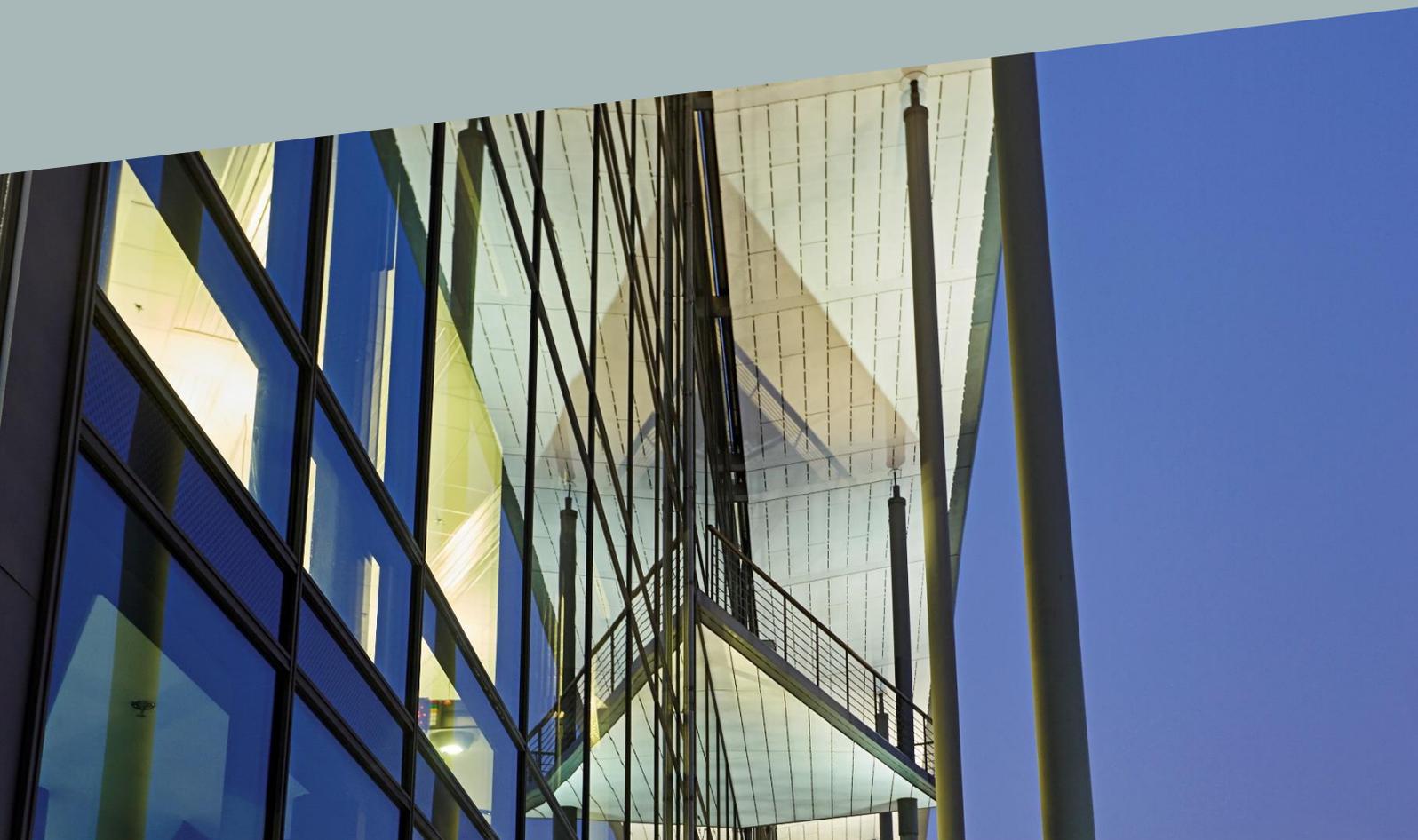


Owner: Cembrit Holding A/S
No.: MD-21010-EN
Issued: 18-10-2021
Valid to: 18-10-2026

3rd PARTY VERIFIED

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804



Owner of declaration
 Cembrit Holding A/S
 Gasværksvej 24
 9000 Aalborg
 CVR-nr. 18336774



Issued:
18-10-2021

Valid to:
18-10-2026

Programme
 EPD Danmark
 www.epddanmark.dk



Basis of calculation

This EPD is developed in accordance with the European standard EN 15804:2012+A2:2019.

Comparability

EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804:2019+A2. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804:2012+A2:2019 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.

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.

- Industry EPD
- Product EPD

Declared products

Cembrit Windstopper Extreme (Natural & Dark grey)
 Cembrit Windstopper Extreme (Anthracite)
 Cembrit Windstopper Basic
 Cembrit Construction
 Cembrit Construction (Anthracite)
 Cembrit Multi Force

Number of declared datasets/product variations: 6

Production site

Mineraalintie 1
 08680 Lohja
 Finland

Products use

The Cembrit fibre cement boards; Windstopper Extreme, Windstopper Extreme (Anthracite) and Windstopper Basic are wind barrier boards in exterior wall constructions. Cembrit Construction and Construction (Anthracite) are untreated fibre cement building board which can be installed for facade purpose. Cembrit Multi Force is an indoor interior cladding panel. The material inputs are shown in table 2.

Declared unit

1 m² fibre cement board with a thickness of 9 mm

Year of data

2019

EPD type

- Cradle-to-gate with modules C1-C4 and D
- Cradle-to-gate with options, modules C1-C4 and D
- Cradle-to-grave and module D
- Cradle-to-gate
- Cradle-to-gate with options

CEN standard EN 15804:2012+A2:2019 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

internal external

Third party verifier:

Ninkie Bendtsen

Ninkie Bendtsen

Henrik Fred Larsen

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
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Product information

Product description

The main product components are shown in the table below. Values are given as intervals covering the six declared product variations with a thickness of 9 mm.

Material	Weight-% of declared product
Cement	35-59%
Limestone	14-60%
Cellulose ¹ /fibres	0-7%
Pigment	0-6%
Filler	0-15%
Perlite	0-14%
Packaging material	kg per declared unit
Pallets	0.028-0.04
Plastic foil - top	0.0044-0.007
Stretch foil	0.0036-0.005

Representativity

This declaration including data collection and the modelled foreground system, represents the production of 1 m² of Cembrit fibre cement board on the production site located in Finland. Product specific data are based on average 2019 production values collected in 2020. Background data are mainly based on GaBi and are less than 10 years old. For a few exceptions, GaBi data was supplemented with data from Ecoinvent version 3.7.1 (2020). Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old, which meets the requirements in EN 15804:2012+A2:2019.

Hazardous substances

Cembrit facade boards do 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 the 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 manufacturer's website:

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

Reference Service Life (RSL)

Cembrit's fibre cement boards have an estimated service life in excess of 30 years when installed and used correctly.

