

Owner: Skamol  
No.: MD-22055-EN  
Issued: 10-02-2023  
Valid to: 10-02-2028

3<sup>rd</sup> PARTY VERIFIED

**EPD**

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804



**Owner of declaration**

Skamol  
Hasselager Centervej 1, 8260 Viby  
Denmark  
41333715


**Issued:**

10-02-2023

**Valid to:**

10-02-2028

**Programme**

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



- Industry EPD  
 Product EPD

**Basis of calculation**

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

**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.

**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.

**Declared product(s)**

Calcium silicate boards with 4 different densities: 225, 245, 250 and 300 kg/m<sup>3</sup>. The thickness range is 25-100 mm.

**Number of declared datasets/product variations:**

<b>Products with the density of 225 kg/m<sup>3</sup></b> SkamoAlu S-Isol, SkamoAlu S-Isol WR (with coating) SkamoCeramic S-Isol, SkamoCeramic S-Isol (with coating) SkamoDoor Board 225, SkamoEnclosure Board SkamoSteel S-Isol, SkamoSteel S-Isol WR (with coating) SkamoWall Board, SkamoWall Bore, SkamoWall Wedge
<b>Products with the density of 245 kg/m<sup>3</sup></b> SkamoAlu S-1100E, SkamoAlu S-1100E WR (with coating) SkamoCeramic S-1100E, SkamoCeramic S-1100E (with coating) SkamoSteel S-1100E, SkamoSteel S-1100E WR (with coating)
<b>Products with the density of 250 kg/m<sup>3</sup></b> SkamoCovering Board 250 SkamoDoor Board 250 SkamoMarinePanel Board 250 SkamoStructure Board 250 SkamoTunnel Board 250
<b>Products with the density of 300 kg/m<sup>3</sup></b> SkamoCovering Board 300 SkamoDoor Board 300 SkamoDoor Frame 300, SkamoMarinePanel Board 300

**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 serves as the core PCR

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

- internal  external

Third party verifier:



Ninkie Bendtsen

**Production sites**

Skamol Branden, Fur Landevej 118, 7870 Roslev, Denmark  
 Skamol Opole, Ul, Północna 18A, 45-805 Opole, Poland

**Product(s) use**

The calcium silicate boards' primary function is thermal insulation of walls, roofs, and ceilings/floors (indoors).

The calcium silicate boards are used to:

- improve the indoor climate in buildings
- provide passive fire protection
- reduce energy consumption in industrial applications

**Declared/Functional unit**

1 m<sup>2</sup> of calcium silicate boards with a 25 mm thickness

**Year of production site data (A3):** 2020

**EPD version:** 1st version, 17.10.2022



Martha Katrine Sørensen  
EPD Danmark

Life cycle stages and modules (MNR = 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>	<b>X</b>	<b>X</b>	MND	MND	MND	MND	MND	MND	MND	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

# Product information

## Product description

The main product components are shown in the table below.

Material	Weight-% of declared product
Micro silica	35-43
Quick lime	32-39
Crushed material	13-16
Organic fiber	3-4
Wollastonite	0-18

## Product packaging:

The composition of the sales- and transport packaging of the product is shown in the table below.

Material	Weight-% of packaging
Wood pallet	83-91
Packaging film	4-15
Cardboard	1-6

## Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of calcium silicate boards on the production sites located in Branden, Denmark and Opole, Poland. Product specific data are based on average values collected in the period 2020. Background data are based on GaBi Professional 2021 and Ecoinvent v3.6 and are less than 8 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

## Hazardous substances

The products do not contain substances listed on the "Candidate List of Substances of Very High Concern for authorization"

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

## Essential characteristics

Calcium silicate boards improve the indoor climate in buildings, provide passive fire protection and reduce energy consumption in industrial applications.

Parameter	Value	Unit
Reaction to fire	A1-A2-s1,d0	Class
Maximum service temperature	≥ 900	°C
Density	225 to 300	Kg/m <sup>3</sup>
Compressive strength	≥ 1.5	MPa
Thermal conductivity for 225 kg/m <sup>3</sup> (λ <sub>23,50</sub> )	0.068	W/(m×K)

Further technical information can be obtained by contacting the manufacturer or on the manufacturers website: [www.skamol.com](http://www.skamol.com)

## Reference Service Life (RSL)

50 years.

