

# Environmental Product Declaration



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

## BuildBond FR

from

**Alubuild, Lda**



Programme:	The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a>
Programme operator:	EPD International AB
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*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](http://www.environdec.com)*



## General information

### Programme information

<b>Programme:</b>	The International EPD® System
<b>Address:</b>	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
<b>Website:</b>	<a href="http://www.environdec.com">www.environdec.com</a>
<b>E-mail:</b>	<a href="mailto:info@environdec.com">info@environdec.com</a>

<b>Accountabilities for PCR, LCA and independent, third-party verification</b>
<b>Product Category Rules (PCR)</b>
CEN standard EN 15804:2012+A2:2019 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 Construction products (EN 15804:A2), Version 1.3.4
PCR review was conducted by: The Technical Committee of the International EPD System. See <a href="http://www.environdec.com">www.environdec.com</a> for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat <a href="http://www.environdec.com/contact">www.environdec.com/contact</a> .
<b>Life Cycle Assessment (LCA)</b>
LCA accountability: SGS Search Ingenieursbureau B.V. <a href="mailto:nl.search.lca@sgs.com">nl.search.lca@sgs.com</a> Meerstraat 2, 5473 AA Heeswijk, The Netherlands
<b>Third-party verification</b>
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:  <input checked="" type="checkbox"/> EPD verification by individual verifier  Third-party verifier: Dandan Li, Star Talers EnviroTech Ltd. - <a href="mailto:dandan.li@startalers.cn">dandan.li@startalers.cn</a>  Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier:  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  [Procedure for follow-up the validity of the EPD is at minimum required once a year with the aim of confirming whether the information in the EPD remains valid or if the EPD needs to be updated during its validity period. The follow-up can be organized entirely by the EPD owner or together with the original verifier via an agreement between the two parties. In both approaches, the EPD owner is responsible for the procedure being carried out. If a change that requires an update is identified, the EPD shall be re-verified by a verifier]

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

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the

same PCR (including the same 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 equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

## Company information

Owner of the EPD: Alubuild, Lda  
Contact: Isabel Carvalho  
[Isabel.carvalho@alubuild.com](mailto:Isabel.carvalho@alubuild.com)  
<https://alubuild.com/>

### Description of the organisation:

Based in Vila Verde, Braga, Alubuild produces a final product, Buildbond®, that meets the different demands of the market.

Buildbond® panels guarantee flatness, different thicknesses, textures, coatings and colours, as well as high resistance to corrosion.

Alubuild is the first Portuguese company to produce aluminium composite panels. It also has a machining and processing service centre, as well as a modern laboratory equipped with the latest technology, allowing for greater quality control. In this way, Alubuild is prepared to respond to various sectors, including architecture, corporate identity, signage, and transport.

### Product-related or management system-related certifications:

Alubuild holds the following certifications at the time of publication:

ISO 9001:2015 issued by SGS, Lisboa, Portugal

ISO 14001:2015 issued by SGS, Lisboa, Portugal

DITplus 684p-24 issued by Instituto de Ciencias de La Construcción Eduardo Torroja, Madrid, Spain

ETE 21/1110 issued by Instituto de Ciencias de La Construcción Eduardo Torroja, Madrid, Spain

ITB-KOT-2023-2378-wydanie 2 issued by Instytut Techniki Budowlanej, Warszawa, Poland