¹ The Cellulose used in production of the declared cembrit boards is FSC Certified.

Picture of products

Cembit build products

Cembit Windstopper Extreme (Natural grey)



Cembit Windstopper Extreme (Dark grey)



Cembit Windstopper Extreme (Anthracite)



Cembit Windstopper Basic



Cembit Construction



Cembit Construction (Anthracite)



Cembit indoor products

Cembit Multi Force



LCA background

Declared unit

The LCI and LCIA results in this EPD relates to 1 m² of Cembrit fibre cement boards with a thickness of 9 mm for types: Cembrit Windstopper Extreme, Cembrit Windstopper Extreme (Anthracite), Cembrit Windstopper Basic, Cembrit Construction, Cembrit Construction (Anthracite) and Cembrit Multi Force.

Cembrit produces Cembrit Windstopper Extreme and Cembrit Windstopper Extreme (Anthracite) in 4.5 mm and 9 mm. Cembrit Construction is produced with a thickness of 6 mm, 8 mm and 10 mm. Cembrit Construction (Anthracite) is produced with a thickness of 8 mm. Cembrit Multi Force is produced with a thickness of both 9mm and 12 mm. In this EPD a conversion was made so that the density and results are calculated and shown for 9 mm boards for the sake of comparison.

Cembrit Windstopper Extreme is produced both in a natural grey colour and a dark grey colour, the production and materials are the same, except in the dark grey module there is a small amount of pigment. In this EPD the two colour variants are modelled as one product, where an average of the

production between the two colour variants has been applied to calculate the amount of pigment.

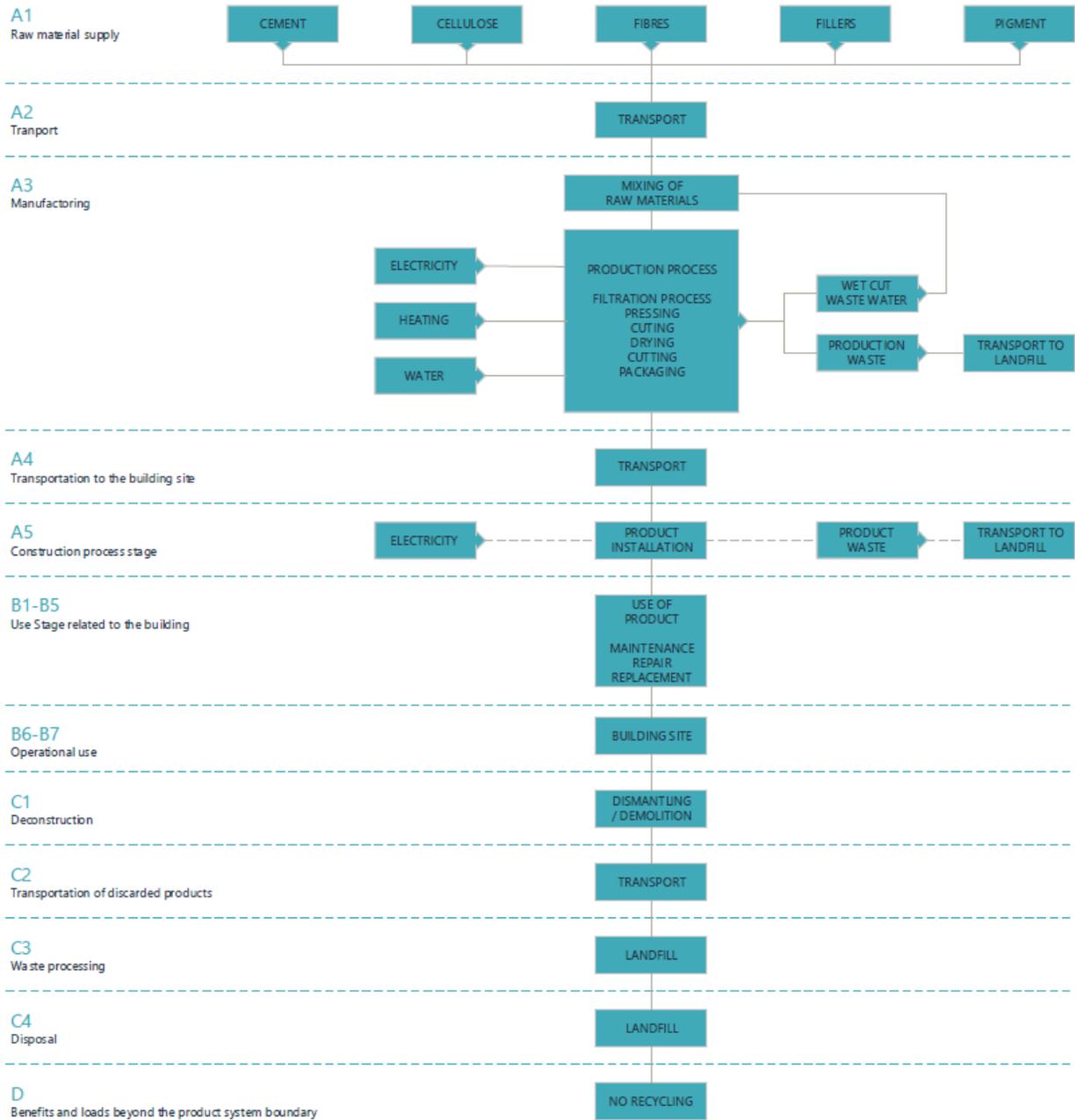
Results for these variations can be converted to the various thicknesses using the conversion factor described in the results.

Name	Value	Unit	Conversion factor to 1 kg.
Declared unit	1	m ²	
Cembrit Windstopper Extreme	14.4	kg/m ²	0.069
Cembrit Windstopper Extreme (Anthracite)	14.4	kg/m ²	0.069
Cembrit Windstopper Basic	13.3	kg/m ²	0.075
Cembrit Construction	16.8	kg/m ²	0.060
Cembrit Construction (Anthracite)	16.8	kg/m ²	0.067
Cembrit Multi Force	10.0	kg/m ²	0.100

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804:2012+A2:2019.

Flow chart



System boundary

This EPD is based on a cradle-to-grave + module D, in which >99 weight-% has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804:2012+A2:2019, 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.

Data collection and measurements includes all processes, materials or emissions that are known to make a significant contribution to the environmental impact of producing fibre cement boards at Cembrit Holding A/S. All these emissions were considered in the model. Therefore, there has been no exclusion of inputs and outputs above these limits.

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 fibre cement boards are produced according to a flow-on method, partly automated to a certain extent. The base materials are processed into a homogeneous mixture with water and applied to a running endless felt loop, from which part of the water is filtered through the felt material. The evacuated water is returned to the process, and no wastewater is produced.

