the overall results. The total amount of neglected flows does not exceed 5% of the total inputs.

No known hazardous or environmentally relevant flows have been excluded.
Where specific data were unavailable for processes with potential environmental relevance, conservative assumptions based on upper-bound values were applied to avoid underestimation of impacts.

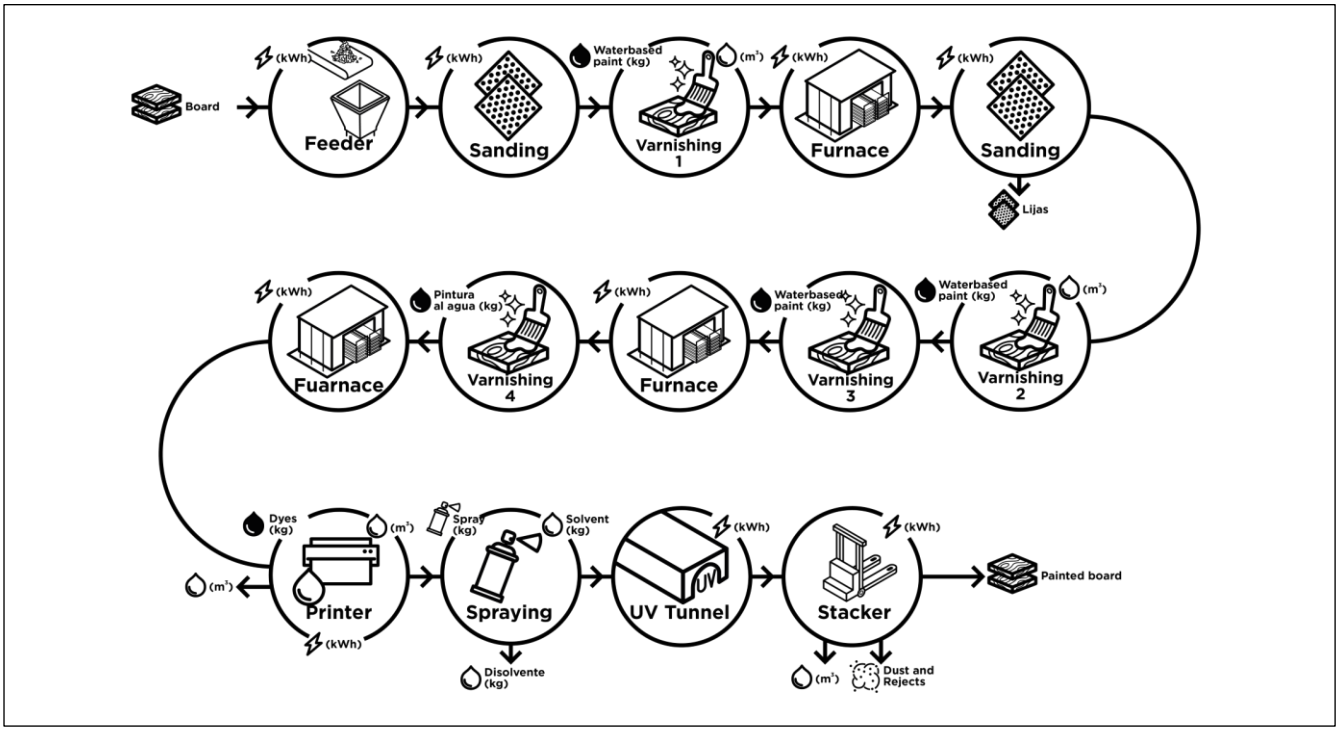
Allocation: In accordance with the PCR criteria, the allocation of system inputs and outputs was based on physical properties (mass). This allocation criterion was applied to auxiliary materials, water, energy, emissions and waste. No by-products are generated in the manufacture of hardboard products. Wood scraps used internally in the same product system as energy source; thereby no co-products leave the product system, and no allocation is necessary.

End-of-life allocation: End-of-life allocation follows the "polluter pays principle" as required by EN 15804+A2. The burdens associated with waste collection, transport, sorting, treatment and disposal (modules C1–C4) are fully assigned to the product system that generates the waste.
Module D includes the net benefits and loads from energy recovery and recycling of material flows that have passed the end-of-waste state.

