

Owner: Cembrit Holding A/S  
No.: MD-18011-EN  
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Valid to: 21-03-2023

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3<sup>rd</sup> PARTY VERIFIED

**EPD**

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VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804



### Owner of declaration

Cembrit Holding A/S  
Sohngårdsholmsvej 2  
9000 Aalborg



**Issued:**  
21-03-2018

**Valid to:**  
21-03-2023

### Programme operator

Danish Technological Institute  
www.dti.dk



### Basis of calculation

This EPD is developed in accordance with the European standard EN 15804.

### Programme

EPD Danmark  
www.epddanmark.dk



### Comparability

EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

### Validity

This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

### Declared products

Cembrit Solid  
Cembrit Express+  
Cembrit Cover  
Cembrit Patina

### Use

The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

### Production site

Bécsi út 7  
2536 Nyergesújfalu  
Hungary

### EPD type

- Cradle-to-gate
- Cradle-to-gate with options
- Cradle-to-grave

### Products use

Cembrit fiber cement decorative rain screen claddings for mounting on facades or roofs on wooden or metal substructures with the principle of back-ventilated curtain facades.

CEN standard EN 15804 serves as the core PCR
Independent verification of the declaration and data, according to EN ISO 14025
<input type="checkbox"/> internal <input checked="" type="checkbox"/> external
Third party verifier:  Kim Christiansen

### Declared unit

1 tonne

Henrik Fred Larsen  
EPD Danmark

### Life cycle stages and modules (MND = module not declared)

Product			Construction process		Use								End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
<b>X</b>	<b>X</b>	<b>X</b>	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	

## Product information

### Product description

The main product components are shown in the table below. Values are given as intervals covering the four declared product variations. Specific recipes and some input materials (0-2 mass-%) are not shown in this table due to reasons of confidentiality.

Material	Weight-% of declared product
Cement	40-85
Limestone	0-15
Silica sand	0-40
Wollastonite	0-15
Cellulose fibres	4-15
Paint/pigments	1-4
PVA fibres	0-2
SWP fibres	0-2
Water glass	0-2
Packaging material	kg per declared unit
PE film	2,84
Pallets	28,2
Cardboard	0,56
Plastic strips	0,095
Labels	0,0029

### Representativity

This declaration, including data collection and the modelled foreground system including results, represents the production of 1 tonne of Cembrit fibre cement boards on the production site located in Hungary. Product specific data are based on average values collected in the period from 01.01.2017 to 30.06.2017. As such, not a full year's average is used. This deviation from normal practice is due to some major changes in the product compositions in the beginning of 2017. Background data are based mainly on GaBi and are less than 10 years old. For a few exceptions, GaBi data was supplemented with data from ecoinvent. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old and therefore the requirements in EN15804 are met.

### Dangerous substances

Cembrit fibre cement boards does not contain substances listed in the "Candidate List of Substances of Very High Concern for authorisation"

(<http://echa.europa.eu/candidate-list-table>)

### Essential characteristics (CE)

Cembrit fibre cement boards are covered by harmonised technical specification EN 12467. Declaration of performance according to EU regulation 305/2011 is available for all declared product variations. Further technical information can be obtained by contacting the manufacturer or on the manufacturers website:

<https://www.cembrit.com/>

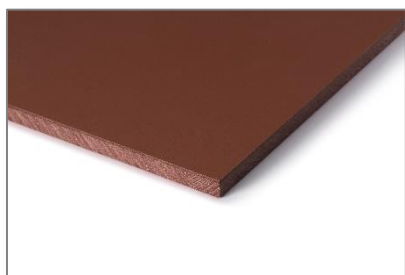
### Reference Service Life

No RSL is declared. This EPD is based on a cradle-to-gate assessment.

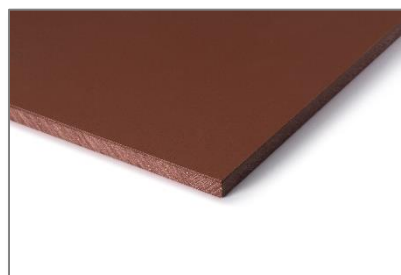
(RSL)