The format roller is gradually covered by layers of fibre cement. When the required thickness of the boards is reached, it is applied to a format roll which is gradually covered by layers of fibre cement material. Once the required thickness is

reached, the fibre cement layer is taken from the roll, cut, piled and compressed. The boards are cured in an oven, which runs on natural gas. After the drying process the products are ready to be sanded, trimming edges, cutting to customised size, painted, edge-sealed, ending with quality controls and packing processes.

Construction process stage (A4-A5) includes:

A4 – Transportation simulating transportation to a construction site in Europe. This scenario uses an average truck, transporting goods at a distance of 3,300 km. Transportation of the packaging waste from the construction site to the municipal waste incinerator are also included in this module.

A5 – Accounts for the environmental impacts associated with the disposal of packaging handled at the construction site. It is assumed incinerated at an incineration plant which is assumed to be the most likely and realistic situation. Disposal of product waste is assumed to be landfilled. Furthermore, environmental impacts associated with trucks and fuel for the construction installation. The mounting of the boards is done by using smaller electrical tools e.g. screwdriver. It is estimated that the energy for the hand tool is very low and below the cut-off criteria of 1% and is therefore excluded.

Use stage (B1-B7) includes:

Modules are not relevant for this product.

End of Life (C1-C4) includes:

C1 – Accounts for the environmental impacts associated with dismantling and demolition of the fibre cement boards. Fuel used for demolition equipment and transport on site vehicles.

C2 – Transportation of the discarded products from the construction site to a landfilling site. The transport is estimated to be 100 km in an average truck.

C3 – The fibre cement boards are sent to landfill and therefore there is no environmental impacts associated with waste processing of materials flows intended for reuse, recycling or energy recovery.

C4 – Environmental impacts associated with the processes at the landfill.

Re-use, recovery and recycling potential (D) includes:

D - The fibre cement boards are sent to landfill after use. The product has therefore no impact during this stage and no associated environmental impacts. The Cembrit boards are expected to be reusable over time, but this is not included in the actual LCA calculation.

LCA results

Cembrit Windstopper Extreme

The declared unit is for 1 m² of Cembrit Windstopper Extreme with a thickness of 9 mm. A conversion factor 0.5 must be applied, when calculating results LCIA results for Cembrit Windstopper Extreme with a thickness of 4.5 mm.

ENVIRONMENTAL IMPACTS PER m ² CEMBRIT WINDSTOPPER EXTREME										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	9.36E+00	2.80E+00	2.17E-02	0.00E+00	8.47E-03	1.04E-01	0.00E+00	1.91E-01	0.00E+00
GWP-fossil	[kg CO ₂ eq.]	9.55E+00	2.74E+00	2.20E-02	0.00E+00	8.79E-03	1.02E-01	0.00E+00	2.07E-01	0.00E+00
GWP-biogenic	[kg CO ₂ eq.]	-1.99E-01	2.99E-02	-3.00E-04	0.00E+00	-3.86E-04	1.11E-03	0.00E+00	-1.64E-02	0.00E+00
GWP-luluc	[kg CO ₂ eq.]	7.30E-03	2.25E-02	5.48E-05	0.00E+00	6.83E-05	8.40E-04	0.00E+00	5.95E-04	0.00E+00
ODP	[kg CFC 11 eq.]	5.69E-08	5.10E-16	-9.85E-17	0.00E+00	1.55E-18	1.90E-17	0.00E+00	7.66E-16	0.00E+00
AP	[mol H ⁺ eq.]	2.09E-02	3.10E-03	2.25E-05	0.00E+00	4.31E-05	1.20E-04	0.00E+00	1.48E-03	0.00E+00
EP-freshwater	[kg PO ₄ eq.]	2.35E-04	8.47E-06	-1.43E-08	0.00E+00	2.57E-08	3.16E-07	0.00E+00	3.55E-07	0.00E+00
EP-marine	[kg N eq.]	6.11E-03	9.29E-04	1.44E-05	0.00E+00	1.99E-05	3.68E-05	0.00E+00	3.82E-04	0.00E+00
EP-terrestrial	[mol N eq.]	6.62E-02	1.11E-02	1.73E-04	0.00E+00	2.21E-04	4.37E-04	0.00E+00	4.19E-03	0.00E+00
POCP	[kg NMVOC eq.]	1.76E-02	2.55E-03	4.11E-05	0.00E+00	5.59E-05	9.93E-05	0.00E+00	1.16E-03	0.00E+00
ADPm ¹	[kg Sb eq.]	5.51E-05	2.25E-07	-9.82E-10	0.00E+00	6.82E-10	8.39E-09	0.00E+00	1.86E-08	0.00E+00
ADPf ¹	[MJ]	8.13E+01	3.71E+01	-4.45E-02	0.00E+00	1.13E-01	1.38E+00	0.00E+00	2.71E+00	0.00E+00
WDP ¹	[m ³]	1.09E+00	2.71E-02	9.25E-04	0.00E+00	8.23E-05	1.01E-03	0.00E+00	2.17E-02	0.00E+00
Caption	GWP-total = Global Warming Potential - total; 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 = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER m ² CEMBRIT WINDSTOPPER EXTREME										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PM	[Disease incidence]	2.76E-07	2.10E-08	3.37E-10	0.00E+00	4.85E-10	7.95E-10	0.00E+00	1.84E-08	0.00E+00
IRP ²	[kBq U235 eq.]	6.77E-01	1.01E-02	-2.15E-03	0.00E+00	3.07E-05	3.78E-04	0.00E+00	3.18E-03	0.00E+00
ETP-fw ¹	[CTUe]	5.80E+01	2.78E+01	3.14E-02	0.00E+00	8.43E-02	1.04E+00	0.00E+00	1.55E+00	0.00E+00
HTP-c ¹	[CTUh]	1.91E-09	5.74E-10	1.61E-13	0.00E+00	1.74E-12	2.14E-11	0.00E+00	2.30E-10	0.00E+00
HTP-nc ¹	[CTUh]	1.34E-07	2.91E-08	4.76E-11	0.00E+00	1.02E-10	1.09E-09	0.00E+00	2.53E-08	0.00E+00
SQP ¹	-	5.67E+01	1.30E+01	-1.10E-01	0.00E+00	3.95E-02	4.86E-01	0.00E+00	5.65E-01	0.00E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									
	² 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.									