Process flow diagram: A process flow diagram shall be provided showing the product system divided into its life-cycle stages and modules (or according to the structure defined in the PCR). The diagram must indicate the main processes included in the system and clearly define the system boundaries. It shall also show where the end-of-waste state is reached for any reused or recycled material inputs, as well as for outputs of reused or recycled materials and recovered energy at the end-of-life stage.



The process consists of converting eucalyptus wood into fibers through chipping and defibering, followed by the formation of a wet mat that is pressed and subjected to thermal and humidification treatments. Finally, the boards are cut, finished as required (sanding, painting, drilling), and packaged for distribution.



The finishing process consists of sanding the board and applying successive coats of water-based varnish, followed by oven drying stages, until the required surface quality is achieved. Subsequently, the board may undergo printing, lacquering, and curing in a UV tunnel, ending with stacking and waste management to obtain the painted product

More information:

Data quality assessment (EN 15941): The data quality assessment follows the requirements of EN 15941, evaluating the temporal, geographical and technological representativeness, as well as the accuracy of all datasets.

- Temporal representativeness: Primary data for modules A1–A3 correspond to the 2025 operational year, fully within the <10-year requirement defined in EN 15941. Background datasets from Ecoinvent 3.11(2019–2025) also comply with the required age limits.
- Geographical representativeness: Foreground data originate from the Betanzos HB production site in A Coruña (Spain). Background datasets were selected to match European/Spanish conditions whenever available (e.g., ES residual electricity mix), ensuring consistency with the geographical scope of the product system.
- Technological representativeness: Collected primary data reflect the actual technologies and processes used at the plant (wet-process fibreboard production, defibration, mat forming, pressing, drying). Background datasets from Ecoinvent were selected to represent equivalent industrial technologies.
- Accuracy and completeness: Foreground data were directly measured or recorded by the manufacturer and cross-checked for completeness and internal consistency. All relevant material and energy flows were included, and no significant data gaps remain. Background datasets are classified as “good” to “very good” according to EN 15941 criteria data sources, reference years and primary data share: The LCA model was developed using SimaPro 10.2 with Ecoinvent 3.11. The overall share of primary data contributing to the GWP-GHG results of modules A1–A3 is 35 %, in line with PCR Section 4.6.4. The detailed breakdown of data sources and primary-data contribution is provided in the corresponding table of this EPD.

Infrastructure and capital goods: Infrastructure and capital equipment are excluded from the system boundaries, as permitted by PCR Section 4.3.6, because their contribution is expected to fall below cut-off thresholds and would not significantly influence the results.

Climate impact of purchased electricity (A3): Electricity used in manufacturing (module A3) is modelled using market-based approach.

Downstream scenarios (C1–C4 and module D): End-of-life modelling is based on default PCR-compliant scenarios for construction products, including demolition, transport, sorting, energy recovery and disposal. Module D reports potential benefits and loads associated with energy recovery beyond the system boundary. For the energy recovery scenario in Module D, conservative assumptions were applied, considering a 50% efficiency for both recovered electricity and recovered thermal energy.

Modules declared, geographical scope, share of primary data (in GWP-GHG results) and data variation (in GWP-GHG results):

Modules/processes/life-cycle stages declared shall be noted with “X”.
Modules/processes/life-cycle stages not declared shall be marked as “ND”.

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU	EU	ES	GLO	GLO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GLO	GLO	GLO	GLO	GLO
Share of primary data	35 %			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation* – products	63%***			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation ** – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Variation regarding the average EPD result in terms of GWP-GHG indicator amongst products covered with this EPD

** Variation regarding the average EPD result in terms of GWP-GHG indicator

*** The maximum variation from the average EPD result for the GWP-GHG indicator among the products covered by this EPD is 63%