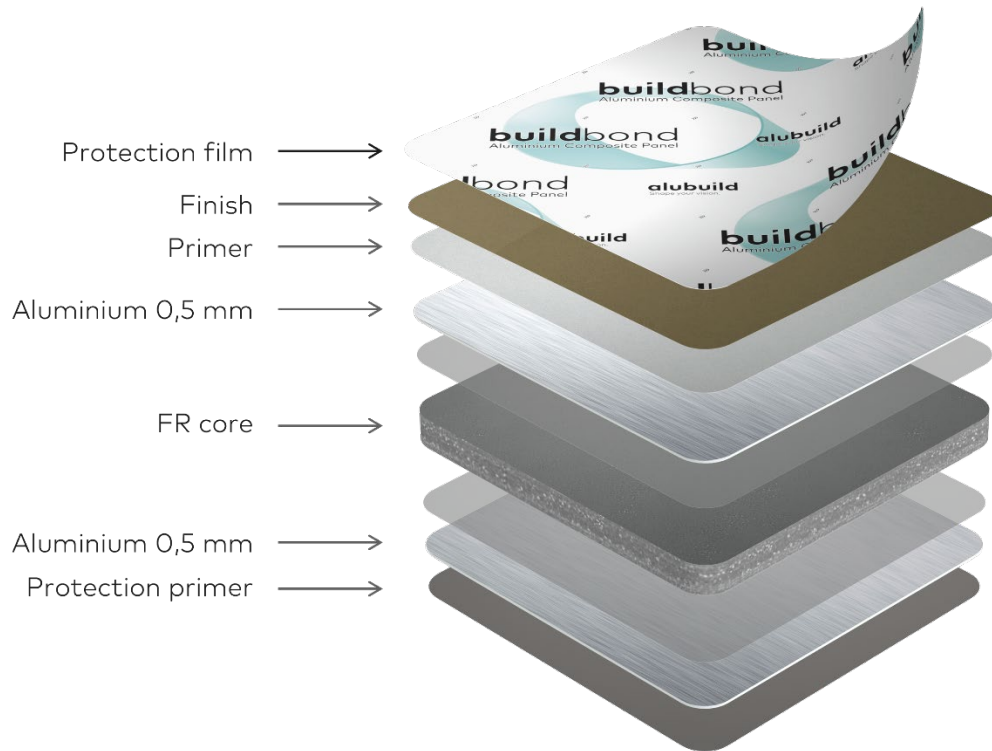
Name and location of production site(s): Parque Industrial de Gême, 4730-180 Vila Verde – Portugal

## Product information

Product name: BuildBond FR  
Product identification: Composite façade panels  
Product description:

Buildbond FR is an aluminium composite panel made up of two aluminium sheets and a fire-retardant polymer and mineral core. It is made for situations where it is necessary to ensure that there is no flame propagation in contact with fire (fire class B-s1, d0). The composite panels are applied to facades and offer high durability, flexibility, and resistance to corrosion and UV rays.

The panels can be produced in varying dimensions up to a maximum width of 2 metres. Composite panels have low weight (7,5 kg/m<sup>2</sup>), flatness (4 mm), impact resistance, bending capacity and are easy to mould into various shapes. BuildBond panels can have paint finishes ranging from PVDF, PU, PE and HDPE, depending on their application.



Our Buildbond FR panel has the following technical characteristics:

Width (min / max)	mm	1000-2000
Length (min / max)	mm	2000-6000
Peeling	N/mm	≥ 7,0
Flexural Strength	MPa	≥ 100
Elastic modulus	MPa	≥ 22000

UN CPC code: 314 – Boards and panels  
Geographical scope: A1-A2: PT, ES, IT  
 A3: PT  
 A4: GLO  
 A5: GLO  
 B1-B7: GLO  
 C1-C4: RER  
 D: RER

## LCA information

Declared unit: 1 m<sup>2</sup>

Reference service life:

25 years

Time representativeness:

Data was gathered over production year 2023

Database(s):

Ecoinvent 3.9.1

LCA software used:

SimaPro 9.5

Applied characterization method:

EN 15804 + A2 (adapted) based on EF3.1

Description of system boundaries:

Cradle to grave and module D (A + B + C + D)

Cut-off criteria:

All relevant and known processes and materials have been included. The following processes are not included in this study because the contribution to the different environmental effects are expected to be lower than 1%:

- Maintenance and the use of auxiliary materials and equipment, with exception of such processes that are included in the Ecoinvent background processes.
- Capital goods and infrastructure processes, with exception of such processes that are included in the Ecoinvent background processes.

## A1-A3 Product stage

The product stage is made up of the stages of production of semi-finished products (A1), transport of semi-finished products (A2) and the production (A3).

### A1 – Production of semi-finished products

This module takes into account the semi-finished products (e.g. aluminium, mineral core ingredients) needed to make BuildBond FR.

### A2 – Semi-finished products transport

This module includes the transport of the semi-finished products from Spain, Italy and Portugal to the production locations of Alubuild in Vila Verde, Portugal. The distance and mode of transport for each semi-finished products has been modelled here.

### A3 – Production

This module consists of the processing and assembly of components to form BuildBond FR. The packaging is also included, for which Alubuild configures their own pallets. Production losses and its waste treatment is accounted for in this module as well. A large share of the production losses are recycled internally.