RESOURCE USE PER m ² CEMBRIT WINDSTOPPER EXTREME										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PERE	[MJ]	1.76E+01	2.15E+00	-5.70E-02	0.00E+00	6.51E-03	8.00E-02	0.00E+00	3.55E-01	0.00E+00
PERM	[MJ]	9.47E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.76E+01	2.15E+00	-5.70E-02	0.00E+00	6.51E-03	8.00E-02	0.00E+00	3.55E-01	0.00E+00
PENRE	[MJ]	8.14E+01	3.73E+01	-4.41E-02	0.00E+00	1.13E-01	1.39E+00	0.00E+00	2.71E+00	0.00E+00
PENRM	[MJ]	2.84E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	8.14E+01	3.73E+01	-4.41E-02	0.00E+00	1.13E-01	1.39E+00	0.00E+00	2.71E+00	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m ³]	4.32E-02	2.50E-03	6.17E-06	0.00E+00	7.59E-06	9.33E-05	0.00E+00	6.84E-04	0.00E+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 = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER m ² WINDSTOPPER EXTREME										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
HWD	[kg]	1.73E-07	1.72E-06	5.14E-09	0.00E+00	5.23E-09	6.43E-08	0.00E+00	4.13E-08	0.00E+00
NHWD	[kg]	1.57E+00	5.90E-03	2.29E-03	0.00E+00	1.79E-05	2.20E-04	0.00E+00	1.36E+01	0.00E+00
RWD	[kg]	5.52E-03	6.87E-05	-1.29E-05	0.00E+00	2.08E-07	2.56E-06	0.00E+00	3.09E-05	0.00E+00

CRU	[kg]	0.00E+00								
MFR	[kg]	0.00E+00								
MER	[kg]	5.00E-01	0.00E+00	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00								
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; EE = Exported energy									

BIOGENIC CARBON CONTENT PER DECLARED UNIT (1 m ²)		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0.6
Biogenic carbon content in accompanying packaging	kg C	0.2

Cembrit Windstopper Extreme (Anthracite)

The declared unit is for 1 m² of Cembrit Windstopper Extreme (Anthracite) with a thickness of 9 mm. A conversion factor 0.5 must be applied, when calculating results LCIA results for Cembrit Windstopper Extreme (Anthracite) with a thickness of 4.5 mm.

ENVIRONMENTAL IMPACTS PER m ² CEMBRIT WINDSTOPPER EXTREME (ANTHRACITE)										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	9.52E+00	2.94E+00	2.21E-02	0.00E+00	8.91E-03	1.10E-01	0.00E+00	2.01E-01	0.00E+00
GWP-fossil	[kg CO ₂ eq.]	9.71E+00	2.89E+00	2.24E-02	0.00E+00	9.25E-03	1.08E-01	0.00E+00	2.17E-01	0.00E+00
GWP-biogenic	[kg CO ₂ eq.]	-1.99E-01	3.14E-02	-3.21E-04	0.00E+00	-4.06E-04	1.17E-03	0.00E+00	-1.72E-02	0.00E+00
GWP-luluc	[kg CO ₂ eq.]	7.92E-03	2.37E-02	5.84E-05	0.00E+00	7.18E-05	8.83E-04	0.00E+00	6.26E-04	0.00E+00
ODP	[kg CFC 11 eq.]	5.90E-08	5.37E-16	-9.82E-17	0.00E+00	1.63E-18	2.00E-17	0.00E+00	8.06E-16	0.00E+00
AP	[mol H ⁺ eq.]	2.13E-02	3.26E-03	2.47E-05	0.00E+00	4.53E-05	1.26E-04	0.00E+00	1.56E-03	0.00E+00
EP-freshwater	[kg PO ₄ eq.]	2.50E-04	8.91E-06	-1.29E-08	0.00E+00	2.70E-08	3.32E-07	0.00E+00	3.73E-07	0.00E+00
EP-marine	[kg N eq.]	6.21E-03	9.77E-04	1.55E-05	0.00E+00	2.10E-05	3.87E-05	0.00E+00	4.01E-04	0.00E+00
EP-terrestrial	[mol N eq.]	6.75E-02	1.16E-02	1.85E-04	0.00E+00	2.32E-04	4.60E-04	0.00E+00	4.41E-03	0.00E+00
POCP	[kg NMVOC eq.]	1.78E-02	2.68E-03	4.40E-05	0.00E+00	5.88E-05	1.04E-04	0.00E+00	1.22E-03	0.00E+00
ADPm ¹	[kg Sb eq.]	5.53E-05	2.37E-07	-9.44E-10	0.00E+00	7.18E-10	8.82E-09	0.00E+00	1.95E-08	0.00E+00
ADPf ¹	[MJ]	8.33E+01	3.90E+01	-3.84E-02	0.00E+00	1.18E-01	1.46E+00	0.00E+00	2.85E+00	0.00E+00
WDP ¹	[m ³]	2.93E+00	2.85E-02	9.28E-04	0.00E+00	8.66E-05	1.06E-03	0.00E+00	2.28E-02	0.00E+00
Caption	GWP-total = Global Warming Potential - total; 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 = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER m ² CEMBRIT WINDSTOPPER EXTREME (ANTHRACITE)										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PM	[Disease incidence]	2,80E-07	2,21E-08	3,62E-10	0.00E+00	5,10E-10	8,36E-10	0.00E+00	1,93E-08	0.00E+00
IRP ²	[kBq U235 eq.]	6,63E-01	1,07E-02	-2,15E-03	0.00E+00	3,23E-05	3,97E-04	0.00E+00	3,34E-03	0.00E+00
ETP-fw ¹	[CTUe]	6,56E+01	2,92E+01	3,59E-02	0.00E+00	8,86E-02	1,09E+00	0.00E+00	1,63E+00	0.00E+00
HTP-c ¹	[CTUh]	1,93E-09	6,04E-10	2,54E-13	0.00E+00	1,83E-12	2,25E-11	0.00E+00	2,41E-10	0.00E+00
HTP-nc ¹	[CTUh]	1,35E-07	3,06E-08	5,30E-11	0.00E+00	1,07E-10	1,14E-09	0.00E+00	2,66E-08	0.00E+00
SQP ¹	-	5,67E+01	1,37E+01	-1,07E-01	0.00E+00	4,16E-02	5,11E-01	0.00E+00	5,95E-01	0.00E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									
	² 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.									

RESOURCE USE PER m² CEMBRIT WINDSTOPPER EXTREME (ANTHRACITE)

Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PERE	[MJ]	1.73E+01	2.26E+00	-5.65E-02	0.00E+00	6.85E-03	8.42E-02	0.00E+00	3.74E-01	0.00E+00
PERM	[MJ]	9.47E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.73E+01	2.26E+00	-5.65E-02	0.00E+00	6.85E-03	8.42E-02	0.00E+00	3.74E-01	0.00E+00
PENRE	[MJ]	8.33E+01	3.92E+01	-3.80E-02	0.00E+00	1.19E-01	1.46E+00	0.00E+00	2.85E+00	0.00E+00
PENRM	[MJ]	2.84E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	8.33E+01	3.92E+01	-3.80E-02	0.00E+00	1.19E-01	1.46E+00	0.00E+00	2.85E+00	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m ³]	8.54E-02	2.63E-03	6.56E-06	0.00E+00	7.98E-06	9.81E-05	0.00E+00	7.19E-04	0.00E+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 = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER m² CEMBRIT WINDSTOPPER EXTREME (ANTHRACITE)

Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
HWD	[kg]	2.20E-07	1.81E-06	5.41E-09	0.00E+00	5.50E-09	6.76E-08	0.00E+00	4.35E-08	0.00E+00
NHWD	[kg]	1.58E+00	6.21E-03	2.28E-03	0.00E+00	1.88E-05	2.32E-04	0.00E+00	1.43E+01	0.00E+00
RWD	[kg]	5.32E-03	7.22E-05	-1.29E-05	0.00E+00	2.19E-07	2.69E-06	0.00E+00	3.25E-05	0.00E+00

CRU	[kg]	0.00E+00								
MFR	[kg]	0.00E+00								
MER	[kg]	5.00E-01	0.00E+00	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00								
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; EE = Exported energy									

BIOGENIC CARBON CONTENT PER DECLARED UNIT (1 m²)

Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0.6
Biogenic carbon content in accompanying packaging	kg C	0.2

Cembrit Windstopper Basic

ENVIRONMENTAL IMPACTS PER m ² CEMBRIT WINDSTOPPER BASIC										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	6.14E+00	2.64E+00	2.03E-02	0.00E+00	7.99E-03	9.85E-02	0.00E+00	1.80E-01	0.00E+00
GWP-fossil	[kg CO ₂ eq.]	6.23E+00	2.59E+00	2.05E-02	0.00E+00	8.29E-03	9.66E-02	0.00E+00	1.95E-01	0.00E+00
GWP-biogenic	[kg CO ₂ eq.]	-9.27E-02	2.82E-02	-2.84E-04	0.00E+00	-3.64E-04	1.05E-03	0.00E+00	-1.55E-02	0.00E+00
GWP-luluc	[kg CO ₂ eq.]	3.40E-03	2.12E-02	5.19E-05	0.00E+00	6.44E-05	7.92E-04	0.00E+00	5.61E-04	0.00E+00
ODP	[kg CFC 11 eq.]	3.54E-08	4.81E-16	-9.17E-17	0.00E+00	1.46E-18	1.80E-17	0.00E+00	7.23E-16	0.00E+00
AP	[mol H ⁺ eq.]	1.31E-02	2.92E-03	2.15E-05	0.00E+00	4.06E-05	1.13E-04	0.00E+00	1.40E-03	0.00E+00
EP-freshwater	[kg PO ₄ eq.]	1.38E-04	7.99E-06	-1.30E-08	0.00E+00	2.42E-08	2.98E-07	0.00E+00	3.35E-07	0.00E+00
EP-marine	[kg N eq.]	3.90E-03	8.76E-04	1.37E-05	0.00E+00	1.88E-05	3.47E-05	0.00E+00	3.60E-04	0.00E+00
EP-terrestrial	[mol N eq.]	4.23E-02	1.04E-02	1.64E-04	0.00E+00	2.08E-04	4.12E-04	0.00E+00	3.95E-03	0.00E+00
POCP	[kg NMVOC eq.]	1.14E-02	2.40E-03	3.89E-05	0.00E+00	5.27E-05	9.37E-05	0.00E+00	1.09E-03	0.00E+00
ADPm ¹	[kg Sb eq.]	3.43E-05	2.12E-07	-9.06E-10	0.00E+00	6.44E-10	7.91E-09	0.00E+00	1.75E-08	0.00E+00
ADPf ¹	[MJ]	5.24E+01	3.50E+01	-4.01E-02	0.00E+00	1.06E-01	1.31E+00	0.00E+00	2.56E+00	0.00E+00
WDP ¹	[m ³]	5.43E-01	2.56E-02	8.63E-04	0.00E+00	7.76E-05	9.54E-04	0.00E+00	2.04E-02	0.00E+00
Caption	GWP-total = Global Warming Potential - total; 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 = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER m ² CEMBRIT WINDSTOPPER BASIC										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PM	[Disease incidence]	2.14E-07	1.98E-08	3.20E-10	0.00E+00	4.58E-10	7.50E-10	0.00E+00	1.73E-08	0.00E+00
IRP ²	[kBq U235 eq.]	4.00E-01	9.55E-03	-2.00E-03	0.00E+00	2.90E-05	3.56E-04	0.00E+00	3.00E-03	0.00E+00
ETP-fw ¹	[CTUe]	3.53E+01	2.62E+01	3.03E-02	0.00E+00	7.95E-02	9.77E-01	0.00E+00	1.46E+00	0.00E+00
HTP-c ¹	[CTUh]	1.15E-09	5.41E-10	1.71E-13	0.00E+00	1.64E-12	2.02E-11	0.00E+00	2.17E-10	0.00E+00
HTP-nc ¹	[CTUh]	7.64E-08	2.74E-08	4.55E-11	0.00E+00	9.62E-11	1.02E-09	0.00E+00	2.39E-08	0.00E+00
SQP ¹	-	3.21E+01	1.23E+01	-1.02E-01	0.00E+00	3.73E-02	4.58E-01	0.00E+00	5.33E-01	0.00E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									
	² 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.									

RESOURCE USE PER m ² CEMBRIT WINDSTOPPER BASIC										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PERE	[MJ]	1.03E+01	2.02E+00	-5.30E-02	0.00E+00	6.14E-03	7.55E-02	0.00E+00	3.35E-01	0.00E+00
PERM	[MJ]	5.93E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.03E+01	2.02E+00	-5.30E-02	0.00E+00	6.14E-03	7.55E-02	0.00E+00	3.35E-01	0.00E+00
PENRE	[MJ]	5.24E+01	3.51E+01	-3.97E-02	0.00E+00	1.07E-01	1.31E+00	0.00E+00	2.56E+00	0.00E+00
PENRM	[MJ]	3.15E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	5.24E+01	3.51E+01	-3.97E-02	0.00E+00	1.07E-01	1.31E+00	0.00E+00	2.56E+00	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m ³]	2.14E-02	2.36E-03	5.83E-06	0.00E+00	7.16E-06	8.80E-05	0.00E+00	6.45E-04	0.00E+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 = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER m ² CEMBRIT WINDSTOPPER BASIC										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
HWD	[kg]	1.46E-07	1.62E-06	4.85E-09	0.00E+00	4.93E-09	6.06E-08	0.00E+00	3.90E-08	0.00E+00
NHWD	[kg]	7.45E-01	5.57E-03	2.13E-03	0.00E+00	1.69E-05	2.08E-04	0.00E+00	1.29E+01	0.00E+00
RWD	[kg]	3.25E-03	6.48E-05	-1.20E-05	0.00E+00	1.97E-07	2.42E-06	0.00E+00	2.91E-05	0.00E+00

CRU	[kg]	0.00E+00								
MFR	[kg]	0.00E+00								
MER	[kg]	2.50E-01	0.00E+00	9.33E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00								
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; EE = Exported energy									

BIOGENIC CARBON CONTENT PER DECLARED UNIT (1 m ²)		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0.2
Biogenic carbon content in accompanying packaging	kg C	0.2

Cembrit Construction

The declared unit is for 1 m² of Cembrit Construction with a thickness of 9 mm. A conversion factor 0.667, 0.889 and 1.11 must be applied, when calculating results LCIA results for Cembrit Construction with a respective thickness of 6, 8 and 10 mm.