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Raw material supply	Collected data	Betanzos HB plant data	2025	Secondary data	0%
Manufacturing processes	Collected data	Betanzos HB plant data	2025	Primary + secondary data	35%
Electricity used in manufacturing	Database	Ecoinvent 3.11 (ES residual mix) + Guarantee-of-Origin	2025	Secondary data	0%
Transport of raw materials to plant (A2)	Database	Ecoinvent 3.11	2025	Secondary data	0%
Packaging materials	Collected + database	Betanzos HB + Ecoinvent	2025	Primary + secondary	0%
Other background processes	Databases	Ecoinvent 3.11	2019–2025	Secondary data	0%
Total share of primary data, of GWP-GHG results for A1-A3					35%

Transport to the building site (A4):

Scenario information	Value	Unit
Means of Transport-truck	Transport, freight, lorry 16-32 metric ton, EURO5	Dimensionless
Means of Transport-Container ship	Transport, freight, sea, container ship	Dimensionless
Transport distance-truck*	791,96	km
Transport distance-Container ship*	2574,34	km
Gross density of products transported	2230	Kg/m^3
Capacity utilisation volume factor	1	-

*Transport in A4 was modelled using a weighted approach. The total mass shipped was divided into road and sea transport shares, and each transport dataset was applied proportionally to its respective percentage. This ensures that the A4 results reflect the real distribution of transport modes used during the reporting year

Installation into the building site (A5): Installation does not require energy, water or auxiliary materials. The only contribution in A5 is the management of inert packaging waste, including its transport to the corresponding treatment route.

Scenario information	Value	Unit
Ancillary materials for installation	0	kg
Water use	0	m^3
Electricity for installation	0	kWh
Waste generated on site (inert packaging)	0.635	kg
Transport of packaging waste	130	km
Output material after waste processing (landfill)	0.635	kg
Direct emissions to air, soil and water	0	kg

Waste treatment route	Percentage (%)
Incineration	100%

End of Life (C1-C4): The end-of-life stage is modelled using standard PCR-compliant scenarios. C1 includes diesel use for dismantling, C2 represents transport to waste treatment, C3 covers energy required for wood-waste processing, and C4 reflects disposal in landfill. All values are taken directly from the LCA model.

Scenario information	Value	Unit
C1 – Deconstruction / demolition		
Diesel consumption for dismantling	2.46	kWh
C2 – Transport to waste processing		
Transport, lorry 16–32 t	130	km
C3 – Waste processing		
Waste Wood to incineration	2.23	t
C4 – Disposal		
Waste wood to landfill	0	t

The end-of-life scenario information for modules C1, C2, C3 and C4 is based on the default parameters and scenarios defined in PCR 2019:14. All values reported in these modules are directly taken from the PCR scenario table and applied consistently in the LCA model, without modification.

The declared end-of-life scenario assumes a 100% incineration with energy recovery.

Data quality assessment: The EPD covers the hardboard manufactured by Betanzos HB during the 2025 reference year. The LCA model is based on specific primary data collected at the manufacturing site and complemented with background datasets from the Ecoinvent 3.11 database. The system is modelled in SimaPro 10.2, following the requirements of EN 15804+A2 and PCR 2019:14. Data quality in terms of temporal, geographical and technological representativeness is consistent with the criteria set out in the PCR, with the relevant datasets assessed as “good” to “very good” and no datasets classified as “poor”. The overall share of primary data contributing to GWP-GHG results in modules A1–A3 is 35 %, reflecting the high level of process-specific information available for the manufacturing stage.

Electricity used in the manufacturing process in A3 (A5 for services):

The 30% supplier-specific renewable electricity (GdO Endesa) + 70% residual electricity mix of supplier based on CNMC adapting the dataset “Electricity, medium voltage, ES residual mix (Ecoinvent 3.11, cut-off)”.

Emission factor for the electricity consumed at the manufacturing site	
Supplier Residual Mix (Electricity sources: 42% renewable, 25% nuclear, 18% natural gas, 15% others)	0,400 kg CO_2 eq / kWh
GoO Supplier (30 % Photovoltaic and wind power)	1,87E-06 kg CO2 eq / kWh
Resulting Manufacturing Plant Mix (70% residual mix + 30% GoO renewable electricity)	0,280 kg CO_2 eq / kWh