Electricity consumption is based partially on own PV production capacity (0,0660 kg CO<sub>2</sub>-eq/kWh) and the rest is attributed to electricity from the Portuguese residual grid (0,3792 kg CO<sub>2</sub>-eq/kWh).

## A4-A5 Installation stage

The installation stage consists of modules A4 (distribution) and A5 (installation)

The A4 Distribution module includes transport of the packaged product from Alubuild production location to their clients. The transport distances is a weighted average of distance by ship and truck to clients in Europe and North America.

The A5 installation module includes installation of BuildBond FR panels and the waste treatment of packaging. Installation of the BuildBond FR panels is done manually, without help of large machinery. For waste treatment of packaging, a standard scenario for packaging materials from the Dutch

Assessment method was assumed. These scenarios were deemed to be sufficiently representative for a European setting.

**B1-B7 Use stage**

The use stage is split into the modules: use, maintenance, reparation, replacement, rehabilitation, operational energy use and operational waste use.

The BuildBond panels require no specific maintenance, replacement or rehabilitation during their use. Incidental damage is not taken into account according to EN15804+A2.

**C1-C4 End of life stage**

The C1-C4 modules describe the demolition and waste treatment of the product.

**C1 - Demolition**

Similar to A5, demolition is considered to be done manually and not require any large machinery.

**C2 – Transport to waste manager**

The end-of-life product is transport by truck to the waste processing location. The transport distance is assumed to be 200km, 250km or 300km from respectively recycling facility, landfill location, or municipal waste incineration.

**C3 – Waste treatment**

The waste scenarios are taken from the Dutch Assessment method and assumed to be representative for a European setting given the high value of aluminium, and difficulty of recycling the mineral core. The table below shows an overview of the waste treatment scenarios.

Material	Recycling	Incineration	Landfill
Mineral core incl. adhesive	0%	80%	20%
Aluminium	94%	3%	3%