ENVIRONMENTAL IMPACTS PER m ² CEMBRIT CONSTRUCTION										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	1.17E+01	2.90E+00	2.71E-02	0.00E+00	9.89E-03	1.22E-01	0.00E+00	2.23E-01	0.00E+00
GWP-fossil	[kg CO ₂ eq.]	1.21E+01	2.72E+00	2.73E-02	0.00E+00	1.03E-02	1.20E-01	0.00E+00	2.41E-01	0.00E+00
GWP-biogenic	[kg CO ₂ eq.]	-3.43E-01	1.83E-01	-3.40E-04	0.00E+00	-4.51E-04	1.30E-03	0.00E+00	-1.91E-02	0.00E+00
GWP-luluc	[kg CO ₂ eq.]	1.41E-02	4.01E-07	6.22E-05	0.00E+00	7.97E-05	9.80E-04	0.00E+00	6.94E-04	0.00E+00
ODP	[kg CFC 11 eq.]	4.85E-08	9.08E-21	-1.28E-16	0.00E+00	1.81E-18	2.22E-17	0.00E+00	8.94E-16	0.00E+00
AP	[mol H ⁺ eq.]	2.70E-02	1.10E-03	2.35E-05	0.00E+00	5.03E-05	1.40E-04	0.00E+00	1.73E-03	0.00E+00
EP-freshwater	[kg PO ₄ eq.]	2.27E-04	1.51E-10	-2.19E-08	0.00E+00	3.00E-08	3.69E-07	0.00E+00	4.14E-07	0.00E+00
EP-marine	[kg N eq.]	8.31E-03	5.51E-04	1.61E-05	0.00E+00	2.33E-05	4.30E-05	0.00E+00	4.45E-04	0.00E+00
EP-terrestrial	[mol N eq.]	8.90E-02	6.15E-03	1.96E-04	0.00E+00	2.58E-04	5.10E-04	0.00E+00	4.89E-03	0.00E+00
POCP	[kg NMVOC eq.]	2.28E-02	1.12E-03	4.60E-05	0.00E+00	6.52E-05	1.16E-04	0.00E+00	1.35E-03	0.00E+00
ADPm ¹	[kg Sb eq.]	4.34E-05	4.00E-12	-1.36E-09	0.00E+00	7.96E-10	9.79E-09	0.00E+00	2.17E-08	0.00E+00
ADPf ¹	[MJ]	1.07E+02	6.60E-04	-7.25E-02	0.00E+00	1.31E-01	1.62E+00	0.00E+00	3.16E+00	0.00E+00
WDP ¹	[m ³]	1.33E+00	4.83E-07	1.19E-03	0.00E+00	9.60E-05	1.18E-03	0.00E+00	2.53E-02	0.00E+00
Caption	GWP-total = Global Warming Potential - total; 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 = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER m ² CEMBRIT CONSTRUCTION										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PM	[Disease incidence]	3.52E-07	4.75E-09	3.74E-10	0.00E+00	5.66E-10	9.28E-10	0.00E+00	2.14E-08	0.00E+00
IRP ²	[kBq U235 eq.]	6.71E-01	1.80E-07	-2.80E-03	0.00E+00	3.59E-05	4.41E-04	0.00E+00	3.71E-03	0.00E+00
ETP-fw ¹	[CTUe]	6.33E+01	2.39E-03	2.98E-02	0.00E+00	9.83E-02	1.21E+00	0.00E+00	1.81E+00	0.00E+00
HTP-c ¹	[CTUh]	2.41E-09	3.64E-13	-1.84E-14	0.00E+00	2.03E-12	2.50E-11	0.00E+00	2.68E-10	0.00E+00
HTP-nc ¹	[CTUh]	2.07E-07	4.78E-10	4.84E-11	0.00E+00	1.19E-10	1.27E-09	0.00E+00	2.95E-08	0.00E+00
SQP ¹	-	7.46E+01	2.32E-04	-1.48E-01	0.00E+00	4.61E-02	5.67E-01	0.00E+00	6.60E-01	0.00E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									
	² 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.									

RESOURCE USE PER m ² CEMBRIT CONSTRUCTION										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PERE	[MJ]	1.98E+01	3.82E-05	-7.48E-02	0.00E+00	7.60E-03	9.34E-02	0.00E+00	4.15E-01	0.00E+00
PERM	[MJ]	7.12E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.98E+01	3.82E-05	-7.48E-02	0.00E+00	7.60E-03	9.34E-02	0.00E+00	4.15E-01	0.00E+00
PENRE	[MJ]	1.07E+02	6.63E-04	-7.20E-02	0.00E+00	1.32E-01	1.62E+00	0.00E+00	3.17E+00	0.00E+00
PENRM	[MJ]	9.86E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.07E+02	6.63E-04	-7.20E-02	0.00E+00	1.32E-01	1.62E+00	0.00E+00	3.17E+00	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m ³]	5.53E-02	4.45E-08	7.01E-06	0.00E+00	8.85E-06	1.09E-04	0.00E+00	7.98E-04	0.00E+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 = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER m ² CEMBRIT CONSTRUCTION										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
HWD	[kg]	7.99E-08	3.07E-11	5.98E-09	0.00E+00	6.10E-09	7.50E-08	0.00E+00	4.83E-08	0.00E+00
NHWD	[kg]	8.90E-01	1.05E-07	2.96E-03	0.00E+00	2.09E-05	2.57E-04	0.00E+00	1.59E+01	0.00E+00
RWD	[kg]	5.12E-03	1.22E-09	-1.68E-05	0.00E+00	2.43E-07	2.99E-06	0.00E+00	3.60E-05	0.00E+00

CRU	[kg]	0.00E+00								
MFR	[kg]	0.00E+00								
MER	[kg]	2.80E-01	0.00E+00	1.30E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00								
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; EE = Exported energy									

BIOGENIC CARBON CONTENT PER DECLARED UNIT (1 m ²)		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	1.1
Biogenic carbon content in accompanying packaging	kg C	0.2

Cembrit Construction (Anthracite)

The declared unit is for 1 m² of Cembrit Construction (Anthracite) with a thickness of 9 mm. A conversion factor 0.889 must be applied, when calculating results LCIA results for Cembrit Construction (Anthracite) with a thickness of 8 mm.