The RSL is documented and used for the products' CE marking.

## Picture of product(s)



# LCA background

## Declared unit

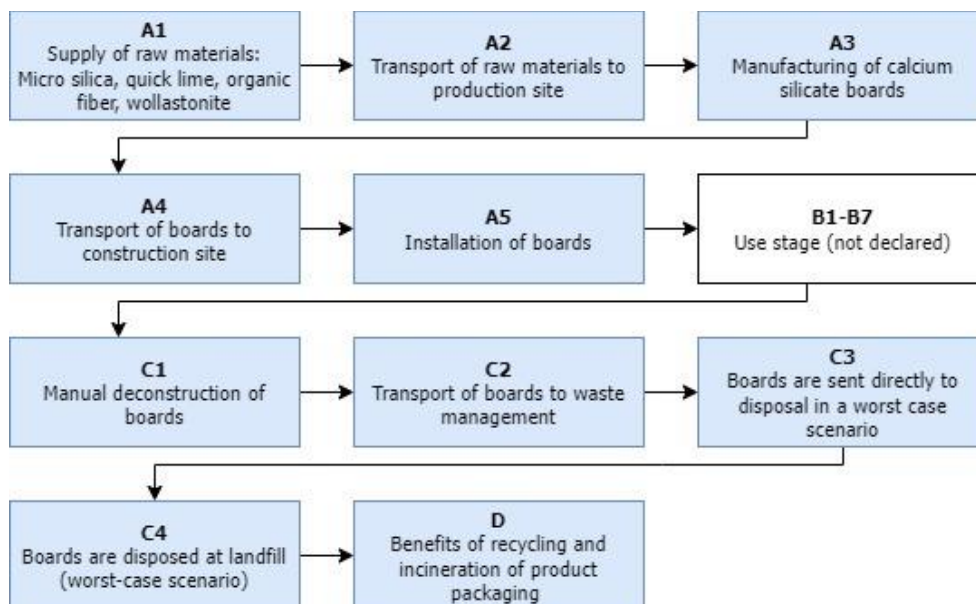
The LCI and LCIA results in this EPD relate to 1 m<sup>2</sup> calcium silicate board with a thickness of 25 mm.

Name	Value	Unit	Conversion factor to 1 kg
Declared unit	1	m <sup>2</sup>	
Density	225	kg/m <sup>3</sup>	0.178
Density	245	kg/m <sup>3</sup>	0.163
Density	250	kg/m <sup>3</sup>	0.160
Density	300	kg/m <sup>3</sup>	0.133

The conversion factors in the table below can be used to calculate the LCA results for calcium silicate boards with a different thickness than 25 mm.

Thick-ness	Conversion factor			
	Density 225 kg/m <sup>3</sup>	Density 245 kg/m <sup>3</sup>	Density 250 kg/m <sup>3</sup>	Density 300 kg/m <sup>3</sup>
20 mm	0.8	0.8	0.8	0.8
25 mm	1.0	1.0	1.0	1.0
30 mm	1.2	1.2	1.2	1.2
40 mm	1.6	1.6	1.6	1.6
50 mm	2.0	2.0	2.0	2.0
60 mm	2.4	2.4	2.4	2.4
75 mm	3.0	3.0	3.0	3.0
100mm	4.0	4.0	4.0	4.0
105mm	4.2	4.2	4.2	4.2

## Flowdiagram



## PCR

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

## Guarantee of Origin – certificates

Foreground system:

The product is produced using electricity grid mix for Denmark and Poland. The electricity used for installation is modelled with the European grid mix. No guarantees of origin (GO) are applied.

Background system:

Upstream and downstream processes are modelled using electricity grid mix.

### System boundary

This EPD is based on a cradle-to-gate LCA with options and 100 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.

The raw materials are mixed with water, when pressed, autoclaved, and dried. The boards with a density of 225 kg/m<sup>3</sup> and 245 kg/m<sup>3</sup> can be coated. Lastly, the boards are cut and packaged.