ENVIRONMENTAL PERFORMANCE

LCA results of the product(s) - main environmental performance results

Mandatory impact category indicators according to EN 15804

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	-3,78E+03	1,82E+02	3,03E+01	4,00E-01	1,53E+01	3,94E+03	0,00E+00	-1,11E+02
GWP-fossil	kg CO_2 eq.	1,65E+02	1,82E+02	1,01E-02	3,99E-01	1,53E+01	1,54E+01	0,00E+00	-1,11E+02
GWP-biogenic	kg CO_2 eq.	-3,95E+03	1,01E-01	3,03E+01	8,09E-05	1,05E-02	3,92E+03	0,00E+00	-3,68E-01
GWP-luluc	kg CO_2 eq.	2,92E+00	6,59E-02	5,15E-06	4,09E-05	5,05E-03	4,27E-03	0,00E+00	-4,94E-01
ODP	kg CFC 11 eq.	8,31E-06	3,75E-06	2,38E-10	5,93E-09	3,33E-07	1,73E-07	0,00E+00	-3,91E-06
AP	mol H^+ eq.	9,75E-01	1,31E+00	8,27E-05	3,57E-03	4,90E-02	1,62E-01	0,00E+00	-2,13E-01
EP-freshwater	kg P eq.	5,93E-02	1,15E-02	1,08E-05	1,29E-05	1,04E-03	6,96E-03	0,00E+00	-6,33E-03
EP-marine	kg N eq.	2,85E-01	3,70E-01	2,15E-05	1,66E-03	1,65E-02	8,59E-02	0,00E+00	-5,77E-02
EP-terrestrial	mol N eq.	2,76E+00	4,07E+00	2,34E-04	1,82E-02	1,79E-01	8,25E-01	0,00E+00	-6,01E-01
POCP	kg NMVOC eq.	1,18E+00	1,36E+00	8,56E-05	5,44E-03	7,43E-02	2,07E-01	0,00E+00	-2,61E-01
ADP-minerals&metals*	kg Sb eq.	7,03E-04	5,47E-04	2,41E-08	1,43E-07	5,14E-05	2,71E-05	0,00E+00	-8,43E-05
ADP-fossil*	MJ	3,96E+03	2,53E+03	1,97E-01	5,20E+00	2,16E+02	1,38E+02	0,00E+00	-2,40E+03

WDP*	m^3	2,71E+02	9,25E+00	-9,66E-02	1,11E-02	8,39E-01	6,46E+00	0,00E+00	-3,90E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption								

Additional mandatory and voluntary impact category indicators

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG[1]	kg CO_2 eq.	1,86E+02	1,81E+02	1,00E-02	3,97E-01	1,52E+01	1,52E+01	0,00E+00	-1,11E+02
HT-c	CTUh	1,83E-07	3,20E-08	3,17E-12	4,06E-11	2,59E-09	2,90E-08	0,00E+00	-1,64E-08
HT-nc	CTUh	1,58E-06	1,44E-06	1,46E-10	6,39E-10	1,35E-07	1,95E-06	0,00E+00	-2,34E-07
ET-f	CTUe	1,54E+02	1,17E+01	1,00E-03	2,35E-02	9,67E-01	8,72E-01	0,00E+00	-4,77E+00
LU	Pt	3,21E+04	1,32E+03	3,79E-01	3,45E-01	1,28E+02	3,89E+01	0,00E+00	-1,69E+02
PM	disease inc.	1,79E-05	1,31E-05	1,37E-09	1,02E-07	1,22E-06	1,82E-06	0,00E+00	-1,20E-06
IR	kBq U-235 eq	1,05E+02	2,75E+00	1,71E-04	2,22E-03	2,58E-01	1,58E-01	0,00E+00	-4,25E+01
Acronyms	GWP-GHG: Global Warming Potential, greenhouse gases (kg CO_2 eq); HT-c: Human toxicity, cancer effects (CTUh); HT-nc: Human toxicity, non-cancer effects (CTUh); ET-f: Freshwater ecotoxicity (CTUe); LU: Land use (Pt); PM: Particulate matter, disease incidence; IR: Ionizing radiation, human health (kBq U-235 eq)								
Disclaimer 1	This impact category deals only with ionizing radiation from the nuclear fuel cycle. It does not consider effects from radon, natural background radiation, or radioactive waste disposal in underground facilities								
Disclaimer 2	The results of these environmental impact indicators shall be used with care, as the uncertainties associated with these indicators are high or there is limited experience with their use.								