ENVIRONMENTAL IMPACTS PER m ² CEMBRIT CONSTRUCTION (ANTHRACITE)										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	1.17E+01	3.31E+00	2.72E-02	0.00E+00	1,00E-02	1,23E-01	0.00E+00	2,26E-01	0.00E+00
GWP-fossil	[kg CO ₂ eq.]	1.21E+01	3.25E+00	2.75E-02	0.00E+00	1,04E-02	1,21E-01	0.00E+00	2,44E-01	0.00E+00
GWP-biogenic	[kg CO ₂ eq.]	-3.42E-01	3.54E-02	-3.45E-04	0.00E+00	-4,56E-04	1,32E-03	0.00E+00	-1,94E-02	0.00E+00
GWP-luluc	[kg CO ₂ eq.]	1.41E-02	2.67E-02	6.33E-05	0.00E+00	8,07E-05	9,92E-04	0.00E+00	7,03E-04	0.00E+00
ODP	[kg CFC 11 eq.]	4.96E-08	6.05E-16	-1.28E-16	0.00E+00	1,83E-18	2,25E-17	0.00E+00	9,06E-16	0.00E+00
AP	[mol H ⁺ eq.]	2.71E-02	3.67E-03	2.42E-05	0.00E+00	5,09E-05	1,42E-04	0.00E+00	1,75E-03	0.00E+00
EP-freshwater	[kg PO ₄ eq.]	2.36E-04	1.00E-05	-2.15E-08	0.00E+00	3,04E-08	3,73E-07	0.00E+00	4,19E-07	0.00E+00
EP-marine	[kg N eq.]	8.36E-03	1.10E-03	1.64E-05	0.00E+00	2,36E-05	4,35E-05	0.00E+00	4,51E-04	0.00E+00
EP-terrestrial	[mol N eq.]	8.95E-02	1.31E-02	1.99E-04	0.00E+00	2,61E-04	5,17E-04	0.00E+00	4,95E-03	0.00E+00
POCP	[kg NMVOC eq.]	2.30E-02	3.02E-03	4.68E-05	0.00E+00	6,60E-05	1,17E-04	0.00E+00	1,37E-03	0.00E+00
ADPm ¹	[kg Sb eq.]	4.35E-05	2.66E-07	-1.35E-09	0.00E+00	8,06E-10	9,91E-09	0.00E+00	2,19E-08	0.00E+00
ADPf ¹	[MJ]	1.07E+02	4.40E+01	-7.08E-02	0.00E+00	1,33E-01	1,64E+00	0.00E+00	3,20E+00	0.00E+00
WDP ¹	[m ³]	1.79E+00	3.21E-02	1.19E-03	0.00E+00	9,72E-05	1,20E-03	0.00E+00	2,56E-02	0.00E+00
Caption	GWP-total = Global Warming Potential - total; 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 = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER m ² CEMBRIT CONSTRUCTION (ANTHRACITE)										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PM	[Disease incidence]	3.52E-07	2.49E-08	3.81E-10	0.00E+00	5.73E-10	9.39E-10	0.00E+00	2.17E-08	0.00E+00
IRP ²	[kBq U235 eq.]	6.75E-01	1.20E-02	-2.79E-03	0.00E+00	3.63E-05	4.47E-04	0.00E+00	3.75E-03	0.00E+00
ETP-fw ¹	[CTUe]	6.73E+01	3.29E+01	3.10E-02	0.00E+00	9.96E-02	1.22E+00	0.00E+00	1.83E+00	0.00E+00
HTP-c ¹	[CTUh]	2.41E-09	6.80E-10	7.13E-15	0.00E+00	2.06E-12	2.53E-11	0.00E+00	2.71E-10	0.00E+00
HTP-nc ¹	[CTUh]	2.07E-07	3.44E-08	4.99E-11	0.00E+00	1.21E-10	1.28E-09	0.00E+00	2.99E-08	0.00E+00
SQP ¹	-	7.47E+01	1.54E+01	-1.47E-01	0.00E+00	4.67E-02	5.74E-01	0.00E+00	6.68E-01	0.00E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									
	² 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.									

RESOURCE USE PER m ² CEMBRIT CONSTRUCTION (ANTHRACITE)										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PERE	[MJ]	1.99E+01	2.54E+00	-7.47E-02	0.00E+00	7.69E-03	9.46E-02	0.00E+00	4.20E-01	0.00E+00
PERM	[MJ]	7.12E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.99E+01	2.54E+00	-7.47E-02	0.00E+00	7.69E-03	9.46E-02	0.00E+00	4.20E-01	0.00E+00
PENRE	[MJ]	1.07E+02	4.41E+01	-7.03E-02	0.00E+00	1.34E-01	1.64E+00	0.00E+00	3.21E+00	0.00E+00
PENRM	[MJ]	9.90E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.07E+02	4.41E+01	-7.03E-02	0.00E+00	1.34E-01	1.64E+00	0.00E+00	3.21E+00	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m ³]	6.61E-02	2.96E-03	7.12E-06	0.00E+00	8.97E-06	1.10E-04	0.00E+00	8.08E-04	0.00E+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 = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER m ² CEMBRIT CONSTRUCTION (ANTHRACITE)										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
HWD	[kg]	8.02E-08	2.04E-06	6.06E-09	0.00E+00	6.18E-09	7.59E-08	0.00E+00	4.89E-08	0.00E+00
NHWD	[kg]	8.94E-01	6.99E-03	2.96E-03	0.00E+00	2.12E-05	2.60E-04	0.00E+00	1.61E+01	0.00E+00
RWD	[kg]	5.12E-03	8.13E-05	-1.68E-05	0.00E+00	2.46E-07	3.03E-06	0.00E+00	3.65E-05	0.00E+00

CRU	[kg]	0.00E+00								
MFR	[kg]	0.00E+00								
MER	[kg]	2.80E-01	0.00E+00	1.30E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00								
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; EE = Exported energy									

BIOGENIC CARBON CONTENT PER DECLARED UNIT (1 m ²)		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	1.1
Biogenic carbon content in accompanying packaging	kg C	0.2