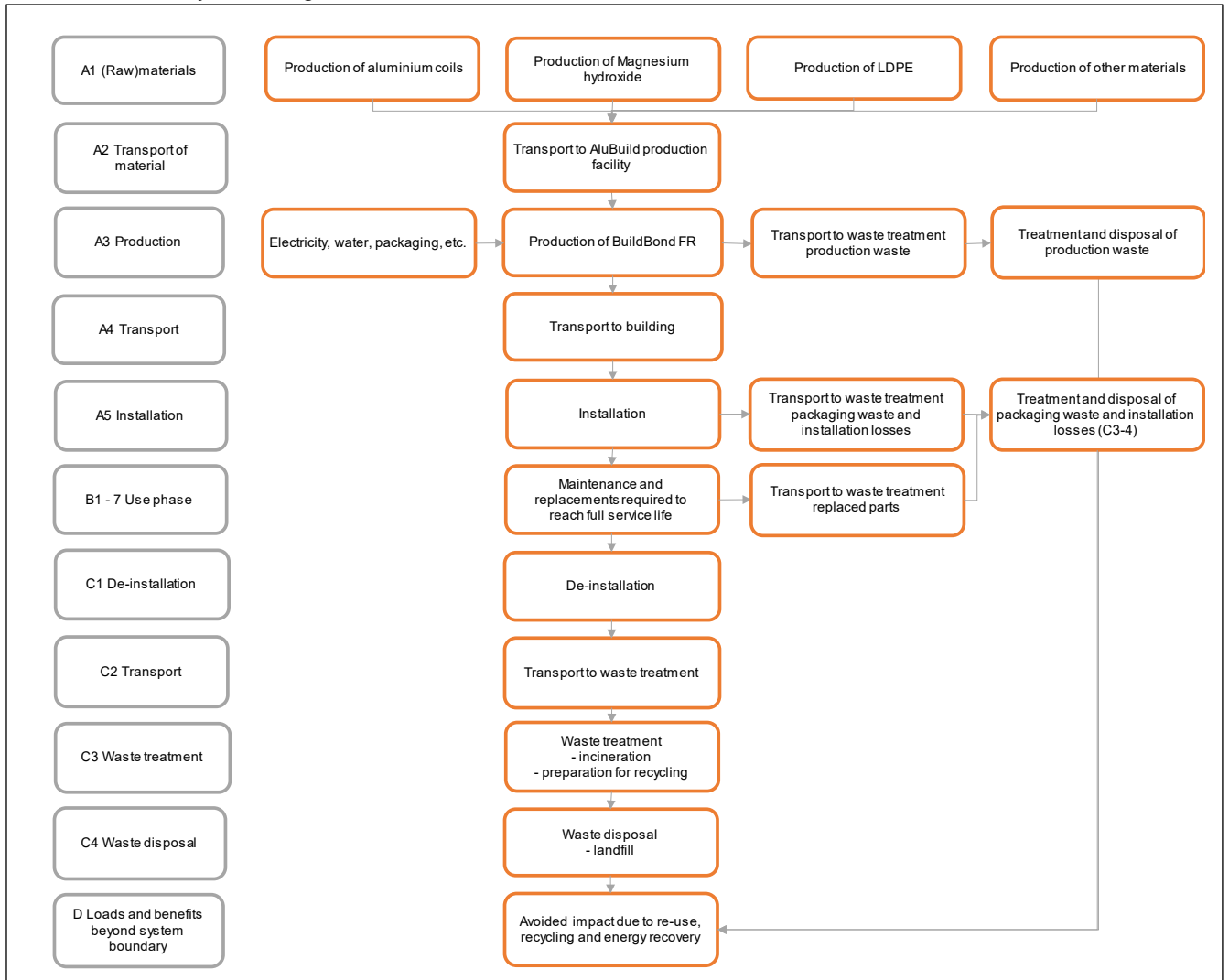
**C4 – Landfill**

The remaining percentage of the product that cannot be recycled or is not incinerated is assumed to go to landfill.

**D Loads and benefits beyond the system boundary**

The loads and benefits due to recycling and incineration are included in this module. For energy recovery from incinerated waste, energy recovery efficiencies from the CEWEP Energy Report III (December 2012) are used. Benefits from packaging recycling and incineration is included in this

module as well. System diagram:



More information: [www.alubuild.com](http://www.alubuild.com)



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

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage	
	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	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	RER	RER	PT	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	RER	RER	RER	RER	GLO	
Specific data used	9,0%					-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%					-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%					-	-	-	-	-	-	-	-	-	-	-	-	-

## Content information

<b>Product components</b>	<b>Weight, kg</b>	<b>Post-consumer material, weight-%</b>	<b>Biogenic material, weight-% and kg C/kg</b>
Mineral core	6,06	0%	0
Aluminium	1,29	50%	0
Adhesive	0,13	0%	0
TOTAL	7,48	8,62%	0
<b>Packaging materials</b>	<b>Weight, kg</b>	<b>Weight-% (versus the product)</b>	<b>Weight biogenic carbon, kg C/kg</b>
Pallets, wood	0,146	1,95%	0,425
Cardboard	0,059	0,79%	0,416
Other	0,0023	0,03%	0
TOTAL	0,207	2,77%	0,414

The product does not contain in its life cycle any dangerous substances including in the “Very High Impact Candidate List for Authorization (SVHC)” in a percentage greater than 0.1% of the weight of the product.

