

EPD[®] Environmental Product Declaration



ACCORDING TO:

(ISO 14044:2006)
Environmental management.
Life cycle assessment.
Requirements and guidelines (2006).

(ISO 14025:2006)
Environmental labels and declarations.
Type III environmental declarations.
Principles and procedures (2006).

GPI, general programme instructions for the international EPD[®] system V3.01 (2019-09-18).

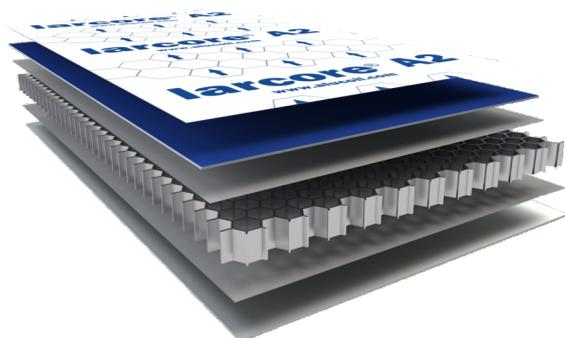
EN 15804:2012+A2:2019
Sustainability of construction works.
Environmental product declarations.
Core rules for the product category of construction products.

PCR 2019: 14
Construction products V1.1 (2024-12-20)

ENVIRONMENTAL PRODUCT DECLARATION

According to ISO 14025 and EN 15804:2012+A2:2019 for:

larcore[®] A2 6 mm 0.7/0.5
larcore[®] A2 14 mm 0.7/0.7
larcore[®] A2 14 mm 1.0/1.0



Programme: The International EPD[®] System
www.environdec.com

Programme operator: EPD International AB

EPD registration number: S-P-02207

Publication date: 2020/10/26

Publication validez: 2025/10/26

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

Aluminium Honeycomb Panels for Architectural Envelopes



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Programme information	
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CEN EN 15804 serves as Product Category Rule (PCR)
Product Category Rules (PCR): Construction products PCR 2019:14 v1.1
The PCR review was conducted by Martin Erlandsson, IVL Swedish Research Institute, martin.erlandsson@ivl.se
Independent third-party verification of the declaration and data, according to ISO 14025:2006: <input type="checkbox"/> EPD certification process <input checked="" type="checkbox"/> EPD verification
Third party verifier: Lorena Pereda Pereda, Fundación Centro Tecnológico de Miranda de Ebro <i>In the case of accredited certification bodies:</i> Accredited by: <i>In the case of recognized individual verifiers:</i> Approved by: The International EPD® System
The procedure for follow-up data during EPD validity involves a third-party verifier: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

The EPD owner has sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Product Group:	LARCORE® A2 , Aluminium honeycomb panels	Date
Owner of the EPD	ALUCOIL, S.A.	05/10/2020
EPD registration number:	S-P-02207	

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1. PRODUCT-RELATED INFORMATION

1.1 INFORMATION ABOUT THE COMPANY

ALUCOIL® is a Spanish multinational company, with headquarters in Miranda de Ebro (Burgos-SPAIN), and part of the Alibérico Group – specialists in the transformation and manufacture of advanced materials for building, transport, and industrial applications. ALUCOIL, with modern factories and commercial offices on four continents (Europe, Africa, America & Oceania), is a high-tech company, innovative and growth-orientated, whose cutting-edge production lines turn out the latest innovative products. ALUCOIL has been since 1996 manufacturing and transforming high-tech aluminium materials for building and construction, with more than 40 years of know-how in the aluminium field.

The A **ALUCOIL®** global product line is spread over five business units:

- Powder Coating of aluminium sheet & coil for protective and decorative applications under the brands of **TERMOLAC®** and **DUROLAC®**.
- Top Quality ACM – aluminium Composite Panels commercialized internationally under the renowned brands **LARSON®** for architectural wall cladding and corporate image design. Metal composite options are also available in Stainless Steel, Copper, Zinc, and Anodized Aluminum.
- **ALMIRR®**: multi-laminate aluminium mirror panels, external grade, for concentrated solar panel arrays, and building architecture accents.
- **LARCORE®**: lightweight aluminium honeycomb panels. Continuous process manufactured, available up to 78.75" wide (2 meters) and in custom lengths, it is ideal as a structural wall panel for buildings, elevators, buses, ferries, RV' s, and high-speed trains.
- **ANOLAC ®**: Corrugated aluminium sheets for roofing, walls, accent coverings, and enclosures for roofing, walls, and enclosures.



Picture 1: Installations of Alucoil, S.A. in Miranda de Ebro. Source: ALUCOIL S.A.

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At Alibérico, we have an international calling, exporting 60% of our production to 45 countries on five continents, with the support of our own sales offices.

The Alibérico Group is an industrial and technological group very diversified in terms of product range, the sectors it serves, and geographic markets where it is present.

Starting in 1987, the Alibérico Group is an industrial and technological leader in the aluminium sector. It has grown through acquisition and creation of new businesses, becoming today a consolidated corporate structure comprising of 35 companies with factories in Spain, Portugal, Belgium, UK and Germany, commercial offices in Spain, France, Italy, Portugal, Germany, Poland, Croatia, and Morocco as well as distributor warehouses throughout Europe and North Africa.

The Group has factories in Spain, Germany, and Portugal, and sales offices in the major European Union countries and is organized in 6 areas of business.

- Coating: Coating and anodizing coils, sheets, aluminium and steel profiles, and accessories.
- Building: Composite and honeycomb panels in all types of metals. Shaped and formed metal.
- Transport: Aluminium Honeycomb Panels, for the construction of trucks, buses, and high-speed trains and ferries.
- Foil: Coating and printing of aluminium foil.
- Packaging: Containers, packaging, and household rolls of plastic and aluminium.
- Distribution: Marketing of semi-transformed aluminium products.



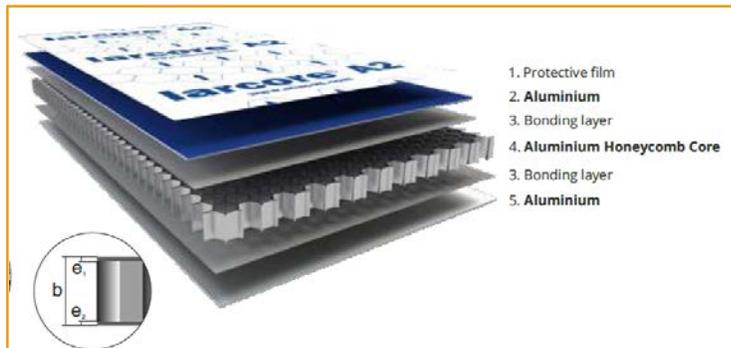
Picture 2: Distribution of plants of the Alibérico Group. Source: ALUCOIL S.A.