Cembrit Multi Force

ENVIRONMENTAL IMPACTS PER m ² CEMBRIT MULTI FORCE										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	6.90E+00	1.93E+00	1.64E-02	0.00E+00	5.85E-03	7.20E-02	0.00E+00	1.32E-01	0.00E+00
GWP-fossil	[kg CO ₂ eq.]	7.01E+00	1.89E+00	1.66E-02	0.00E+00	6.06E-03	7.07E-02	0.00E+00	1.43E-01	0.00E+00
GWP-biogenic	[kg CO ₂ eq.]	-1.07E-01	2.06E-02	-1.98E-04	0.00E+00	-2.66E-04	7.69E-04	0.00E+00	-1.13E-02	0.00E+00
GWP-luluc	[kg CO ₂ eq.]	4.14E-03	1.55E-02	3.64E-05	0.00E+00	4.71E-05	5.79E-04	0.00E+00	4.10E-04	0.00E+00
ODP	[kg CFC 11 eq.]	3.86E-08	3.52E-16	-7.88E-17	0.00E+00	1.07E-18	1.31E-17	0.00E+00	5.29E-16	0.00E+00
AP	[mol H ⁺ eq.]	1.51E-02	2.14E-03	1.33E-05	0.00E+00	2.97E-05	8.27E-05	0.00E+00	1.02E-03	0.00E+00
EP-freshwater	[kg PO ₄ eq.]	1.54E-04	5.84E-06	-1.42E-08	0.00E+00	1.77E-08	2.18E-07	0.00E+00	2.45E-07	0.00E+00
EP-marine	[kg N eq.]	4.46E-03	6.41E-04	9.37E-06	0.00E+00	1.38E-05	2.54E-05	0.00E+00	2.63E-04	0.00E+00
EP-terrestrial	[mol N eq.]	4.83E-02	7.64E-03	1.15E-04	0.00E+00	1.52E-04	3.02E-04	0.00E+00	2.89E-03	0.00E+00
POCP	[kg NMVOC eq.]	1.30E-02	1.76E-03	2.67E-05	0.00E+00	3.86E-05	6.85E-05	0.00E+00	7.97E-04	0.00E+00
ADPm ¹	[kg Sb eq.]	3.75E-05	1.55E-07	-8.58E-10	0.00E+00	4.71E-10	5.79E-09	0.00E+00	1.28E-08	0.00E+00
ADPf ¹	[MJ]	6.10E+01	2.56E+01	-4.78E-02	0.00E+00	7.77E-02	9.55E-01	0.00E+00	1.87E+00	0.00E+00
WDP ¹	[m ³]	5.26E-01	1.87E-02	7.30E-04	0.00E+00	5.68E-05	6.98E-04	0.00E+00	1.49E-02	0.00E+00
Caption	GWP-total = Global Warming Potential - total; 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 = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER m ² CEMBRIT MULTI FORCE										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PM	[Disease incidence]	1.86E-07	1.45E-08	2.16E-10	0.00E+00	3.35E-10	5.48E-10	0.00E+00	1.27E-08	0.00E+00
IRP ²	[kBq U235 eq.]	4.65E-01	6.99E-03	-1.72E-03	0.00E+00	2.12E-05	2.61E-04	0.00E+00	2.19E-03	0.00E+00
ETP-fw ¹	[CTUe]	4.40E+01	1.92E+01	1.60E-02	0.00E+00	5.81E-02	7.15E-01	0.00E+00	1.07E+00	0.00E+00
HTP-c ¹	[CTUh]	1.36E-09	3.96E-10	-6.05E-14	0.00E+00	1.20E-12	1.48E-11	0.00E+00	1.58E-10	0.00E+00
HTP-nc ¹	[CTUh]	8.74E-08	2.01E-08	2.69E-11	0.00E+00	7.04E-11	7.49E-10	0.00E+00	1.74E-08	0.00E+00
SQP ¹	-	3.56E+01	8.99E+00	-9.19E-02	0.00E+00	2.73E-02	3.35E-01	0.00E+00	3.90E-01	0.00E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									
	² 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.									

RESOURCE USE PER m ² CEMBRIT MULTI FORCE										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PERE	[MJ]	1.15E+01	1.48E+00	-4.62E-02	0.00E+00	4.49E-03	5.52E-02	0.00E+00	2.45E-01	0.00E+00
PERM	[MJ]	6.48E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.15E+01	1.48E+00	-4.62E-02	0.00E+00	4.49E-03	5.52E-02	0.00E+00	2.45E-01	0.00E+00
PENRE	[MJ]	6.10E+01	2.57E+01	-4.75E-02	0.00E+00	7.80E-02	9.59E-01	0.00E+00	1.87E+00	0.00E+00
PENRM	[MJ]	6.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	6.10E+01	2.57E+01	-4.75E-02	0.00E+00	7.80E-02	9.59E-01	0.00E+00	1.87E+00	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m ³]	2.28E-02	1.73E-03	4.10E-06	0.00E+00	5.23E-06	6.43E-05	0.00E+00	4.72E-04	0.00E+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 = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER m ² MULTI FORCE										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
HWD	[kg]	1.75E-07	1.19E-06	3.53E-09	0.00E+00	3.61E-09	4.43E-08	0.00E+00	2.85E-08	0.00E+00
NHWD	[kg]	7.90E-01	4.07E-03	1.82E-03	0.00E+00	1.24E-05	1.52E-04	0.00E+00	9.41E+00	0.00E+00
RWD	[kg]	3.79E-03	4.74E-05	-1.04E-05	0.00E+00	1.44E-07	1.77E-06	0.00E+00	2.13E-05	0.00E+00

CRU	[kg]	0.00E+00								
MFR	[kg]	0.00E+00								
MER	[kg]	2.50E-01	0.00E+00	8.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00								
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; EE = Exported energy									

BIOGENIC CARBON CONTENT PER DECLARED UNIT (1 m ²)		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0.3
Biogenic carbon content in accompanying packaging	kg C	0.2

Additional information

Technical information on scenarios

Transport to the building site (A4)

Scenario information	Value	Unit
Fuel type and consumption	0.5-0.913	L diesel
Transport distance	3,300	km
Capacity utilisation (including empty runs)	80	%
Gross density of products transported	9.4 – 16.2	kg/m ²
Capacity utilisation volume factor	0.55	-

Installation of the product in the building (A5)

Scenario information	Value	Unit
Ancillary materials	0	kg
Water use	0	m ³
Other resource use	0	kg
Fuel consumption	0.002 – 0.003	kg
Waste materials	0.038 – 0.053	kg
Output materials	0	kg
Direct emissions to air, soil or water	0	kg

Reference service life

RSL information	Unit
Reference service Life	30 Years

Use (B1-B7)

Modules not relevant

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	0	kg
Collected with mixed waste	0	kg
For reuse	0	kg
For recycling	0	kg
For energy recovery	0	kg
For final disposal	9.4 – 16.2	kg

Indoor air

Cembrit has performed an emission classification of Building materials – M1, for the indoor products. The certification is voluntary and refers to indoor air quality standards for materials used in regular work and residential facilities. The certification test covers emission measurements of volatile organic compounds (VOC, TVOC, CMR), ammonia and formaldehyde. The classification enhances the development and use of low-emitting building materials.

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 harmonized test methods according to the provisions of the respective technical committees for European product standards are not available.

References

Publisher	 epddanmark www.epddanmark.dk
Programme operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Julie Rønholt and Maria Magnea Steingrimsdottir COWI A/S www.cowi.com
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General programme instructions

Version 2.0

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EN 15804

DS/EN 15804:2012 + A2:2019 - "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"