### Construction process stage (A4-A5) includes:

The boards are transported to the construction site by truck. Based on data from 2020 and 2021, a weighted average transport has been used in the LCA-model, covering 32 countries in Europe, which Skamol delivered its calcium silicate products to. The applied distance is seen under ‘additional information’.

When needed, the boards are installed using plaster and adhesive, mixing them with an electric paddle mixer.

### End of Life (C1-C4) includes:

The product is removed using non-electric tools, e.g., a hammer. The product is crushed and mixed with other construction materials. It is assumed that the product is disposed of at a landfill.

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

Based on data from Eurostat<sup>1</sup>, 65% of the cardboard and packaging foil is recycled, while the remaining 35% is incinerated. The wood pallet is according to the PEF method reusable 25 times, thus, 1/25 of the pallet is modelled for incineration.

The recycling of packaging materials substitute primary materials used to produce cardboard and packaging foil.

The incineration of packaging generates heat and electricity, assumed to be used in the European electricity grid mix and district heating system.

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<sup>1</sup> [Packaging waste statistics - Statistics Explained \(europa.eu\)](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&plugin=1)

# LCA results

## Calcium silicate boards: 225 m<sup>3</sup>/kg

ENVIRONMENTAL IMPACTS PER 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 225 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> eq.]	1.41E+01	4.91E-01	8.56E-02	0.00E+00	2.95E-02	0.00E+00	8.12E-02	-1.24E-02
GWP-fossil	[kg CO <sub>2</sub> eq.]	1.35E+01	4.92E-01	8.17E-02	0.00E+00	2.96E-02	0.00E+00	8.36E-02	-1.28E-02
GWP-biogenic	[kg CO <sub>2</sub> eq.]	6.24E-01	-4.81E-03	3.90E-03	0.00E+00	-2.89E-04	0.00E+00	-2.48E-03	3.96E-04
GWP-luluc	[kg CO <sub>2</sub> eq.]	3.13E-03	3.31E-03	1.82E-05	0.00E+00	1.99E-04	0.00E+00	1.54E-04	-5.70E-06
ODP	[kg CFC 11 eq.]	4.44E-08	4.83E-14	5.34E-12	0.00E+00	2.91E-15	0.00E+00	1.96E-13	-3.28E-11
AP	[mol H <sup>+</sup> eq.]	1.47E-02	1.60E-03	1.74E-04	0.00E+00	9.62E-05	0.00E+00	5.92E-04	-2.11E-05
EP-freshwater	[kg P eq.]	1.29E-04	1.76E-06	2.27E-07	0.00E+00	1.06E-07	0.00E+00	1.42E-07	-2.34E-07
EP-marine	[kg N eq.]	4.95E-03	7.28E-04	3.95E-05	0.00E+00	4.38E-05	0.00E+00	1.51E-04	-6.13E-06
EP-terrestrial	[mol N eq.]	5.24E-02	8.16E-03	4.16E-04	0.00E+00	4.91E-04	0.00E+00	1.66E-03	-6.28E-05
POCP	[kg NMVOC eq.]	1.49E-02	1.43E-03	1.06E-04	0.00E+00	8.63E-05	0.00E+00	4.60E-04	-1.86E-05
ADPm <sup>1</sup>	[kg Sb eq.]	1.28E-05	4.96E-08	2.11E-08	0.00E+00	2.98E-09	0.00E+00	8.57E-09	-6.07E-09
ADPf <sup>1</sup>	[MJ]	1.72E+02	6.45E+00	1.41E+00	0.00E+00	3.88E-01	0.00E+00	1.09E+00	-4.34E-01
WDP <sup>1</sup>	[m <sup>3</sup> world eq. deprived]	1.52E+00	5.50E-03	1.85E-02	0.00E+00	3.31E-04	0.00E+00	9.16E-03	-1.28E-03