Product Group: **LARCORE® A2**, Aluminium honeycomb panels
 Owner of the EPD: ALUCOIL, S.A.
 EPD registration number: S-P-02207

Date
 05/10/2020

1.2 PRODUCT DEFINITION

Scope of validity: This document applies to three **LARCORE® A2** Aluminium Honeycomb panels of total thicknesses: 6, 14, and 14 mm and skin thicknesses: 0.7/0.5, 0.7/0.7, and 1.0/1.0, respectively (the last product not yet on the market). The three panels cover a standard width of 1 000, 1 250, 1500.2000 mm, and with a minimum length of 2 000 and a maximum of 14000 mm. They are manufactured by Alucoil, S.A. in its plant in Miranda de Ebro (Burgos), data from all products have been used to create the environmental product declaration. UN CPC code:4219, 4299.



Picture 3: **LARCORE® A2** Aluminium Honeycomb Panel. Source: ALUCOIL, S.A.

Picture 3 shows the product concept under study. The understudy process flow diagram is displayed in Figure 1. This EPD is intended to be used in a Business to Business (B2B) communication. This EPD is specific to each of the defined products and is not based on average data.

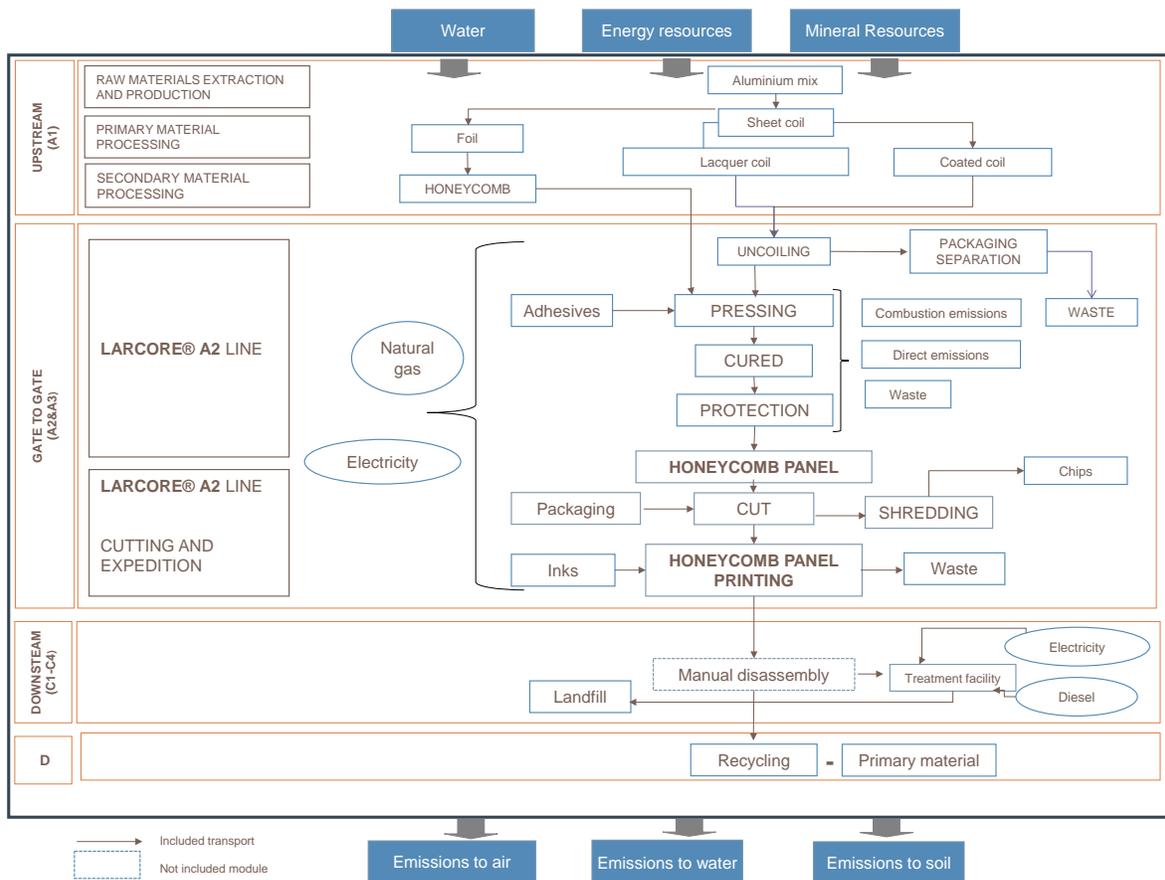


Figure 1: System boundaries of the products **LARCORE® A2**. Source: ALUCOIL, S.A.

Product Group:	LARCORE® A2 , Aluminium honeycomb panels	Date
Owner of the EPD	ALUCOIL, S.A.	05/10/2020
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Product definition **LARCORE® A2** is a new generation of advanced materials, based on aluminum honeycomb technology.

LARCORE® A2 is an aluminum honeycomb panel. Its exhaustive advanced R&D process allows for ideal applicability for projects with large modulations and limited support. It also offers 2 installation systems: Hidetech light for 6mm total thickness panels and Hidetech Pro for 14mm total thickness panels.

Application It is a cladding panel, ideal for architectural projects that value rigidity, lightness, low calorific value, non-toxicity, recyclability, natural ventilation type, and energy efficiency.

LARCORE® A2 is used as a suspended ventilated facade cladding.

Product certifications:

EUROPE [EN 13501-1:2007] **A2-s1,d0**
AUSTRALIA [AS/NZS 1530.3-1999]-[AS/NZS 3837-1998]
USA [ASTM E84] - [NFPA285]



CE **larcore® A2** 14mm **HideTech® PLUS** / **ETA 16-0274**
larcore® A2 Metals Zinc 15mm **HideTech® PLUS** / **ETA 16-0287**

larcore® A2 14 mm **HideTech® PRO** - **FIRE CLASS ARCHITECTURAL A2-s1,d0** (EN 13501-1)

Management certifications



Delivery status The panels are presented in different dimensional characteristics indicated in the Product Technical Notebook and on request (dimensions and units). For accounting purposes, a standard shipping dimension of 5 050 mm x 1 500 mm is considered for packaging elements.

