ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Etex Building Performance International
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ETE-20230132-IBA2-EN
Issue date	31.07.2023
Valid to	30.07.2028

WINDPANEL® Standard and WINDPANEL® Premium

Etex Building Performance International

Institut Bauen und Umwelt e.V.

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ECO PLATFORM EPD VERIFIED

1. General Information

Etex Building Performance International

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-ETE-20230132-IBA2-EN

This declaration is based on the product category rules:

Calcium silicate insulating materials, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

31.07.2023

Valid to

30.07.2028

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

WINDPANEL® Standard and WINDPANEL® Premium

Owner of the declaration

Etex Building Performance International
Rue Marcel Demonque 500
84915 Avignon Cedex 9
France

Declared product / declared unit

Production and installation of 1 m2 WINDPANEL® Standard and WINDPANEL® Premium with a thickness of 8 mm

Scope:

This EPD is representative and relevant for WINDPANEL® Standard and WINDPANEL® Premium boards produced by ETEX in Guangzhou (China) and installed in Europe. The data describing the direct inputs and outputs of the foreground processes are representative for ETEX production of the year 2021 in Guangzhou, China.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally

Vito D'Incognito,
(Independent verifier)

2. Product

2.1 Product description/Product definition

WINDPANEL® Standard is an effective calcium silicate sheathing board for ventilated facade constructions. The board is characterized by its low weight and its negligible reaction to humidity and temperature fluctuations, as well as the very low Z-value (i.e. measure for water vapor diffusion resistance). WINDPANEL® Standard is the obvious wind barrier for light constructions of wood, steel and aluminium. Panel joints can be taped with WINDPANEL® Tape, where a windproof construction is achieved. WINDPANEL® Standard appears in beige/off-white color and with straight edges.'

'WINDPANEL® Premium is an effective calcium silicate sheathing board for ventilated facade constructions. The Premium version has an hydrophobic surface. The board is characterized by its low weight and its negligible reaction to moisture and temperature fluctuations, as well as the highly water-repellent surface and easy processing. WINDPANEL® Premium is the obvious wind barrier for light constructions of wood, steel and aluminium. Panel joints can be taped with WINDPANEL® Tape, where a wind and waterproof construction is achieved. WINDPANEL® Premium appears in beige/off-white color and with straight edges.
For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) *Regulation (EU) No. 305/2011 (CPR)* applies. The product needs a declaration of performance taking into consideration EN12467:2013+A2:2018, Fibre cement flat sheets and the CE-marking.

For the application and use the respective national provisions apply.

2.2 Application

WINDPANEL® Standard and WINDPANEL® Premium are used as a sheathing board for all types of light facades and for all building types, acting as an effective wind barrier.

2.3 Technical Data

Constructional data

Name	Value	Unit
Gross density	1208	kg/m^3
Compressive strength EN826	9.3	N/mm^2
Flexural strength transverse EN12467	7.0	N/mm^2
Flexural strength longitudinal EN12467	4.6	N/mm^2
Modulus of elasticity - transverse EN12467	1420	N/mm^2
Modulus of elasticity - longitudinal EN12467	1330	N/mm^2
Thermal conductivity	0.22	W/(mK)

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN 12467:2013+A2:2018*, Fibre cement flat sheets.

2.4 Delivery status

The products have a thickness of 8 mm.
The width is 1200 mm.
The length is 2500 or 3000 mm.

2.5 Base materials/Ancillary materials

The product is mainly composed of Cement, Sand, Slaked lime, Water and Fibres.

2.6 Manufacture

All the raw materials are mixed in water and combined to form a thick slurry. The slurry is formed to a board on a forming drum, cut and stacked for curing. The board is autoclaved under saturated steam pressure and dried. Edges are trimmed and the reverse surface is sanded to the desired thickness. All material which is cut off or sanded away is fully recycled within the process.