Caption	GWP-total = Globale 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 Depletion Potential								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								
Disclaimer	<sup>1</sup> 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 PER 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 225 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease incidence]	1.15E-07	9.30E-09	1.43E-09	0.00E+00	5.59E-10	0.00E+00	7.29E-09	-1.95E-10
IRP <sup>2</sup>	[kBq U235 eq.]	4.62E-01	1.82E-03	3.81E-02	0.00E+00	1.09E-04	0.00E+00	1.36E-03	-8.26E-04
ETP-fw <sup>1</sup>	[CTUe]	3.99E+01	4.57E+00	6.19E-01	0.00E+00	2.75E-01	0.00E+00	6.13E-01	-2.35E-01
HTP-c <sup>1</sup>	[CTUh]	9.47E-09	9.43E-11	1.78E-11	0.00E+00	5.67E-12	0.00E+00	9.36E-11	-5.30E-12
HTP-nc <sup>1</sup>	[CTUh]	7.24E-08	5.79E-09	6.65E-10	0.00E+00	3.49E-10	0.00E+00	1.04E-08	-2.47E-10
SQP <sup>1</sup>	-	1.94E+01	2.73E+00	5.09E-01	0.00E+00	1.64E-01	0.00E+00	2.28E-01	-1.35E-01
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)								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								
Disclaimers	<sup>1</sup> 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.								
	<sup>2</sup> 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 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 225 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	1.44E+01	4.47E-01	7.81E-01	0.00E+00	2.69E-02	0.00E+00	1.64E-01	-6.17E-02
PERM	[MJ]	3.93E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.83E+01	4.47E-01	7.81E-01	0.00E+00	2.69E-02	0.00E+00	1.64E-01	-6.17E-02
PENRE	[MJ]	1.72E+02	6.48E+00	1.41E+00	0.00E+00	3.90E-01	0.00E+00	1.10E+00	-4.34E-01
PENRM	[MJ]	3.81E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.72E+02	6.48E+00	1.41E+00	0.00E+00	3.90E-01	0.00E+00	1.10E+00	-4.34E-01
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
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
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
FW	[m <sup>3</sup> ]	5.22E-02	5.17E-04	7.64E-04	0.00E+00	3.11E-05	0.00E+00	2.78E-04	-7.77E-05
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								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 225 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	6.17E-04	3.43E-11	1.22E-10	0.00E+00	2.06E-12	0.00E+00	5.63E-11	-4.24E-11
NHWD	[kg]	5.85E-01	1.06E-03	1.59E-03	0.00E+00	6.35E-05	0.00E+00	5.61E+00	-1.74E-04
RWD	[kg]	7.91E-04	1.20E-05	2.25E-04	0.00E+00	7.24E-07	0.00E+00	1.22E-05	-5.80E-06
CRU	[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
MFR	[kg]	5.14E-03	0.00E+00	5.31E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[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
EEE	[MJ]	2.23E-03	0.00E+00	8,05E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	4.18E-03	0.00E+00	1,99E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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; EEE = Exported electrical energy; EET = Exported thermal energy								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								