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Constructional data

Table 1: Technical characteristics of the **LARCORE® A2** panels

	LARCORE® A2 6 MM 0.7/0.5	LARCORE® A2 14 MM 0.7/0.7	LARCORE® A2 14 MM 1.0/1.0¹
Panel thickness“b”	6± 0.2 [mm]	14± 0.2 [mm]	14± 0.2 [mm]
Aluminium sheet thickness “e1”	0.7 [mm]	0.7 [mm]	1.0 [mm]
Aluminium sheet thickness “e2”	0.5 [mm]	0.7 [mm]	1.0 [mm]
Aluminium Alloy	Series 5000 EN 573-3 Series 3000 EN 573-3	Series 5000 EN 573-3 Series 3000 EN 573-3	Series 5000 EN 573-3 Series 3000 EN 573-3
Panel theoretical weight	4.19 [kg/m ²]	5.17 [kg/m ²]	6.75 [kg/m ²]
Moment of inertia (*) “I”	0.40 [cm ⁴ /m] DIN 53293	7.13 [cm ⁴ /m] DIN 53293	9.74[cm ⁴ /m] DIN 53293
Rigidity (*) “EI”	2 825 [kNcm ² /m] DIN 53293	49 915 [kNcm ² /m] DIN 53293	68 198[kNcm ² /m] DIN 53293
Section modulus (*) “W”	1.19 [cm ³ /m] DIN 53293	10.19 [cm ³ /m] DIN 53293	13.92 [cm ³ /m] DIN 53293
Sound reduction “RW”	18.85 [dB] ISO 717-1	21 [dB] ISO 717-1	21.66 [dB] ISO 717-1
Acoustic insulation “RA”	19.54 [dBA] ISO 10140-2	21 [dBA] ISO 10140-2	21.56 [dBA] ISO 10140-2
Thermal resistance “R”	0.0067 [m ² K/W]	0.008 [m ² K/W]	0.0086 [m ² K/W]
Standard width	1 000 ⁺² / ₀ / 1 250 ⁺² / ₀ / 1 500 ⁺² / ₀ / 2 000 ⁺² / ₀ [mm]	1 000 ⁺² / ₀ / 1 250 ⁺² / ₀ / 1 500 ⁺² / ₀ / 2 000 ⁺² / ₀ [mm]	1 000 ⁺² / ₀ / 1 250 ⁺² / ₀ / 1 500 ⁺² / ₀ / 2 000 ⁺² / ₀ [mm]
Min./max. length	2 000 ⁺⁶ / ₀ — 14 000 ⁺⁶ / ₀ [mm]	2 000 ⁺⁶ / ₀ — 14 000 ⁺⁶ / ₀ [mm]	2 000 ⁺⁶ / ₀ — 14 000 ⁺⁶ / ₀ [mm]
Cell size “c”	1/4"/6.35 mm	1/4"/6.35 mm	1/4"/6.35 mm
Foil thickness	50 [µ]	50 [µ]	50 [µ]

(*) Value measured in the transversal axis

CORE CHARACTERISTICS

Aluminium alloy	Series 5000 EN 573-3 Series 3000 EN 573-3	Series 5000 EN 573-3 Series 3000 EN 573-3	Series 5000 EN 573-3 Series 3000 EN 573-3
Compression resistance	2.2 [MPa]	2.2 [MPa]	2.2 [MPa]
Core density	56 [kg/m ³]	56 [kg/m ³]	56 [MPa]
Protective primer	ok	ok	ok

FINISHES

Coated surface	PURPA, PE, HQPE, FEVE, and PVDF finishes in two, three, and four layers (depending on finish and colour)
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¹This product does not yet exist on the market.

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1.3 DECLARED UNIT

Declared Unit 1 square meter (1m²) of honeycomb panel element of thickness 6 mm (0.7/0.5), 14 mm (0.7/0.7), and 14 mm (1.0/1.0), covering the following widths: 1 000/1 250/1 500/2000 mm and lengths from 2 000 to 14000 mm. The conversion factors to the weight of the panel are 4.19, 5.17, and 6.75 kg/m², respectively.

Reference lifetime The estimated lifetime of the panels is 50 years, for its expected use in the building.

1.4 CHEMICAL MATERIALS AND SUBSTANCE CONTENT

Table 2: Content information of the **LARCORE® A2** 6 mm 0.7/0.5 panel. Source: ALUCOIL, S.A.

CONTENT OF CHEMICAL MATERIALS AND SUBSTANCES				LARCORE®A2 6 MM 0.7/0.5		
ALL MATERIALS /COMPONENTS	SUBSTANCES	Kg/m ²	%	ENVIRONMENTAL CLASISIFATION	HEALTH CLASSIFICATION	BIOGENIC CARBON Content (kg C)
Film protection	PE & natural rubber	0.093	2	no	no	0
Face ext (metal)	Lacquer Aluminium	1.91	48	no	no	0
Face int (metal)	Primer Aluminium	1.37	34	no	no	0
Honeycomb	Aluminium Foil	0.269	7	no	no	0
Adhesive	Adhesive	0.380	9	no	no	0
THEORETICAL TOTAL		4.02	100			
PACKAGING MATERIALS	SUBSTANCES	Kg/m ²	% ²	ENVIRONMENTAL CLASSIFICATION	HEALTH CLASSIFICATION	BIOGENIC CARBON Content (kg C)
Board	Wood	1.14	27	no	no	0.509
Corners	Cardboard	2.7E-03	0	no	no	0.00109
	Packaging plastic	1.5E-05	0	no	no	
Sheet	Expanded polystyrene	3.4E-02	1	no	no	
	Retractable film	2.9E-06	0	no	no	
Reused	Composite canton box	0.286	7	no	no	
THEORETICAL TOTAL		1.46	35			0.510

² Weight-% (versus the product)

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Table 3: Content information of the **LARCORE® A2** 14 mm 0.7/0.7 panel. Source: ALUCOIL, S.A.