2.7 Environment and health during manufacturing

Environmental, occupational health, safety and quality management at the Guangzhou plant are in accordance with the following standards:

- *ISO 14001;2015*
- *ISO 9001;2015*
- *ISO 45001:2018*

2.8 Product processing/Installation

The WINDPANEL® Standard and WINDPANEL® Premium board is cut and machined using conventional woodworking equipment with cement suitable blades. Fixing the boards will require appropriate means, which will depend upon the application and bearing structure. Boards can be installed using staples, screws, anchors or glue. In the EPD steel screws and tape have been assumed.

2.9 Packaging

The products are transported and delivered on a wooden pallet and packed with cartons, steel angles, metal straps and a plastic cover foil.

2.10 Condition of use

No maintenance is required, under normal conditions of use. WINDPANEL® Standard and WINDPANEL® Premium are resistant to the effects of moisture, will not physically deteriorate when used in damp or humid conditions and can withstand temperatures up to 80°C and frequent temperature changes.

2.11 Environment and health during use

Under normal conditions of use, WINDPANEL® Standard and WINDPANEL® Premium do not cause any adverse health effects or release of volatile organic compounds (VOCs) into indoor air. No environmental impact on water, air or soil is expected.

2.12 Reference service life

WINDPANEL® is a rather new product on the market and there is not yet extensive evidence regarding its reference service life. However, based on the knowledge of product experts and tests on 20 year old samples it is expected that upon condition that the product is used in accordance with the recommended installation guidelines, it is feasible to assume that this product lasts for 60 years.

2.13 Extraordinary effects

Fire

Information on the fire performance according to *EN 13501:1*.

Fire protection

Name	Value
Building material class	A1
Burning droplets	/
Smoke gas development	/

Water

All ingredients are firmly bound in the matrix. The boards are

insensitive to moisture and no ingredients which could be hazardous to water are washed out in the event of extraordinary effects by water.

Mechanical destruction
In case of mechanical destruction, no risks are expected to occur in terms of environment and human health.

2.14 Re-use phase
Several possibilities exist for the boards after the end of-life of the application in which they were used. If the boards are removed non-destructively by releasing the screws, the undamaged product can be re-used in accordance with the original purpose. If not contaminated with other building construction materials, the boards also allow being recycled by the manufacturer. For this EPD, both 100 % landfill and 100 % recycling are included.

2.15 Disposal
Within the production process, generated waste is reused within the process. When after end-of-life reusing or recycling the boards as described in the previous paragraph is not practical, the boards can be disposed to a landfill. The waste code in accordance with the *European List of Waste* is 17 09 04.

2.16 Further information

3. LCA: Calculation rules

3.1 Declared Unit
Production and installation of 1 m^2 of WINDPANEL® Standard and WINDPANEL® Premium with a thickness of 8 mm

Declared unit

Name	Value	Unit
Gross density	1078	kg/m^3
Declared unit	8.6	kg

The data provided in the EPD, relate to the data of WINDPANEL® Premium, which is considered to be representative of WINDPANEL® Standard as it represents the 'worst case scenario'

3.2 System boundary
Cradle-to-grave

3.3 Estimates and assumptions

3.4 Cut-off criteria
The following processes are considered below cut-off according to the rules as per the PCR, Part A:

- Transport of packaging of raw materials
- Infrastructure and land use of the factory
- NaCl for waste water treatment used during manufacturing, because of very low amounts
- Environmental impacts caused by the personnel of the production plants are not included in the LCA, e.g. waste from the cafeteria and sanitary installations, accidental pollution caused by human mistakes, or environmental effects caused by commuter traffic. Heating or cooling of the plants in order to ensure a comfortable indoor climate for the personnel for example is also neglected.

3.5 Background data
Ecoinvent 3.8 and Industry 2.0

3.6 Data quality
Company-specific data concern the data about the production of WINDPANEL® Standard and WINDPANEL® Premium. All required data about the production process have been delivered to Enperas by ETEX.

The composed datasets for this project are representative and relevant for produced by ETEX in Guangzhou.

3.7 Period under review
The data collected by ETEX are based on data from the year 2021.

3.8 Geographic Representativeness
Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: China

3.9 Allocation
No co-products are produced.

No secondaryraw materials are used.
At ETEX's plant in Guangzhou, different types of calcium silicate boards are produced.