### Calcium silicate boards: 245 m<sup>3</sup>/kg

ENVIRONMENTAL IMPACTS PER 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 245 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> eq.]	1.23E+01	6.37E-01	7.84E-02	0.00E+00	3.22E-02	0.00E+00	8.85E-02	-2.90E-04
GWP-fossil	[kg CO <sub>2</sub> eq.]	1.20E+01	6.39E-01	7.74E-02	0.00E+00	3.23E-02	0.00E+00	9.10E-02	-6.15E-04
GWP-biogenic	[kg CO <sub>2</sub> eq.]	3.28E-01	-6.24E-03	1.01E-03	0.00E+00	-3.15E-04	0.00E+00	-2.70E-03	3.27E-04
GWP-luluc	[kg CO <sub>2</sub> eq.]	2.95E-03	4.30E-03	1.65E-05	0.00E+00	2.17E-04	0.00E+00	1.68E-04	-2.60E-06
ODP	[kg CFC 11 eq.]	4.42E-08	6.27E-14	1.55E-12	0.00E+00	3.16E-15	0.00E+00	2.14E-13	-2.18E-11
AP	[mol H <sup>+</sup> eq.]	1.13E-02	2.07E-03	1.70E-04	0.00E+00	1.05E-04	0.00E+00	6.45E-04	-2.26E-06
EP-freshwater	[kg P eq.]	1.14E-04	2.28E-06	2.25E-07	0.00E+00	1.15E-07	0.00E+00	1.54E-07	-1.38E-07
EP-marine	[kg N eq.]	3.93E-03	9.44E-04	3.81E-05	0.00E+00	4.77E-05	0.00E+00	1.65E-04	-6.84E-07
EP-terrestrial	[mol N eq.]	4.19E-02	1.06E-02	4.00E-04	0.00E+00	5.35E-04	0.00E+00	1.81E-03	-6.52E-06
POCP	[kg NMVOC eq.]	1.21E-02	1.86E-03	1.03E-04	0.00E+00	9.40E-05	0.00E+00	5.01E-04	-1.76E-06
ADPm <sup>1</sup>	[kg Sb eq.]	1.24E-05	6.43E-08	2.10E-08	0.00E+00	3.25E-09	0.00E+00	9.33E-09	-2.16E-09
ADP <sup>1</sup>	[MJ]	1.55E+02	8.38E+00	1.40E+00	0.00E+00	4.23E-01	0.00E+00	1.19E+00	-1.50E-02
WDP <sup>1</sup>	[m <sup>3</sup> world eq. deprived]	2.60E+00	7.14E-03	1.77E-02	0.00E+00	3.61E-04	0.00E+00	9.98E-03	-5.51E-04
Caption	GWP-total = Globale 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; ADP <sup>1</sup> = Abiotic Depletion Potential - fossil fuels; WDP = Water Depletion Potential								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								
Disclaimer	<sup>1</sup> 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 PER 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 245 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease incidence]	8.48E-08	1.21E-08	1.41E-09	0.00E+00	6.09E-10	0.00E+00	7.94E-09	-4.00E-11
IRP <sup>2</sup>	[kBq U235 eq.]	4.83E-01	2.36E-03	3.79E-02	0.00E+00	1.19E-04	0.00E+00	1.48E-03	-9.60E-05
ETP-fw <sup>1</sup>	[CTUe]	3.59E+01	5.94E+00	6.13E-01	0.00E+00	3.00E-01	0.00E+00	6.68E-01	-2.80E-02
HTP-c <sup>1</sup>	[CTUh]	9.42E-09	1.22E-10	1.76E-11	0.00E+00	6.18E-12	0.00E+00	1.02E-10	-3.12E-13
HTP-nc <sup>1</sup>	[CTUh]	5.02E-08	7.52E-09	6.50E-10	0.00E+00	3.80E-10	0.00E+00	1.13E-08	-1.25E-11
SQP <sup>1</sup>	-	1.98E+01	3.55E+00	5.05E-01	0.00E+00	1.79E-01	0.00E+00	2.48E-01	-5.76E-02
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)								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								
Disclaimers	<sup>1</sup> 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.								
	<sup>2</sup> 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 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 245 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	1.82E+01	5.81E-01	7.77E-01	0.00E+00	2.93E-02	0.00E+00	1.79E-01	-1.14E-02
PERM	[MJ]	3.85E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.21E+01	5.81E-01	7.77E-01	0.00E+00	2.93E-02	0.00E+00	1.79E-01	-1.14E-02
PENRE	[MJ]	1.55E+02	8.41E+00	1.40E+00	0.00E+00	4.25E-01	0.00E+00	1.19E+00	-1.50E-02
PENRM	[MJ]	3.80E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.55E+02	8.41E+00	1.40E+00	0.00E+00	4.25E-01	0.00E+00	1.19E+00	-1.50E-02
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
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
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
FW	[m <sup>3</sup> ]	6.57E-02	6.71E-04	7.43E-04	0.00E+00	3.39E-05	0.00E+00	3.03E-04	-1.45E-05
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								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 245 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	6.21E-04	4.45E-11	1.21E-10	0.00E+00	2.25E-12	0.00E+00	6.13E-11	-1.68E-12
NHWD	[kg]	3.57E-01	1.37E-03	1.08E-03	0.00E+00	6.92E-05	0.00E+00	6.11E+00	-8.51E-06
RWD	[kg]	9.57E-04	1.56E-05	2.24E-04	0.00E+00	7.88E-07	0.00E+00	1.33E-05	-2.85E-07
CRU	[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
MFR	[kg]	4.00E-03	0.00E+00	4.41E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[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
EEE	[MJ]	2.81E-03	0.00E+00	6.06E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	[MJ]	5.27E-03	0.00E+00	1.62E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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; EEE = Exported electrical energy; EET = Exported thermal energy								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								