CONTENT OF CHEMICAL MATERIALS AND SUBSTANCES				LARCORE®A2 14 MM 0.7/0.7		
ALL MATERIALS /COMPONENTS	SUBSTANCES	Kg/m ²	%	ENVIRONMENTAL CLASISIFATION	HEALTH CLASSIFICATION	BIOGENIC CARBON Content (kg C)
Film protection	PE & natural rubber	0.093	2	no	no	0
Face ext (metal)	Lacquer Aluminium	1.91	38	no	no	0
Face int (metal)	Primer Aluminium	1.91	38	no	no	0
Honeycomb	Aluminium Foil	0.706	14	no	no	0
Adhesive	Adhesive	0.380	8	no	no	0
THEORETICAL TOTAL		4.02	100			
PACKAGING MATERIALS	SUBSTANCES	Kg/m ²	% ³	ENVIRONMENTAL CLASSIFICATION	HEALTH CLASSIFICATION	BIOGENIC CARBON Content (kg C)
Board	Wood	1.14	22	no	no	0.509
Corners	Cardboard	2.7E-03	0	no	no	0.00109
	Packaging plastic	1.5E-05	0	no	no	
Sheet	Expanded polystyrene	3.4E-02	1	no	no	
	Retractable film	2.9E-06	0	no	no	
Reused	Composite canton box	0.286	6	no	no	
THEORETICAL TOTAL		1.46	29			0.510

³ Weight-% (versus the product)

Product Group:	LARCORE® A2 , Aluminium honeycomb panels	Date
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Table 4: Content information of the LARCORE® A2 14 mm 1.0/1.0 panel. Source: ALUCOIL, S.A.

CONTENT OF CHEMICAL MATERIALS AND SUBSTANCES				LARCORE®A2 14 MM 1.0/1.0		
ALL MATERIALS /COMPONENTS	SUBSTANCES	Kg/m ²	%	ENVIRONMENTAL CLASISIFATION	HEALTH CLASSIFICATION	BIOGENIC CARBON Content (kg C)
Film protection	PE & natural rubber	0.093	2	no	no	0
Face ext (metal)	Lacquer Aluminium	1.91	38	no	no	0
Face int (metal)	Primer Aluminium	1.91	38	no	no	0
Honeycomb	Aluminium Foil	0.706	14	no	no	0
Adhesive	Adhesive	0.380	8	no	no	0
THEORETICAL TOTAL		4.02	100			
PACKAGING MATERIALS	SUBSTANCES	Kg/m ²	%	ENVIRONMENTAL CLASISIFATION	HEALTH CLASSIFICATION	BIOGENIC CARBON Content (kg C)
Board	Wood	1.14	17	no	no	0.509
Corners	Cardboard	2.7E-03	0	no	no	0.00109
	Packaging plastic	1.5E-05	0	no	no	
Sheet	Expanded polystyrene	3.4E-02	2	no	no	
	Retractable film	2.9E-06	0	no	no	
Reused	Composite canton box	0.286	4	no	no	
THEORETICAL TOTAL		1.46	22			0.510

SVHC List **LARCORE® A2** panels do not contain any substance included in the Candidate List of Substances of Very High Concern (SVHC) in concentrations greater than 0.1% by weight.

2. ENVIRONMENTAL PERFORMANCE-RELATED INFORMATION

2.1 RULES FOR DECLARING INFORMATION BY MODULE DERIVED FROM LCA STUDY

This environmental statement is based on information modules and does not cover the aspects of the construction phase (A4-A5), use phase (B1-B7). This EPD is **cradle to gate** type with modules C1-C4 and D and is based on information modules A1- A3, C, and D.

Figure 1 defines the modular scope of the declaration and the processes studied in each module.

Module A1 Upstream stages, from cradle to gate The acquisition, production, and pre-treatment phase of the lacquered coil and epoxy coil and the manufacture of the honeycomb core.

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It includes the energy supply, the packaging, as well as the necessary transports in the distribution chain to the direct Alucoil supplier.

Module A2 The A2 module includes direct transport to the door to the factory and transport to managers, in the case of waste outputs.

Module A3 Gate-to-gate stages, the production phase of **LARCORE® A2** panels. It begins with the entry of its components in the facilities of Alucoil, S.A., and ends when the panels leave these facilities. Module A3 includes auxiliary materials such as adhesives, energy consumption linked to the continuous process of forming/pressing, air emissions, solid waste management, and manufacture of packaging materials.

Modules C1-C4 End-of-life stage of the building, disposal phase of **LARCORE® A2** panels. Non-destructive demolition of the panels, transport to the treatment site and landfill, loading and unloading of the waste at the treatment facility, and treatment of the waste for recycling and final disposal are studied.

Module D Includes the potential for reuse, recovery, and/or recycling expressed as net loads and benefits. This module represents the environmental benefits or loads generated by the panel for being a recyclable product and discounting the content of recycled material in previous life cycles.

Table 5: Modules declared, geographical scope, the share of specific data (in GWP-GHG indicator), and data variation

	PRODUCT STAGE			CONS-CONSTRUCTION		USE STAGE							END OF LIFE STAGE				
	Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction, 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	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU	EU	EU ES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ES, EU	EU, ES	EU, ES	EU, ES	EU
Specific data	25 %	>90 %	>90 %	ND	ND	ND	ND	ND	ND	ND	ND	ND	0 %	0 %	0 %	0 %	0 %
Variation-products	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Variation sites	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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2.2 ENVIRONMENTAL PERFORMANCE DECLARATION –MINIMUM SET OF PARAMETERS FROM THE LCA STUDY

Allocation	The selected physical property has been m2 of panels produced to allocated the flow inputs/outputs) for 6mm and 14mm panels of the rest of the panels. To assign the yield of coils that make up the outer and inner skin of each panel, a theoretical yield based on production (84-96%) was established for each thickness of the coil/panel/face. In this way, the loss of coils due to production losses was considered for each of the skins (outer/interior) of each panel.
Cut –off criteria	There has been no cut-off conducted with the LCA study, 100% of the identified flows are considered. All data collected has been considered, as well as all available emission measurements. The infrastructure linked to the manufacturing processes, in particular machinery and facilities, has not been included.
Data quality	<p>The quality evaluation of the generic and important data has been based on the global environmental guidelines of the UNEnvironment Global Guidance on LCA database development. The quality of data used in LCA and EPD is good.</p> <p>The data has been collected by Alucoil for the production year 2019 (operation and company-specific data).</p> <p>In the manufacture of the honeycomb core (A1), specific data for electrical energy consumption and secondary material content have been used.</p> <p>The sources of secondary data to inventory the materials, surface coatings of the coils, and energy resources used are ecoinvent 3.6 (December 2019). The LCI data for aluminium coil production, aluminium foil production, and aluminium scrap reconditioning are taken from the report published by the European Aluminum Association (EAA, February 2018). The management of packaging and packing waste have been inventoried through the European Life Cycle Database (ELCD) v3.2 (2018).</p>
Electricity	The Spanish electrical mix is applied to the electrical demands of the Alucoil plant, and the plant supplying the aluminium foil The national medium voltage electrical profile included in ecoinvent 3.6 is taken, which describes the Spanish production sources, the imports from Portugal and France, as well as the transmission and distribution of electricity.
Assumptions	<p>The same LCI is used to represent surface treatments for lacquering on the coil (external skin) and treating the surface of the coil (internal skin) of the panels.</p> <p>No specific information is available at the end of the life of the panels. LARCORE® A2 panels due to their mechanical fastening system can be removed by manual operations in a deconstruction process. For this type of product (aluminium products) there is an established recycling infrastructure available worldwide, so that non-destructive disassembly is considered a technically and economically viable option.</p>