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Resource use indicators

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	5,67E+04	3,69E+01	2,62E-03	3,19E-02	3,41E+00	3,47E+00	0,00E+00	-3,54E+02
PERM	MJ	2,56E+04	0,00E+00	-3,07E+02	0,00E+00	0,00E+00	-2,53E+04	0,00E+00	0,00E+00
PERT	MJ	8,22E+04	3,69E+01	-3,07E+02	3,19E-02	3,41E+00	-2,53E+04	0,00E+00	-3,54E+02
PENRE	MJ	3,96E+03	2,53E+03	1,97E-01	5,20E+00	2,16E+02	1,38E+02	0,00E+00	-2,40E+03
PENRM	MJ	9,00E+00	0,00E+00	-9,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	3,97E+03	2,53E+03	-8,80E+00	5,20E+00	2,16E+02	1,38E+02	0,00E+00	-2,40E+03
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	6,28E+00	2,97E-01	-2,24E-03	3,67E-04	2,70E-02	2,02E-01	0,00E+00	-5,90E-01
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water								

Waste indicators

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,46E-01	1,67E-02	1,39E-06	3,62E-05	1,47E-03	8,67E-04	0,00E+00	-8,91E-03
Non-hazardous waste disposed	kg	4,21E+01	1,05E+02	6,11E-01	3,52E-03	1,04E+01	1,77E+01	0,00E+00	-2,91E+00
Radioactive waste disposed	kg	2,45E-02	6,79E-04	4,21E-08	5,44E-07	6,36E-05	3,94E-05	0,00E+00	-1,00E-02

Output flow indicators

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	0	0	0	0	0	0
Materials for energy recovery	kg	0	0	6,11E-01	0	0	2,23E+01	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0

Variation – products

This EPD covers one basic hardboard product and different finished variants (Hardboard water-based uncoated, Hardboard water-based coated, Hardboard moisture-resistant plus and Hardboard special finishes). According to PCR 2019:14 requirements, variations above 10% relative to the basic board have been assessed and are declared below for the indicators affected.

This EPD covers one representative product (Hardboard water-based uncoated) and three finished variants (Hardboard water-based coated, Hardboard moisture-resistant plus and Hardboard special finishes). Variations above 10% observed between the declared products are mainly driven by differences in finishing and surface treatment processes.

Finished products require additional manufacturing steps in module A3, including coating application, drying and curing operations, as well as the use of auxiliary materials associated with surface treatments. These additional processes result in increased electricity consumption, higher use of specific chemicals and auxiliary products, and additional waste generation compared to the uncoated hardboard.

Consequently, impact categories directly linked to energy use, fossil resource consumption and emission-intensive processes (such as GWP-fossil, ADP-fossil, acidification and eutrophication indicators) show higher relative variations when compared to the representative product.

The Hardboard moisture-resistant plus shows only limited variations, as the additional treatment applied is minor and does not significantly alter the overall material and energy balance of the production process.

Indicators showing similar variation patterns are affected by the same underlying process changes and are therefore explained jointly rather than individually, in accordance with PCR 2019:14 requirements. The observed variations reflect actual technological differences between product variants and do not indicate modelling inconsistencies.

The uncoated hardboard is used as the representative product. All variations are expressed as percentage differences relative to the representative product and refer to modules A1–C4.

Comparative results			
Indicator	**Variation (%) vs. Hardboard uncoated (Hardboard water-based coated)**	**Variation (%) vs. Hardboard uncoated (Harboard moisture-resistant plus)**	**Variation (%) vs. Hardboard uncoated (Harboard specials finishes)**
GWP-total	4%	66%	39%
GWP-fossil	4%	64%	46%
GWP-biogenic	-3%	0%	-197%
GWP-LULUC	0%	157%	62%
GWP-GHG	4%	63%	44%
ODP	3%	44%	46%
AP	2%	72%	22%

EP-freshwater	1%	58%	24%
EP-marine	2%	41%	25%
EP-terrestrial	2%	25%	22%
POCP	2%	33%	23%
ADP-minerals&metals	3%	51%	29%
ADP-fossil	4%	68%	54%
WDP	0%	43%	10%