## Product illustrations

SOLID



EXPRESS+



COVER



PATINA



## LCA background

### Declared unit

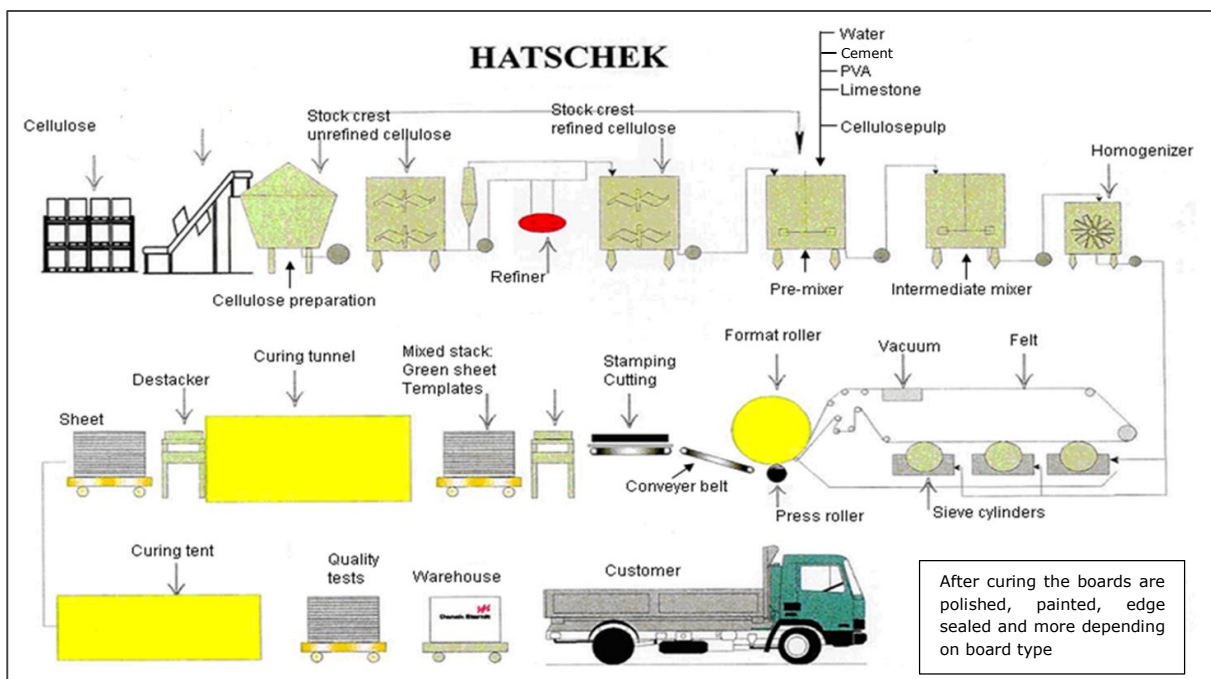
The LCI and LCIA results in this EPD relates to 1 tonne of Cembrit fibre cement board for the types: Cembrit Solid, Cembrit Express+, Cembrit Cover and Cembrit Patina.

Name	Value	Unit
Declared unit	1	T
Apparent density Solid (DoP)	≥1.550	kg/m <sup>3</sup>
Apparent density Express+ (DoP)	≥1.550	kg/m <sup>3</sup>
Apparent density Cover (DoP)	≥1.550	kg/m <sup>3</sup>
Apparent density Patina (DoP)	≥1.250	kg/m <sup>3</sup>
Conversion factor to 1 kg.	0,001	-

### PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804.

### Flow diagram



### System boundaries

This EPD is based on a cradle-to-gate LCA, in which >99 weight-% has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

**Product stage (A1-A3) includes:**

- A1 – Extraction and processing of raw materials
- A2 – Transport to the production site
- A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the "end-of-waste" state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

Cembrit boards are produced according to the Hatschek method: the base materials (binder, fibers, etc) are processed into a homogeneous mixture with water and transferred to the vats of the Hatschek machine. Rotating sieve cylinders in the vats collect a thin layer of solid material and transfer the layer to a rotating felt for dewatering and further on to the accumulating format roller. The format roller is gradually covered by layers of fibre cement and once the required board thickness is reached, the fibre cement layer, still moist and moldable, is unwound and taken from the roll. Further information on the Hatschek method may be found here:

<http://www.fibreconsulting.com/publications/011011.hatschekfilmsummary.pdf>

The fibre cement "green sheet" board is cut, and remaining leftovers from this cutting process are returned to the manufacturing process, so that no waste is produced. The cut "green" board is piled up and compressed. The boards are then stored for curing and temporarily deposited in storage. Generally, storage period lasts up to four weeks.

After pre-curing period the Patina boards are dried by autoclave, which runs on electricity. The other board types (Solid, Express+ and Cover) are just air-dried. After the drying process, products are ready to be polished, trimming edges, cutting to pieces, painted, edge-sealed, hydrophobated, depending on type, and further on to quality controls and packing processes.