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Table 6: End-of-life scenario **LARCORE® A2** panels

PROCESSES	LARCORE® A2 6 mm 0.7/0.5	LARCORE® A2 14 mm 0.7/0.7	LARCORE® A2 14 mm 1.0/1.0	UNIT
Collection process, specific by type	3.56	4.39	5.74	kg collected separately
	0.629	0.776	1.01	kg collected with mixed construction wastes
Recovery system, specified by the type	—	—	—	kg for re-use
	3.98	4.91	6.41	kg for recycling
	—	—	—	kg for energy recovery
Disposal specific by type	0.210	0.259	0.338	kg product or material for final disposal
Scenarios for the development of scenarios (e.g. transport)	0.126	0.155	0.203	tKm, transport from site to installation or pick-up point, 37 % load
	1.05E-02	1.29E-02	1.69E-02	tKm, transport from installation to landfill, 37 % load

Transport

Transports have been included in module A2 of: base materials, pre-products, auxiliary products, packaging and waste, and in module C2 the transports of the waste panel to the treatment plant and the landfill, through the inventory "Transport, freight, lorry 16-32 metric ton, euro5 {RER}} market for transport, freight, lorry 16-32 metric ton, EURO5 | Cut-off, U with a loading factor of 37 %.

The specific transport distance of each supplier/manager is determined through the provincial capital (national transport), country capital (international transport), or country (intercontinental transport).

2.3 POTENTIAL ENVIRONMENTAL IMPACTS-AGGREGATION OF INFORMATION MODULES

Table 7, Table 8, and Table 9 show the potential added impact of cradle-to-gate with the modules C1-C4 and D of the **LARCORE® A2** panels of 6 mm, 14 mm, and 14 mm of the total thickness, and skin thicknesses are presented:0.7/0.5, 0.7/0.7, and 1.0/1.0, respectively.

The potential environmental impacts have been evaluated for the impact categories defined in UNE-EN 15804:2012+A2:2020. The potential environmental impacts have been calculated under the EN 15804 +A2 method included in the SimaPro 9.3.0 software, based on the values of EF 3.0 (published in November 2019). Long-term emissions have been excluded from the calculation.

Product Group: **LARCORE® A2**, Aluminium honeycomb panels
 Owner of the EPD: ALUCOIL, S.A.
 EPD registration number: S-P-02207

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Table 7: Total impact of cradle-to-gate with modules C1-C4 and D panel **LARCORE®A2** 6 mm 0.7/0.5

INDICATOR	UNIT	A1	A2	A3	TOTAL A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO2 eq.	37.3	0.984	4.62	42.9	0	0.0174	9.341E-4	1.97E-3	-25.2
GWP-biogenic	Kg CO2eq.	0.0119	4.04E-4	-2.64	-2.52	0	7.12E-6	3.07E-6	2.34E-6	-0.171
GWP-Luluc	kg CO2 eq.	0.540	7.80E-6	0.00355	0.543	0	1.38E-7	4.00E-6	2.44E-9	-0.459
GWP-total	kg CO2 eq.	37.9	0.985	1.98	40.9	0	0.0174	9.341E-4	1.98E-3	-25.9
ODP	kg CFC 11 eq.	3.26E-6	2.28E-7	3.67E-7	3.85E-6	0	4.03E-9	1.61E-10	4.46E-10	-2.01E-6
AP	mol H+ eq.	0.239	0.00341	0.0239	0.266	0	6.01E-5	9.21E-6	1.05E-5	-0.187
EP-freshwater	kg P eq.	0.00153	5.86E-7	3.52E-4	0.00188	0	1.03E-8	1.96E-8	2.97E-09	0.00111
EP-Marine	kg N eq.	0.0249	0.00109	0.00622	0.0378	0	1.93E-5	2.99E-6	3.97E-6	-0.018
EP-terrestrial	mol N eq.	0.337	0.0120	0.0494	0.399	0	2.12E-4	3.29E-5	4.37E-5	-0.243
POPC	kg NMVOC eq.	0.115	0.0328	0.0183	0.136	0	5.79E-5	8.96E-6	1.21E-5	-0.0811
ADP-minerals&metals*	kg Sb eq.	1.29E-4	5.80E-8	3.92E-6	1.33E-4	0	1.02E-9	3.30E-10	3.04E-10	-4.40E-5
ADP-fossil*	MJ	488	13.9	94.5	596	0	0.246	0.0172	0.0275	-315
WDP	m ³	9.54	-0.0307	4.78	14.3	0	-5.42E-5	3.02E-4	-2.09E-6	-5.87

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; POPC = 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

Product Group:	LARCORE® A2 , Aluminium honeycomb panels	Date
Owner of the EPD	ALUCOIL, S.A.	05/10/2020
EPD registration number:	S-P-02207	

Table 8: Total impact of cradle-to-gate with modules C1-C4 and D panel **LARCORE®A2** 14 mm 0.7/0.7