- For the energy consumption, no specific data per production step or product line was available. The production energy has been allocated to the individual product using the annual production volume of the product's materials (physical relationship, kg).
- Product data were available for the raw materials and production waste, so no allocation was needed for this.
- For the packaging of the final product, the quantities of packaging materials used per pallet were weighted and recalculated per kg of product on the pallet.

3.10 Comparability
Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. *Ecoinvent 3.8 and Industry 2.0* are used as background database.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon
The product contains biogenic carbon in the form of cellulose. Also, biogenic carbon is included in the coverage carton and wooden pallets used as packaging material.

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	0.2	kg C
Biogenic carbon content in accompanying packaging	0.035	kg C

Transport to the building site (A4)
The transport scenario selected for this EPD is based on the average transport distances from the production plant in Guangzhou to the installation sites in Europe based on the sales in the reference year 2021.

For those who would like to calculate the transport impacts for a specific project, CO_2 emissions for truck and container ship transport are provided in the table. For calculating the impacts caused by truck transport one needs to multiply the truck CO_2 emissions by the weight of the transported product in ton and by the distance in km by truck. For ship transport, the ship's CO_2 emissions should be used in the same way. Adding up the impacts calculated for truck and ship transport results in the impacts for the specific transportation scenario considered.

Name	Value	Unit
Litres of fuel	default value Ecoinvent datarecord	l/100km
Transport distance Transoceanic ship	20202	km
Transport distance Truck 16-32 t EURO6	175	km
Transport distance Truck 16-32 t EURO5	20	km
Capacity utilisation (including empty runs)	default value Ecoinvent data record	%
Gross density of products transported	default value Ecoinvent data record	kg/m^3
Capacity utilisation volume factor	default value Ecoinvent data record	-
Eg. Transport truck CO2 emissions	0.0862	kg CO2e / tkm
Eg. Transport freight container ship	0.0093	kg CO2e / tkm

Installation into the building (A5)
The WINDPANEL® Standard and WINDPANEL® Premium board is cut and machined using conventional woodworking equipment with cement-suitable blades. Fixing the boards will require appropriate means, which will depend upon the application and bearing structure. Boards can be installed using staples, screws, anchors or glue. In the EPD steel screws have been assumed.
In some applications the boards are installed on a substructure. Note that the substructure is not included in the scope of the EPD.

Name	Value	Unit
Auxiliary Steel screws	0.032	kg
Auxiliary Tape	1.06	m
Electricity consumption	0.0258	kWh
Material loss	5	%

Use or application of the installed product (B1) see section 2.12 "Use"
Carbonation
The WINDPANEL® Standard and WINDPANEL® Premium boards are permanently installed in the building and in properly designed situation and under normal conditions of use, do not require any repair, maintenance or replacement.

The only impact during the use phase is that of carbonation, where some CO_2 is adsorbed from the atmosphere over the life of the board. Depending on the application where the boards are used, the degree of carbonation will vary.

The carbonation was calculated to be as follows and reported in the B1 module as shown below,
- B1 - Outdoor sheltered from rain: -1.26 kg CO_2eq / 1 m² 8 mm.

Name	Value	Unit

Maintenance (B2)
In properly designed situations and under normal conditions of use no maintenance is required.

Name	Value	Unit

Repair (B3)
In properly designed situations and under normal conditions of use no repair is required.

Name	Value	Unit

Replacement (B4) / Refurbishment (B5)
In properly designed situations and under normal conditions of use no replacement/refurbishment is required.

Name	Value	Unit

The RSL of WINDPANEL® Standard and WINDPANEL® Premium board is estimated at 60y.

Reference service life

Name	Value	Unit
Life Span according to the manufacturer	60	a
Declared product properties (at the gate) and finishes	See paragraph 2.3	-
Design application parameters (if instructed by the manufacturer), including the references to the appropriate practices and application codes	See SINTEF Certification No. 20538	-
An assumed quality of work, when installed in accordance with the manufacturer's instructions	See SINTEF Certification No. 20538	-

Operational energy use (B6) and Operational water use (B7)
Not relevant

Name	Value	Unit

End of life (C1-C4)
For this EPD, both 100% recycling and 100% landfill scenario have been calculated.
Note that during the recycling process, the fibres will be sieved out and incinerated for energy recovery, the remaining part will be recycled as a replacement for limestone fillers.