### Calcium silicate boards: 250 m<sup>3</sup>/kg

ENVIRONMENTAL IMPACTS PER 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 250 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> eq.]	1.27E+01	6.58E-01	7.87E-02	0.00E+00	3.32E-02	0.00E+00	9.14E-02	-3.16E-04
GWP-fossil	[kg CO <sub>2</sub> eq.]	1.24E+01	6.60E-01	7.77E-02	0.00E+00	3.33E-02	0.00E+00	9.40E-02	-5.77E-04
GWP-biogenic	[kg CO <sub>2</sub> eq.]	3.36E-01	-6.44E-03	1.02E-03	0.00E+00	-3.25E-04	0.00E+00	-2.79E-03	2.62E-04
GWP-luluc	[kg CO <sub>2</sub> eq.]	2.96E-03	4.44E-03	1.65E-05	0.00E+00	2.24E-04	0.00E+00	1.74E-04	-2.10E-06
ODP	[kg CFC 11 eq.]	4.85E-08	6.47E-14	1.55E-12	0.00E+00	3.27E-15	0.00E+00	2.21E-13	-1.75E-11
AP	[mol H <sup>+</sup> eq.]	1.17E-02	2.14E-03	1.70E-04	0.00E+00	1.08E-04	0.00E+00	6.67E-04	-1.95E-06
EP-freshwater	[kg P eq.]	1.21E-04	2.35E-06	2.26E-07	0.00E+00	1.19E-07	0.00E+00	1.59E-07	-1.11E-07
EP-marine	[kg N eq.]	4.03E-03	9.75E-04	3.82E-05	0.00E+00	4.93E-05	0.00E+00	1.70E-04	-5.88E-07
EP-terrestrial	[mol N eq.]	4.31E-02	1.09E-02	4.01E-04	0.00E+00	5.52E-04	0.00E+00	1.87E-03	-5.64E-06
POCP	[kg NMVOC eq.]	1.26E-02	1.92E-03	1.03E-04	0.00E+00	9.71E-05	0.00E+00	5.18E-04	-1.53E-06
ADPm <sup>1</sup>	[kg Sb eq.]	1.29E-05	6.64E-08	2.11E-08	0.00E+00	3.35E-09	0.00E+00	9.64E-09	-1.76E-09
ADPp <sup>1</sup>	[MJ]	1.58E+02	8.65E+00	1.41E+00	0.00E+00	4.37E-01	0.00E+00	1.23E+00	-1.44E-02
WDP <sup>1</sup>	[m <sup>3</sup> world eq. deprived]	2.70E+00	7.37E-03	1.77E-02	0.00E+00	3.72E-04	0.00E+00	1.03E-02	-4.48E-04
Caption	GWP-total = Globale 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; ADPp = Abiotic Depletion Potential - fossil fuels; WDP = Water Depletion Potential								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								
Disclaimer	<sup>1</sup> 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 PER 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 250 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease incidence]	8.67E-08	1.25E-08	1.41E-09	0.00E+00	6.29E-10	0.00E+00	8.20E-09	-3.32E-11
IRP <sup>2</sup>	[kBq U235 eq.]	5.22E-01	2.43E-03	3.81E-02	0.00E+00	1.23E-04	0.00E+00	1.52E-03	-8.49E-05
ETP-fw <sup>1</sup>	[CTUe]	3.80E+01	6.13E+00	6.16E-01	0.00E+00	3.10E-01	0.00E+00	6.90E-01	-2.36E-02
HTP-c <sup>1</sup>	[CTUh]	1.04E-08	1.26E-10	1.77E-11	0.00E+00	6.38E-12	0.00E+00	1.05E-10	-2.78E-13
HTP-nc <sup>1</sup>	[CTUh]	5.14E-08	7.76E-09	6.52E-10	0.00E+00	3.92E-10	0.00E+00	1.17E-08	-1.14E-11
SQP <sup>1</sup>	-	1.97E+01	3.66E+00	5.07E-01	0.00E+00	1.85E-01	0.00E+00	2.56E-01	-4.69E-02
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)								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								
Disclaimers	<sup>1</sup> 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.								
	<sup>2</sup> 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 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 250 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	1.81E+01	6.00E-01	7.80E-01	0.00E+00	3.03E-02	0.00E+00	1.85E-01	-9.54E-03
PERM	[MJ]	4.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.21E+01	6.00E-01	7.80E-01	0.00E+00	3.03E-02	0.00E+00	1.85E-01	-9.54E-03
PENRE	[MJ]	1.58E+02	8.68E+00	1.41E+00	0.00E+00	4.39E-01	0.00E+00	1.23E+00	-1.44E-02
PENRM	[MJ]	8.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.58E+02	8.68E+00	1.41E+00	0.00E+00	4.39E-01	0.00E+00	1.23E+00	-1.44E-02
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
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
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
FW	[m <sup>3</sup> ]	6.80E-02	6.93E-04	7.46E-04	0.00E+00	3.50E-05	0.00E+00	3.13E-04	-1.20E-05
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								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 250 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	6.86E-04	4.60E-11	1.22E-10	0.00E+00	2.32E-12	0.00E+00	6.33E-11	-1.60E-12
NHWD	[kg]	3.44E-01	1.41E-03	1.09E-03	0.00E+00	7.15E-05	0.00E+00	6.31E+00	-8.36E-06
RWD	[kg]	8.91E-04	1.61E-05	2.25E-04	0.00E+00	8.14E-07	0.00E+00	1.37E-05	-2.81E-07
CRU	[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
MFR	[kg]	4.00E-03	0.00E+00	4.29E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[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
EEE	[MJ]	2.81E-03	0.00E+00	6.08E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	[MJ]	5.27E-03	0.00E+00	1.63E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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; EEE = Exported electrical energy; EET = Exported thermal energy								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								