INDICATOR	UNIT	A1	A2	A3	TOTAL A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO2 eq.	50.0	1.270	4.62	55.9	0	0.01214	1.71E-3	2.44E-3	-31.1
GWP-biogenic	kg CO2 eq.	0.138	5.21E-4	-.64	-2.51	0	8.79E-6	3.99E-6	2.88E-6	-0.211
GWP-Luluc	kg CO2 eq.	0.731	9.41E-6	0.00355	0.735	0	1.70E-7	4.95E-6	3.01E-8	-0.566
GWP-total	kg CO2 eq.	50.9.	1.27	1.99	54.2	0	0.0214	0.00172	2.44E-3	-31.9
ODP	kg CFC 11 eq.	4.37E-6	2.95E-7	3.70E-7	5.04E-6	0	4.97E-9	3.25E-10	5.50E-10	-2.465E-6
AP	mol H+ eq.	0.321	0.00440	0.0240	0.349	0	7.42E-5	1.74E-5	1.29E-5	-0.231
EP-freshwater	kg P eq.	0.00206	7.56E-7	3.52E-4	0.00241	0	1.27E-8	2.46E-8	3.44E-9	-0.00137
EP-Marine	kg N eq.	0.0408	0.00141	0.00625	0.0484	0	2.38E-5	6.39E-6	4.90E-6	-0.0269
EP-terrestrial	mol N eq.	0.452	0.0155	0.0598	0.517	0	2.62E-4	7.02E-5	5.39E-5	-0.0300
POPC	kg NMVOC eq.	0.154	0.00424	0.0183	0.176	0	7.15E-5	1.91E-5	1.49E-5	-0.100
ADP-minerals&metals ⁴	kg Sb eq.	1.71E-4	7.49E-8	3.92E-6	1.75E-4	0	1.26E-9	6.56E-10	3.76E-10	-5.37E-5
ADP-fossil*	MJ	653	18.0	94.7	766	0	0.304	0.0290	0.00340	-389
WDP	m ³	13.1	-0.00396	4.78	17.9	0	-6.68E-5	3.74E-4	-2.58E-6	-7.24

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; POPC = 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

⁴ The results of this environmental impact indicator should be used carefully as the uncertainties of these results are high or experience with the indicator is limited.

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Owner of the EPD	ALUCOIL, S.A.	05/10/2020
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Table 9: Total impact of cradle-to-gate with modules C1-C4 and D panel **LARCORE®A2** 14 mm 1.0/1.0

INDICATOR	UNIT	A1	A2	A3	TOTAL A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO2 eq.	60.4	2.98	4.63	68.1	0	0.0280	1.87E-3	3.18E-3	-40.7
GWP-biogenic	kg CO2 eq.	0.177	6.11E-4	-2.65	-2.47	0	1.15E-5	5.08E-6	3.77E-6	-0.276
GWP-Luluc	kg CO2 eq.	0.881	1.18E-5	0.00355	0.885	0	2.22E-7	6.45E-6	3.93E-8	-0.739
GWP-total	kg CO2 eq.	61.5	1.49	1.99	65.2	0	0.0280	0.00188	3.19E-3	-41.7
ODP	kg CFC 11 eq.	5.28E-6	3.46E-7	3.70E-7	5.99E-06	0	6.49E-9	3.43E-10	7.19E-10	-3.24E-6
AP	mol H+ eq.	0.387	0.00516	0.0240	0.416	0	9.68E-5	1.88E-5	1.69E-5	-0.302
EP-freshwater	kg P eq.	0.00248	8.87E-7	3.52E-04	0.00284	0	1.66E-8	3.18E-8	4.49E-9	-0.00179
EP-Marine	kg N eq.	0.0492	0.00166	0.00625	0.0571	0	3.11E-5	6.59E-6	6.40E-6	-0.0352
EP-terrestrial	mol N eq.	0.545	0.0182	0.0498	0.613	0	3.42E-4	7.25E-5	7.03E-5	-0.391
POPC	kg NMVOC eq.	0.186	0.00497	0.0183	0.209	0	9.33E-5	1.97E-5	1.94E-5	-0.131
ADP-minerals&metals*	kg Sb eq.	2.08E-4	8.79E-8	3.92E-06	2.12E-4	0	1.65E-9	6.95E-10	4.90E-10	-7.01E-5
ADP-fossil*	MJ	787	21.1	94.7	903	0	0.396	0.0328	0.0444	-508
WDP	m³	15.6	-0.00465	4.78	20.4	0	-8.72E-5	4.87E-4	-3.37E-6	-9.45

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; POPC = 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

Product Group:	LARCORE® A2 , Aluminium honeycomb panels	Date
Owner of the EPD	ALUCOIL, S.A.	05/10/2020
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Table 10: Total cradle to gate impact with the C1-C4 and D modules of the **LARCORE® A2** panels under the GWP-GHG indicator (EN 15804:2012+A1:2013)

Indicator	Unit	A1	A2	A3	TOTAL A1-A3	C1	C2	C3	C4	D	
GWP-GHG5	kg CO2 eq	LarcORE®, A2 6 mm 0.7/0.5	36.7	0.977	4.37	42.1	0	0.0172	9.26 E-4	2.93E-4	-24.9
		LarcORE®, A2 14 mm 0.7/0.7	49.3	1.26	4.37	55.0	0	0.0213	1.69E-3	3.62E-4	-30.8
		LarcORE®, A2 14 mm 1.0/1.0	59.7	1.48	4.37	65.6	0	0.0278	0.00185	0.00047	-40.2

2.4 USE OF RESOURCES

Table 11: Parameters describing resource use of expressed per m², **LARCORE® A2** 6 mm 0.7/0.5

LARCORE® A2 6 mm 0.7/0.5										
PARAMETERS	UNIT	A1	A2	A3	TOTAL A1-A3	C1	C2	C3	C4	D
PERE	MJ	136	0.0196	37.5	173	0	3.45E-4	2.44E-3	8.38E-6	-29.9
PERM	MJ	27.8	-4.11E-2	3.55E-1	28.1	0	-7.24E-4	1.71E-4	-1.02E-5	-132.5
PERT	MJ	163	-2.15E-2	37.9	201	0	-3.79E-4	2.61E-3	-1.81E-6	-162
PENRE	MJ	517	15.0	100	632	0	2.64E-1	1.81E-2	4.44E-3	-335
PENRM	MJ	30.4	2.02E-3	0.544	31.0	0	3.57E-5	3.64E-5	1.15E-6	-54.2
PENRT	MJ	547	15.0	100	663	0	2.65E-1	1.81E-2	4.44E-3	-389
SM	kg	1.37	0	0.288	1.66	0	0	0.185	6.49E-2	2.72
RSF	MJ	ND	ND	ND	ND	0	ND	ND	ND	ND
NRSF	MJ	ND	ND	ND	ND	0	ND	ND	ND	ND
FW	m ³	9.16	-3.09E-3	4.19	13.3	0	-5.46E-5	3.03E-4	-2.51E-7	-6.63

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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net freshwater

5 The indicator includes all greenhouse gases included in the total GWP, but excludes removals and emissions of biogenic carbon dioxide and biogenic carbon stored in the product. Therefore, this indicator is equal to the GWP indicator originally defined in EN 15804:2012 + A1:2013.