## LCA results

ENVIRONMENTAL IMPACTS PER TONNE					
Parameter	Unit	Cembrit Solid	Cembrit Express+	Cembrit Cover	Cembrit Patina
		A1-A3	A1-A3	A1-A3	A1-A3
GWP	[kg CO <sub>2</sub> -eq.]	1,79E+03	1,79E+03	1,76E+03	7,92E+02
ODP	[kg CFC11-eq.]	6,84E-07	6,84E-07	6,84E-07	4,12E-07
AP	[kg SO <sub>2</sub> -eq.]	4,46E+00	4,46E+00	4,38E+00	2,94E+00
EP	[kg PO <sub>4</sub> <sup>3-</sup> -eq.]	4,97E-01	4,97E-01	4,89E-01	3,69E-01
POCP	[kg ethene-eq.]	7,81E-01	7,81E-01	7,72E-01	2,84E-01
ADPE	[kg Sb-eq.]	3,64E-02	3,64E-02	3,64E-02	2,47E-02
ADPF	[MJ]	2,08E+04	2,08E+04	2,06E+04	9,38E+03
Caption	GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential of soil and water; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential for non fossil resources; ADPF = Abiotic depletion potential for fossil resources				

RESOURCE USE PER TONNE					
Parameter	Unit	Cembrit Solid	Cembrit Express+	Cembrit Cover	Cembrit Patina
		A1-A3	A1-A3	A1-A3	A1-A3
PERE	[MJ]	2,64E+03	2,64E+03	2,63E+03	4,27E+03
PERM*	[MJ]	1,07E+03	1,07E+03	1,07E+03	2,33E+03
PERT	[MJ]	3,71E+03	3,71E+03	3,70E+03	6,60E+03
PENRE	[MJ]	2,28E+04	2,28E+04	2,25E+04	1,21E+04
PENRM**	[MJ]	1,51E+03	1,51E+03	1,51E+03	1,48E+02
PENRT	[MJ]	2,43E+04	2,43E+04	2,41E+04	1,22E+04
SM	[kg]	-	-	-	-
RSF	[MJ]	5,61E-06	5,61E-06	5,61E-06	5,61E-06
NRSF	[MJ]	5,16E-05	5,16E-05	5,16E-05	5,16E-05
FW	[m <sup>3</sup> ]	7,32E+00	7,32E+00	7,28E+00	4,75E+00
Caption	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				

\* Contribution from packaging material per product type: 5,40E+02 MJ \*\* Contribution from packaging material per product type: 1,25E+02 MJ

OUTPUT FLOWS AND WASTE CATEGORIES PER TONNE					
Parameter	Unit	Cembrit Solid	Cembrit Express+	Cembrit Cover	Cembrit Patina
		A1-A3	A1-A3	A1-A3	A1-A3
HWD	[kg]	3,25E+00	3,25E+00	3,25E+00	1,06E-01
NHWD	[kg]	2,44E+02	2,44E+02	2,44E+02	1,15E+02
RWD	[kg]	1,40E+00	1,40E+00	1,39E+00	1,12E+00
CRU	[kg]	-	-	-	-
MFR	[kg]	-	-	-	-
MER	[kg]	-	-	-	-
EEE	[MJ]	-	-	-	-
EET	[MJ]	-	-	-	-
Caption	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				



## Additional information

### Indoor air

*The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.*

### Soil and water

*The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.*



## References

<b>Publisher</b>	 <a href="http://www.epddanmark.dk">http://www.epddanmark.dk</a>
<b>Programme operator</b>	Danish Technological Institute Sustainable Construction Kongsvang Allé 29 DK-8000 Aarhus C <a href="http://www.teknologisk.dk">http://www.teknologisk.dk</a>
<b>LCA-practitioner</b>	Danish Technological Institute Sustainable Construction Gregersensvej DK-2630 Taastrup <a href="http://www.teknologisk.dk">http://www.teknologisk.dk</a>
<b>LCA software / background data</b>	Thinkstep GaBi 8.2 2017 incl. databases + Ecoinvent 3 2017  <a href="http://www.gabi-software.com">http://www.gabi-software.com</a> <a href="http://www.ecoinvent.org">http://www.ecoinvent.org</a>
<b>3<sup>rd</sup> party verifier</b>	Kim Christiansen – kimconsult.dk

### General programme instructions

Version 1.9

[www.epddanmark.dk](http://www.epddanmark.dk)

#### EN 15804

DS/EN 15804 + A1:2013 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

#### EN 15942

DS/EN 15942:2011 – " Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

#### ISO 14025

DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

#### ISO 14040

DS/EN ISO 14040:2008 – " Environmental management – Life cycle assessment – Principles and framework"

#### ISO 14044

DS/EN ISO 14044:2008 – " Environmental management – Life cycle assessment – Requirements and guidelines"