### Calcium silicate boards: 300 m<sup>3</sup>/kg

ENVIRONMENTAL IMPACTS PER 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 300 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> eq.]	1.47E+01	5.88E-01	7.88E-02	0.00E+00	3.95E-02	0.00E+00	1.09E-01	-3.73E-04
GWP-fossil	[kg CO <sub>2</sub> eq.]	1.42E+01	5.90E-01	7.77E-02	0.00E+00	3.97E-02	0.00E+00	1.12E-01	-6.99E-04
GWP-biogenic	[kg CO <sub>2</sub> eq.]	4.06E-01	-5.76E-03	1.02E-03	0.00E+00	-3.87E-04	0.00E+00	-3.32E-03	3.28E-04
GWP-luluc	[kg CO <sub>2</sub> eq.]	3.70E-03	3.97E-03	1.66E-05	0.00E+00	2.67E-04	0.00E+00	2.07E-04	-2.62E-06
ODP	[kg CFC 11 eq.]	4.72E-08	5.79E-14	1.55E-12	0.00E+00	3.89E-15	0.00E+00	2.63E-13	-2.19E-11
AP	[mol H <sup>+</sup> eq.]	1.33E-02	1.91E-03	1.70E-04	0.00E+00	1.29E-04	0.00E+00	7.93E-04	-2.39E-06
EP-freshwater	[kg P eq.]	1.25E-04	2.10E-06	2.26E-07	0.00E+00	1.42E-07	0.00E+00	1.90E-07	-1.39E-07
EP-marine	[kg N eq.]	4.70E-03	8.72E-04	3.82E-05	0.00E+00	5.86E-05	0.00E+00	2.03E-04	-7.21E-07
EP-terrestrial	[mol N eq.]	5.02E-02	9.77E-03	4.01E-04	0.00E+00	6.57E-04	0.00E+00	2.23E-03	-6.90E-06
POCP	[kg NMVOC eq.]	1.42E-02	1.72E-03	1.03E-04	0.00E+00	1.16E-04	0.00E+00	6.17E-04	-1.88E-06
ADPm <sup>1</sup>	[kg Sb eq.]	1.40E-05	5.94E-08	2.11E-08	0.00E+00	3.99E-09	0.00E+00	1.15E-08	-2.19E-09
ADPF <sup>1</sup>	[MJ]	1.89E+02	7.73E+00	1.41E+00	0.00E+00	5.20E-01	0.00E+00	1.47E+00	-1.80E-02
WDP <sup>1</sup>	[m <sup>3</sup> world eq. deprived]	3.06E+00	6.59E-03	1.77E-02	0.00E+00	4.43E-04	0.00E+00	1.23E-02	-5.55E-04
Caption	GWP-total = Globale 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 Depletion Potential								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								
Disclaimer	<sup>1</sup> 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 PER 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 300 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease incidence]	1.01E-07	1.11E-08	1.41E-09	0.00E+00	7.49E-10	0.00E+00	9.76E-09	-4.11E-11
IRP <sup>2</sup>	[kBq U235 eq.]	5.39E-01	2.18E-03	3.81E-02	0.00E+00	1.46E-04	0.00E+00	1.82E-03	-1.00E-04
ETP-fw <sup>1</sup>	[CTUe]	3.99E+01	5.48E+00	6.16E-01	0.00E+00	3.69E-01	0.00E+00	8.21E-01	-2.95E-02
HTP-c <sup>1</sup>	[CTUh]	1.01E-08	1.13E-10	1.77E-11	0.00E+00	7.60E-12	0.00E+00	1.25E-10	-3.48E-13