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Table 12: Parameters describing resource use of expressed per m², **LARCORE® A2** 14 mm 0.7/0.7

LARCORE® A2 14 mm 0.7/0.7

PARAMETERS	UNIT	TOTAL								
		A1	A2	A3	A1-A3	C1	C2	C3	C4	D
PERE	MJ	184	0.0252	37.5	221	0	4.26E-4	3.02E-3	1.03E-05	-36.9
PERM	MJ	38.7	-5.30E-2	3.55E-1	39.0	0	-8.94E-4	2.05E-4	-1.26E-05	-163.5
PERT	MJ	222	-2.77E-2	37.9	260	0	-4.68E-4	3.22E-3	-2.23E-06	-200
PENRE	MJ	693	19.3	100	812	0	3.26E-1	3.06E-2	5.48E-03	-441
PENRM	MJ	41.1	2.61E-3	0.544	41.7	0	4.40E-5	4.86E-5	1.42E-06	-66.9
PENRT	MJ	734	19.4	100	854	0	0.326	3.07E-2	5.48E-03	-480
SM	kg	2.00	ND	0.288	2.29	0	ND	0.160	18.01E-02	3.36
RSF	MJ	ND	ND	ND	ND	0	ND	ND	ND	ND
NRSF	MJ	ND	ND	ND	ND	0	ND	ND	ND	ND
FW	m ³	12.4	-3.99E-3	4.19	16.6	0	-6.73E-5	3.76E-4	-3.09E-07	-8.18

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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net freshwater

Table 13: Parameters describing resource use of expressed per m², **LARCORE® A2** 14 mm 1.0/1.0

LARCORE® A2 14 mm 1.0/1.0

PARAMETERS	UNIT	TOTAL								
		A1	A2	A3	A1-A3	C1	C2	C3	C4	D
PERE	MJ	221	0.0296	37.5	259	0	5.56E-04	3.93E-03	1.35E-05	-182
PERM	MJ	46.3	-6.22E-02	3.55E-01	46.6	0	-1.17E-03	2.72E-04	-1.64E-05	-47.4
PERT	MJ	268	-3.26E-02	37.9	305	0	-6.11E-04	4.20E-03	-2.91E-06	-229
PENRE	MJ	837	22.7	100	960	0	4.26E-01	3.46E-02	7.16E-03	-540
PENRM	MJ	49.9	3.06E-03	0.544	50.4	0	5.75E-05	6.11E-05	1.86E-06	-41.5
PENRT	MJ	887	22.7	100	1010	0	4.26E-01	3.47E-02	7.16E-03	-582
SM	kg	2.00	ND	0.288	2.29	0	ND	0.160	1.20E-02	3.36
RSF	MJ	ND	ND	ND	ND	0	ND	ND	ND	ND
NRSF	MJ	ND	ND	ND	ND	0	ND	ND	ND	ND
FW	m ³	14.9	-4.69E-03	4.19	19.0	0	-8.79E-5	4.89E-04	-4.05E-07	-10.7

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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net freshwater

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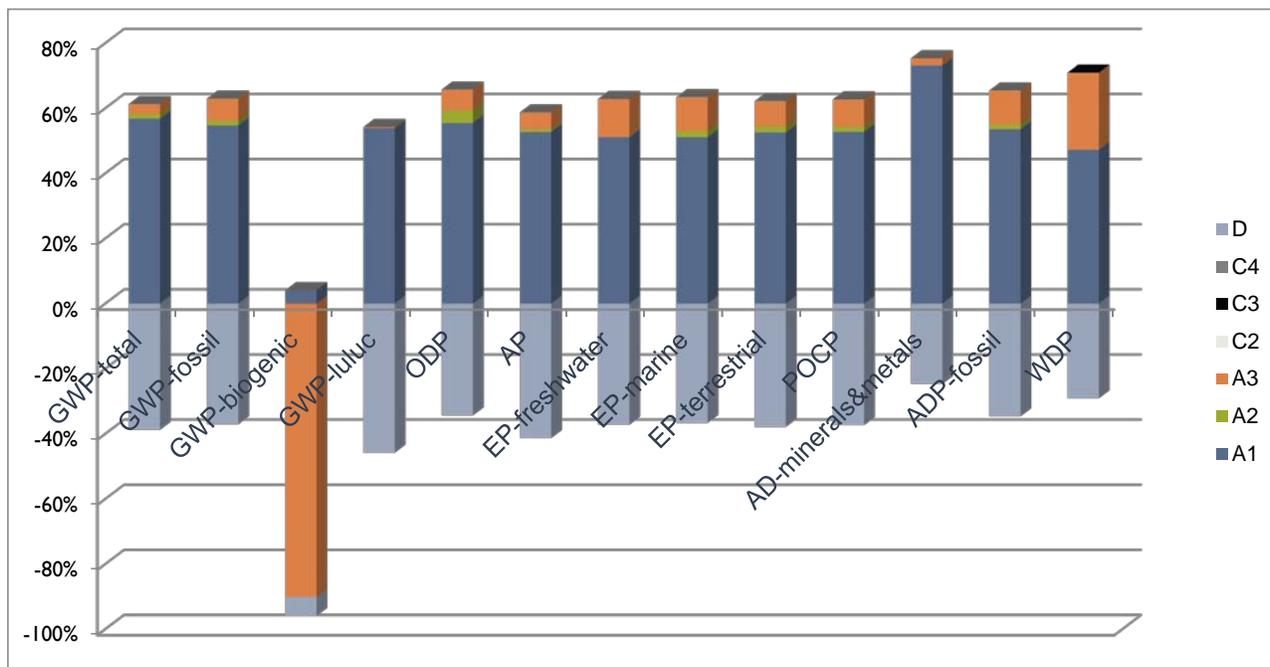
Date
 05/10/2020

Table 14: Other environmental information describing waste categories per m²⁶

WASTE CATEGORIES	UNIT	A1	A2	A3	TOTAL A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	0	0	0	0	0	0	0	0	0
Non-hazardous waste disposed	kg	0	0	0	0	0	0	0	0	0
Radioactive waste disposed	kg	0	0	0	0	0	0	0	0	0
OUTPUT FLOWS										
Components for re-use	kg	0	0	0	0	0	0	0	0	0
Materials for recycling	kg	0	0	0	0	0	0	0	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0
Exported energy	MJ	0	0	0	0	0	0	0	0	0