Name	Value	Unit
Collected as mixed construction waste	16.2	kg
Recycling (fibres are incinerated for energy recovery. Remaining part is recycled as limestone filler replacement)	16.2	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information
In module D, the benefits and loads beyond the system boundaries are quantified.

For the 100 % landfill scenario, no benefits and loads have been considered in module D, apart from some minor benefits and loads regarding the recycling and energy recovery of packaging

For the 100% recycling scenario, benefits from energy recovery during incineration of the fibres is included, as partly avoided impact of electricity (average EU grid mix) and partly avoided

impact of the production of heat from natural gas. Also, the benefits from recycling the remaining calcium silicate board is included as an avoided impact of production of the 100 % virgin limestone. In addition, some minor benefits and loads regarding the recycling and energy recovery of packaging are allocated to module D.

Name	Value	Unit

5. LCA: Results

As the product contains slaked lime Ca(OH)2 and cement carbonation happens during the use phase. The carbonation for outdoor use has been included in module B1.

For the end of life both 100 % recycling and 100 % landfill have been calculated, in respective modules C2/1-D/1 and C2/2-D/2.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End-of-life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	MNR	MNR	MNR	X	X	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m^2 WINDPANEL® Premium

Parameter	Unit	A1	A2	A3	A4	A5	B1	B2	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
GWP-total	kg CO_2 eq	2.17E+00	3.89E-01	3.43E+00	2E+00	1.22E+00	-1.26E+00	0	0	0	8.16E-03	3.54E-01	7.55E-02	7.57E-01	4.61E-05	1.42E-01	9.22E-01	-4.24E-01	-2.45E-01
GWP-fossil	kg CO_2 eq	2.93E+00	3.88E-01	3.75E+00	1.99E+00	9.08E-01	-1.26E+00	0	0	0	8.09E-03	3.54E-01	7.54E-02	2.85E-02	4.57E-05	1.42E-01	1.94E-01	-2.9E-01	-1.12E-01
GWP-biogenic	kg CO_2 eq	-7.6E-01	1.39E-04	-3.15E-01	4.92E-04	3.13E-01	0	0	0	0	4.49E-05	1.26E-04	2.7E-05	7.28E-01	2.47E-07	5.42E-06	7.28E-01	-1.33E-01	-1.33E-01
GWP-luluc	kg CO_2 eq	1.46E-03	2.78E-04	1.13E-03	1.36E-03	7.95E-04	0	0	0	0	1.91E-05	1.41E-04	3.02E-05	4.52E-05	1.06E-07	3E-06	4.17E-05	-3.79E-04	-2E-04
ODP	kg CFC11 eq	1.51E-07	8.12E-08	1.68E-07	4.05E-07	9.86E-08	0	0	0	0	4.07E-10	8.19E-08	1.75E-08	4.51E-09	2.37E-12	9.63E-10	2.04E-08	-3.15E-08	-1.15E-08
AP	mol H^+ eq	7.43E-03	4.23E-03	1.72E-02	5.63E-02	6.68E-03	0	0	0	0	4.6E-05	1E-03	2.14E-04	3.04E-04	2.62E-07	3.7E-05	5E-04	-1.06E-03	-4.24E-04
EP-freshwater	kg P eq	3.81E-05	2.99E-06	7.23E-05	8.17E-06	2.43E-05	0	0	0	0	8.65E-07	2.52E-06	5.38E-07	1.93E-06	4.79E-09	9.69E-08	1.71E-06	-1.39E-05	-6.02E-06
EP-marine	kg N eq	1.97E-03	1.18E-03	3.29E-03	1.38E-02	1.41E-03	0	0	0	0	5.87E-06	2E-04	4.26E-05	1.05E-04	3.49E-08	1.54E-05	1.73E-04	-2.21E-04	-9.11E-05
EP-terrestrial	mol N eq	2.25E-02	1.31E-02	3.55E-02	1.54E-01	1.56E-02	0	0	0	0	6.76E-05	2.22E-03	4.74E-04	1.18E-03	4.01E-07	1.67E-04	1.91E-03	-2.52E-03	-1.03E-03
POCP	kg NMVOC eq	6.19E-03	3.54E-03	1.02E-02	4E-02	4.58E-03	0	0	0	0	1.86E-05	8.55E-04	1.82E-04	3.09E-04	1.12E-07	4.25E-05	5.39E-04	-8.1E-04	-3.9E-04
ADPE	kg Sb eq	6.35E-06	8.06E-07	3.83E-06	2.59E-06	8.12E-06	0	0	0	0	4.37E-08	9.57E-07	2.04E-07	1.3E-07	2.59E-10	1.55E-08	1.4E-07	-8.32E-07	-2.69E-07
ADPF	MJ	1.42E+01	5.45E+00	4.03E+01	2.62E+01	1.28E+01	0	0	0	0	1.71E-01	5.36E+00	1.14E+00	4.64E-01	9.56E-04	2.99E-02	1.53E+00	-5.24E+00	-1.93E+00
WDP	m^3 world eq deprived	7.61E-01	1.84E-02	3.57E-01	5.1E-02	2.97E-01	0	0	0	0	2.01E-03	1.63E-02	3.48E-03	9.54E-03	1.12E-05	1.68E-03	8.7E-03	-7.71E-02	-4.17E-02