## Results of the environmental performance indicators

### Mandatory impact category indicators according to EN 15804

Results per declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO <sub>2</sub> eq.	1,90 E+01	9,59 E-01	3,75 E-03	0	0	0	0	0	0	0	0	3,06 E-01	4,47 E+00	9,87 E-02	- 1,56 E+00
GWP-biogenic	kg CO <sub>2</sub> eq.	- 2,96 E-01	0,00 E+00	2,96 E-01	0	0	0	0	0	0	0	0	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
GWP-luluc	kg CO <sub>2</sub> eq.	2,52 E-02	4,70 E-04	9,69 E-08	0	0	0	0	0	0	0	0	1,49 E-04	5,97 E-05	4,17 E-05	- 2,37 E-02
GWP-total	kg CO <sub>2</sub> eq.	1,88 E+01	9,60 E-01	3,00 E-01	0	0	0	0	0	0	0	0	3,06 E-01	4,47 E+00	9,87 E-02	- 1,59 E+00
ODP	kg CFC 11 eq.	2,85 E-07	2,10 E-08	1,81 E-11	0	0	0	0	0	0	0	0	6,70 E-09	1,82 E-09	1,30 E-09	- 4,79 E-08
AP	mol H <sup>+</sup> eq.	8,50 E-02	4,60 E-03	3,78 E-06	0	0	0	0	0	0	0	0	1,43 E-03	9,53 E-04	4,00 E-04	- 1,89 E-02
EP-freshwater	kg P eq.	4,34 E-04	7,86 E-06	4,21 E-09	0	0	0	0	0	0	0	0	2,51 E-06	2,04 E-06	8,42 E-07	- 7,56 E-05
EP-marine	kg N eq.	1,56 E-02	1,79 E-03	1,79 E-06	0	0	0	0	0	0	0	0	5,62 E-04	3,67 E-04	1,59 E-04	- 2,53 E-03
EP-terrestrial	mol N eq.	1,74 E-01	1,93 E-02	1,79 E-05	0	0	0	0	0	0	0	0	6,06 E-03	4,01 E-03	1,59 E-03	- 2,97 E-02
POCP	kg NMVOC eq.	5,94 E-02	6,72 E-03	4,55 E-06	0	0	0	0	0	0	0	0	2,12 E-03	1,04 E-03	5,48 E-04	- 1,97 E-03
ADP-minerals&metals*	kg Sb eq.	1,45 E-04	2,98 E-06	6,63 E-10	0	0	0	0	0	0	0	0	9,52 E-07	2,03 E-06	1,15 E-07	1,14 E-05
ADP-fossil*	MJ	1,78 E+02	1,38 E+01	2,71 E-03	0	0	0	0	0	0	0	0	4,41 E+00	8,68 E-01	1,21 E+00	7,29 E+01
WDP*	m <sup>3</sup>	2,76 E+00	6,01 E-02	7,17 E-05	0	0	0	0	0	0	0	0	1,92 E-02	2,21 E-02	5,08 E-02	3,02 E+00
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															

\* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

### Additional mandatory and voluntary impact category indicators

Results per declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG <sup>1</sup>	kg CO <sub>2</sub> eq.	1,91 E+01	9,60 E-01	3,75 E-03	0	0	0	0	0	0	0	0	3,06 E-01	4,47 E+00	9,87 E-02	- 1,59 E+00
PM	Disease inc.	2,22 E-06	9,38 E-08	2,88 E-11	0	0	0	0	0	0	0	0	3,00 E-08	7,66 E-09	8,51 E-09	- 2,16 E-07
IRP	kBq U-235 eq	2,51 E-01	7,14 E-03	3,09 E-06	0	0	0	0	0	0	0	0	2,28 E-03	1,34 E-03	6,54 E-04	9,74 E-02
ETP-fw	CTUe	1,67 E+02	6,81 E+00	2,45 E-02	0	0	0	0	0	0	0	0	2,17 E+00	1,68 E+00	8,78 E-01	- 8,42 E+00
HTP-c	CTUh	3,22 E-08	5,16 E-10	8,64 E-13	0	0	0	0	0	0	0	0	1,64 E-10	2,17 E-10	3,21 E-11	- 4,89 E-09
HTP-nc	CTUh	5,56 E-07	1,07 E-08	3,86 E-11	0	0	0	0	0	0	0	0	3,42 E-09	9,29 E-09	4,36 E-10	- 5,42 E-08
SQP	Pt	8,43 E+01	1,04 E+01	9,78 E-04	0	0	0	0	0	0	0	0	3,31 E+00	8,90 E-01	2,74 E+00	- 2,57 E+01
Acronyms	PM = Particulate Matter; IRP = Ionizing Radiation Potential; ETP-fw = Eco-Toxicity Potential – fresh water; HTP-c = Human Toxicity Potential, carcinogenic; HTP-nc = Human Toxicity Potential, non-carcinogenic; SQP = Soil Quality Potential															

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

It is discouraged to use the results of A1-A3 without considering the results of module C3.

### Resource use indicators

Results per declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	2,14 E+01	2,18 E-01	2,67 E+00	0	0	0	0	0	0	0	0	6,98 E-02	7,71 E-02	2,20 E-02	- 1,25 E+01
PERM	MJ	2,67 E+00	0,00 E+00	- 2,67 E+00	0	0	0	0	0	0	0	0	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
PERT	MJ	2,40 E+01	2,18 E-01	1,36 E-04	0	0	0	0	0	0	0	0	6,98 E-02	7,71 E-02	2,20 E-02	- 1,25 E+01
PENRE	MJ	1,06 E+02	1,47 E+01	2,93 E-03	0	0	0	0	0	0	0	0	4,69 E+00	6,47 E+01	1,70 E+01	7,82 E+01
PENRM	MJ	7,94 E+01	0,00 E+00	0,00 E+00	0	0	0	0	0	0	0	0	0,00 E+00	- 6,37 E+01	- 1,57 E+01	0,00 E+00
PENRT	MJ	1,85 E+02	1,47 E+01	2,93 E-03	0	0	0	0	0	0	0	0	4,69 E+00	9,32 E-01	1,29 E+00	7,82 E+01
SM	kg	2,76 E+00	0,00 E+00	0,00 E+00	0	0	0	0	0	0	0	0	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00

<sup>1</sup> 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<sub>2</sub> is set to zero.