3. ADDITIONAL INFORMATION

Figure 2: Environmental profile of the LARCORE® A2 panel 6 mm 0.7/0.5



⁶Waste treatment processes are included in the system under study

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Figure 3: Environmental profile of the **LARCORE® A2** panel 14 mm 0.7/0.7

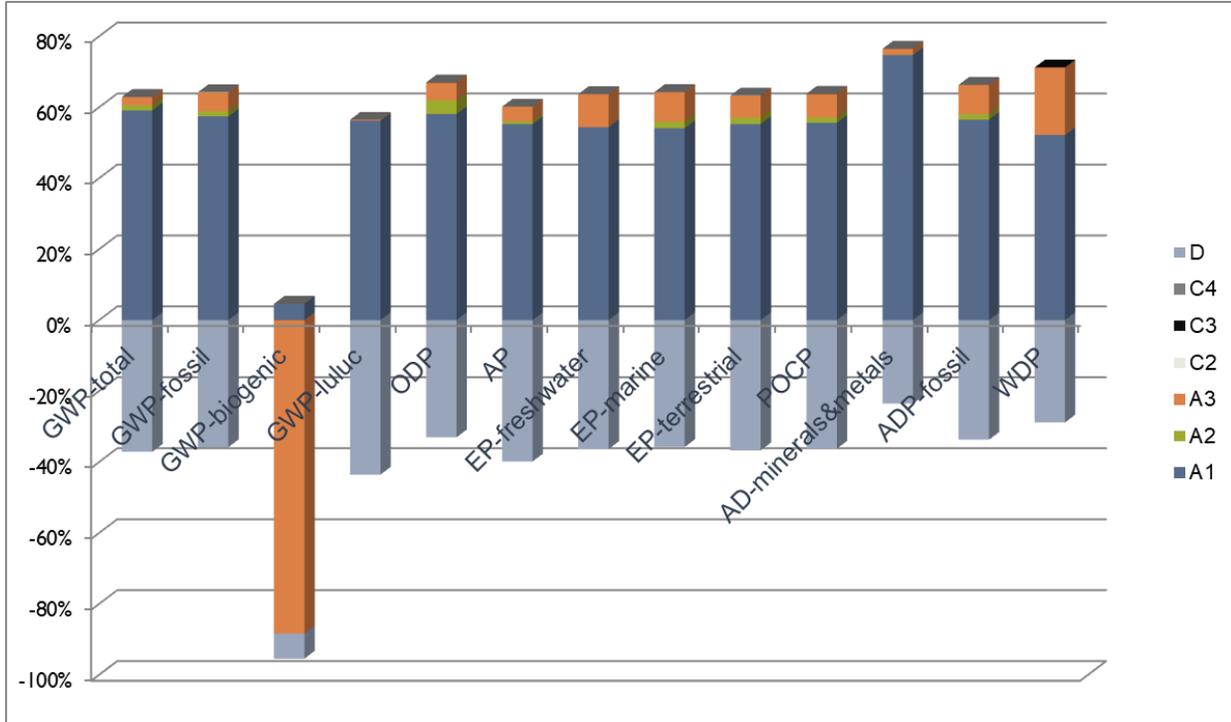
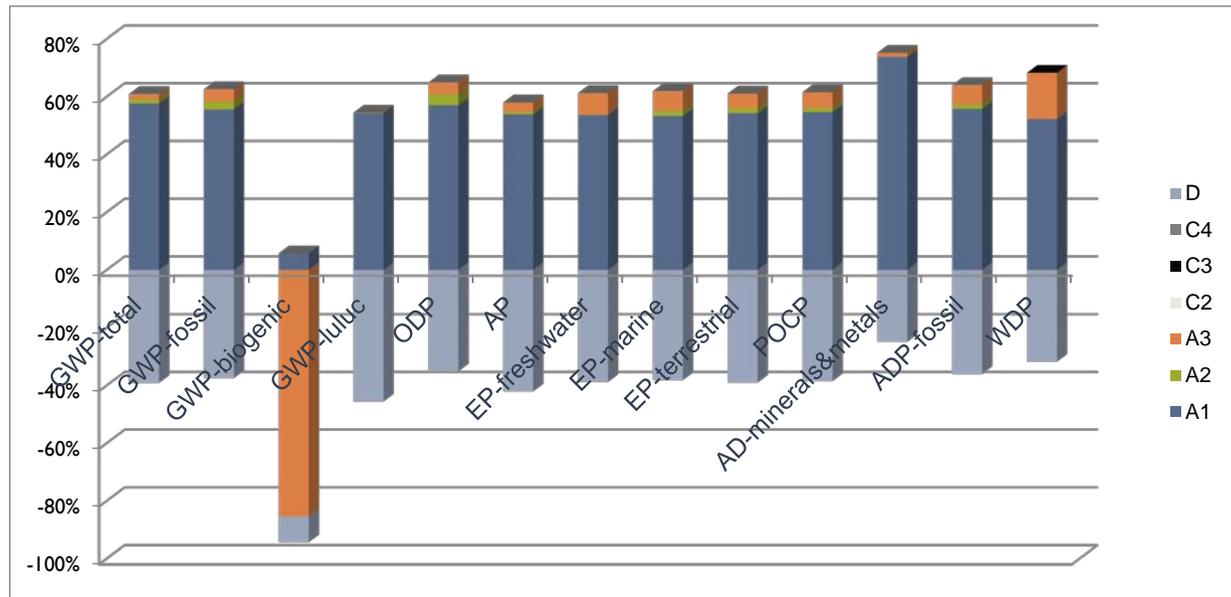


Figure 4: Environmental profile of the **LARCORE® A2** panel 14 mm 1.0/1.0



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The environmental profile of the three panels is similar (see Figure 2, Figure 3, and Figure 4). The relevant data, with the greatest contribution (>80%) of the total impacts, correspond to generic data representing the aluminium coils that form the external and internal skin of the panels.

Within the manufacturing process of aluminium coils, the data with the highest contribution corresponds to primary aluminium, and to a lesser extent to surface coating.

The processes of transport and treatment of residues hardly present any contribution to all environmental indicators.

4. REFERENCES

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