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m^2 WINDPANEL® Premium

Parameter	Unit	A1	A2	A3	A4	A5	B1	B2	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
PERE	MJ	5.05E+00	6.46E-02	4.54E+00	2.04E-01	2.27E+00	0	0	0	0	3.41E-02	7.53E-02	1.61E-02	7.12E-02	1.88E-04	2.88E-03	8.02E-02	0	0
PERM	MJ	6.82E+00	0	3.08E+00	0	-1.93E+00	0	0	0	0	0	0	0	-6.35E+00	0	0	0	7.64E+00	1.29E+00
PERT	MJ	1.19E+01	6.46E-02	7.62E+00	2.04E-01	3.47E-01	0	0	0	0	3.41E-02	7.53E-02	1.61E-02	-6.28E+00	1.88E-04	2.88E-03	8.02E-02	7.64E+00	1.29E+00
PENRE	MJ	1.62E+01	5.54E+00	5.23E+01	2.61E+01	1.47E+01	0	0	0	0	2.04E-01	5.39E+00	1.15E+00	5.48E-01	1.14E-03	7.28E-01	2.27E+00	0	0
PENRM	MJ	1.11E-01	0	1.44E-01	0	-1.52E-01	0	0	0	0	0	0	0	0	0	-6.92E-01	-6.92E-01	9.49E-02	9.49E-02
PENRT	MJ	1.63E+01	5.54E+00	5.25E+01	2.61E+01	1.45E+01	0	0	0	0	2.04E-01	5.39E+00	1.15E+00	5.48E-01	1.14E-03	3.67E-02	1.58E+00	9.49E-02	9.49E-02
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	1.53E-02	3.11E-04	5.89E-03	1.01E-03	7.38E-03	0	0	0	0	1.29E-04	3.94E-04	8.41E-05	5.57E-04	7.14E-07	6.49E-05	1.68E-03	-1.41E-02	-1.36E-03

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 fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2:
1 m^2 WINDPANEL® Premium