ABBREVIATIONS

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EPD	Environmental Product Declaration
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
PCR	Product Category Rules
c PCR	Complementary Product Category Rules
CEN	European Committee for Standardization
EN	European Norm (Standard)
EPD	Environmental Product Declaration
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
PCR	Product Category Rules
c PCR	Complementary Product Category Rules
Environmental Impact Indicators (EN 15804)	
GHG	Greenhouse gas
GWP	Global Warming Potential (kg CO_2 eq)
GWP fossil	GWP from fossil sources (kg CO_2 eq)
GWP biogenic	GWP from biogenic sources (kg CO_2 eq)
GWP luluc	GWP from land use and land use change (kg CO_2 eq)
GWP total	Total Global Warming Potential (kg CO_2 eq)
GWP GHG	GWP for greenhouse gases (kg CO_2 eq)
ODP	Ozone Depletion Potential (kg CFC 11 eq)
AP	Acidification Potential (mol H^+ eq)
EP	Eutrophication Potential
EP freshwater	Freshwater eutrophication (kg P eq)
EP marine	Marine eutrophication (kg N eq)
EP terrestrial	Terrestrial eutrophication (mol N eq)
POCP	Photochemical Ozone Creation Potential (kg NMVOC eq)
ADP	Abiotic Depletion Potential
ADP minerals & metals	Abiotic depletion of mineral/metal resources (kg Sb eq)
ADP fossil	Abiotic depletion of fossil resources (MJ)

WDP	Water Deprivation Potential (m^3)
GHG	Greenhouse gas
GWP	Global Warming Potential (kg CO_2 eq)
GWP fossil	GWP from fossil sources (kg CO_2 eq)
GWP biogenic	GWP from biogenic sources (kg CO_2 eq)
GWP luluc	GWP from land use and land use change (kg CO_2 eq)
GWP total	Total Global Warming Potential (kg CO_2 eq)
Resource Use Indicators	
PERE	Renewable primary energy (excluding raw materials) (MJ)
PERM	Renewable primary energy as raw material (MJ)
PERT	Total renewable primary energy use (MJ)
PENRE	Non renewable primary energy (excluding raw materials) (MJ)
PENRM	Non renewable primary energy as raw material (MJ)
PENRT	Total non renewable primary energy use (MJ)
SM	Secondary material use (kg)
RSF	Renewable secondary fuels (MJ)
NRSF	Non renewable secondary fuels (MJ)
FW	Net use of fresh water (m^3)
Waste Indicators	
HW	Hazardous waste disposed (kg)
NHW	Non hazardous waste disposed (kg)
RW	Radioactive waste disposed (kg)
Output Flow Indicators	
CFR	Components for reuse (kg)
MR	Materials for recycling (kg)
MER	Materials for energy recovery (kg)
EEE	Exported energy – electricity (MJ)
EET	Exported energy – thermal (MJ)
Lifecycle Stages / Modules	
A1	Raw material supply
A2	Transport
A3	Manufacturing
A4	Transport to site
A5	Construction / Installation
C1	Deconstruction / Demolition
C2	Transport to waste processing
C3	Waste processing
C4	Disposal
D	Reuse–recovery–recycling potential

REFERENCES

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EPD International (2021): General Programme Instructions for the International EPD® System. version 5.0.

EPD International (2025): PCR 2019:14 Construction products, version 2.0.1, dated 2025-06-05

STANDARDS

EN 15804:2012 + A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

EN 16485:2014 Round and sawn timber. Environmental product declarations. Product category rules for wood and wood-based products for use in construction

EN 16449:2014 Wood and wood-based products. Calculation of the biogenic carbon content of wood and conversion to carbon dioxide

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

ISO 14025:2010 Environmental labels and declarations. Type III environmental declarations. Principles and procedures.

ISO 14044:2006 Environmental management. Life Cycle Assessment. Requirements and guidelines.

VERSION HISTORY

Original version of the EPD — 2026-05-22

This document represents the original version of the Environmental Product Declaration for hardboard products manufactured by Betanzos HB. No previous versions of this EPD have been published.

EPD
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