RSF	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0	0	0	0	0	0	0	0	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
NRSF	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0	0	0	0	0	0	0	0	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
FW	m <sup>3</sup>	9,74 E-02	2,08 E-03	1,43 E-05	0	0	0	0	0	0	0	0	6,64 E-04	9,12 E-04	1,24 E-03	1,70 E-02
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

Results per declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	4,86 E-03	8,71 E-05	3,43 E-08	0	0	0	0	0	0	0	0	2,78 E-05	7,97 E-06	5,97 E-06	- 7,94 E-05
Non-hazardous waste disposed	kg	3,80 E+00	8,71 E-01	6,31 E-04	0	0	0	0	0	0	0	0	2,79 E-01	5,70 E-02	4,72 E+00	- 6,07 E-01
Radioactive waste disposed	kg	1,81 E-04	4,64 E-06	2,04 E-09	0	0	0	0	0	0	0	0	1,48 E-06	1,00 E-06	4,02 E-07	8,13 E-05

## Output flow indicators

Results per declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0	0	3,95 E-03	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	3,87 E-02	0	4,74 E-02	0	0	0	0	0	0	0	0	0	1,24 E+00	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	2,30 E-02	0	0	0	0	0	0	0	0	0	7,57 E+00	0	0
Exported energy, thermal	MJ	0	0	3,99 E-02	0	0	0	0	0	0	0	0	0	1,31 E+01	0	0

## Additional environmental information

Regular cleaning and maintenance are essential to prolong the good condition of Buildbond® panels.

### The importance of atmospheric agents

In an aggressive atmospheric environment, especially near marine areas with high UV LEVELS, industrial areas and areas near sports pools, a change in appearance can occur, such as changes in colour and gloss.

### Maintenance

- Keep Buildbond® panels clean by preventing incompatible materials or large amounts of contamination from coming into contact with the panel surface;
- Remove sheets, dirt and other objects that may cause water to accumulate on the tray;
- Examine and repair local defects that may cause premature deterioration of the coating or corrosion of the substrate.

### Cleaning

- Cleaning can be done with water and a soft brush;
- A pH neutral product can be used ( $5 \geq \text{pH} \leq 8$ ) as long it is carefully removed with water after a few minutes of action;
- In situations where this is not sufficient, you can use a pressure wash, as long as that does not exceed 30 bars;
- The paint washing should be carried out from the top to the bottom of the facade;
- It is mandatory to inspect and clean Buildbond® panels every 6 months to maintain their appearance and durability;
- In areas more susceptible to the accumulation of residues, cleaning should be carried out more frequently, with 4 times a year being advisable.

### Protective film

- Do not write on the protective film, we advise that all relevant information is written on the non-visible side of the panel,
- Do not remove the protective film until the material has been installed on site;
- Once placed on the façade, remove the protective film within a maximum of 30 days, to avoid degradation of the adhesive by the action of UV rays, which would make it difficult to remove the film.

### Working temperature

All transformation works on aluminium composite panels should be carried out with a product temperature above 10°C.

## Information related to Sector EPD

The presented EPD is individual.

## Differences versus previous versions

The presented EPD is the first, there are no previous versions.

## References

General Programme Instructions of the International EPD<sup>®</sup> System. Version 4.0.

PCR 2019:14. Construction products (EN 15804:A2), Version 1.3.4

ISO 14040 Environmental management - Life cycle assessment - Principles and framework (ISO 14040:2006,IDT), July 2006

ISO 14044 Environmental management - Life cycle assessment - Requirements and guidelines (ISO 14044:2006,IDT), July 2006

ISO 14025, Environmental labels and declarations – Type III environmental declarations – Principles and procedures (ISO 14025:2006,IDT), July 2006

EN 15804+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products, November 2019

Confederation of European Waste-to-Energy Plants (CEWEP), Energy Report III, December 2012