Parameter	Unit	A1	A2	A3	A4	A5	B1	B2	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
HWD	kg	1.41E-05	1.25E-05	4.59E-05	3.17E-05	4.51E-05	0	0	0	0	1.3E-07	1.4E-05	2.98E-06	5.93E-07	7.84E-10	1.06E-07	1.75E-06	-8.91E-06	-4.99E-06
NHWD	kg	9.78E-02	1.96E-01	2.55E-01	2.81E-01	3.6E-01	0	0	0	0	6.28E-04	2.81E-01	5.99E-02	9.65E-03	3.72E-06	3.55E-03	8.65E+00	-1.32E-02	-4.68E-03
RWD	kg	6.71E-05	3.58E-05	6.41E-05	1.81E-04	5.31E-05	0	0	0	0	1.25E-06	3.62E-05	7.73E-06	2.94E-06	6.94E-09	1.11E-07	1.04E-05	-2.05E-05	-6.43E-06
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	2.18E-03	0	5.38E-01	0	0	0	0	0	0	0	8.68E+00	3.03E-02	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	3.59E-03	0	9.13E-02	0	0	0	0	0	0	0	0	0	6.92E-02	6.92E-02	0	0
EET	MJ	0	0	7.17E-03	0	1.83E-01	0	0	0	0	0	0	0	0	0	1.38E-01	1.38E-01	0	0

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:
1 m^2 WINDPANEL® Premium

Parameter	Unit	A1	A2	A3	A4	A5	B1	B2	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
PM	Disease incidence	7.84E-08	2.52E-08	2.35E-07	7.61E-08	5.1E-08	0	0	0	0	1.27E-10	2.84E-08	6.06E-09	2.45E-09	8.71E-13	2.58E-10	9.23E-09	-1.2E-08	-6.83E-09
IR	kBq U235 eq	5.08E-02	2.26E-02	4.96E-02	1.12E-01	4.42E-02	0	0	0	0	1.52E-03	2.33E-02	4.96E-03	3.35E-03	8.39E-06	1.18E-04	7.77E-03	-2.36E-02	-7.06E-03
ETP-fw	CTUe	3.74E+01	4.46E+00	8.34E+01	1.68E+01	1.78E+01	0	0	0	0	1.09E-01	4.21E+00	8.97E-01	1.35E+00	6.33E-04	3.83E-01	1.24E+00	-2.95E+00	-1.62E+00
HTP-c	CTUh	6.14E-10	1.73E-10	1.57E-09	1.14E-09	4.83E-09	0	0	0	0	3.33E-12	1.35E-10	2.89E-11	1.68E-10	3.19E-14	2.83E-11	5.33E-11	-3.62E-11	2.43E-11
HTP-nc	CTUh	2.42E-08	3.83E-09	3.16E-08	1.21E-08	1.17E-08	0	0	0	0	1.07E-10	4.25E-09	9.07E-10	1.26E-09	6.24E-13	2.66E-10	7.71E-10	-9.54E-09	-8.25E-09
SQP	SQP	7.85E+01	3.18E+00	4.16E+01	5.95E+00	9.3E+00	0	0	0	0	3.11E-02	3.74E+00	7.97E-01	2.23E-01	6.26E-04	9.89E-03	2.84E+00	-1.53E+01	-1.45E+01

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

6. LCA: Interpretation

For WINDPANEL® Standard and WINDPANEL® Premium, the raw materials used in the formulation mix together with the manufacturing and the transport to installation have the highest contribution on all impact categories. Cement and hydrated lime are the most important raw materials in terms of environmental impact. With respect to manufacturing, it is the energy consumption from electricity and steam that contributes the most. The transport to installation is significant as the transport from China to Europe has been taken into account.

7. Requisite evidence

Not relevant for this product

8. References

Standards

EN 826
Determination of Compression Behavior of Thermal Insulation Products

EN 1607
Thermal insulation products for building applications - determination of tensile strength perpendicular to faces

EN 1608
Thermal insulating products for building applications - Determination of tensile strength parallel to faces

EN 12467 Fibre-cement flat sheets - Product specification and test methods

EN15804
EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of
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EN 16757
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Product Category Rules for concrete and concrete elements

ISO 9001
ISO 9001:2015:Quality management systems — Requirements

ISO 14001
ISO 14001:2015: Environmental management systems — Requirements with guidance for use

ISO 14025
EN ISO 14025:2011, Environmental labels and declarations — Type III environmental declarations
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ISO 14040
ISO 14040:2006: Environmental management – Life cycle assessment – Principles and framework.

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ISO 45001:2018: Occupational health and safety management systems Requirements with guidance for use

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Guidance, version 6.3.

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