HTP-nc <sup>1</sup>	[CTUh]	5.57E-08	6.94E-09	6.53E-10	0.00E+00	4.67E-10	0.00E+00	1.39E-08	-1.42E-11
SQP <sup>1</sup>	-	2.43E+01	3.27E+00	5.07E-01	0.00E+00	2.20E-01	0.00E+00	3.05E-01	-5.81E-02
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)								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								
Disclaimers	<sup>1</sup> 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.								
	<sup>2</sup> 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 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 300 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	2.37E+01	5.36E-01	7.80E-01	0.00E+00	3.60E-02	0.00E+00	2.20E-01	-1.17E-02
PERM	[MJ]	4.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.77E+01	5.36E-01	7.80E-01	0.00E+00	3.60E-02	0.00E+00	2.20E-01	-1.17E-02
PENRE	[MJ]	1.89E+02	7.76E+00	1.41E+00	0.00E+00	5.22E-01	0.00E+00	1.47E+00	-1.80E-02
PENRM	[MJ]	8.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.89E+02	7.76E+00	1.41E+00	0.00E+00	5.22E-01	0.00E+00	1.47E+00	-1.80E-02
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
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
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
FW	[m <sup>3</sup> ]	7.83E-02	6.19E-04	7.46E-04	0.00E+00	4.16E-05	0.00E+00	3.73E-04	-1.49E-05
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								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 m <sup>2</sup> CALCIUM SILICATE BOARD (DENSITY OF 300 m <sup>3</sup> /kg)									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	6.54E-04	4.11E-11	1.22E-10	0.00E+00	2.76E-12	0.00E+00	7.54E-11	-1.97E-12
NHWD	[kg]	4.77E-01	1.26E-03	1.09E-03	0.00E+00	8.51E-05	0.00E+00	7.51E+00	-9.52E-06
RWD	[kg]	1.30E-03	1.44E-05	2.25E-04	0.00E+00	9.69E-07	0.00E+00	1.63E-05	-3.19E-07
CRU	[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
MFR	[kg]	6.00E-03	0.00E+00	5.47E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[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
EEE	[MJ]	4.21E-03	0.00E+00	6.36E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	[MJ]	7.90E-03	0.00E+00	1.68E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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; EEE = Exported electrical energy; EET = Exported thermal energy								
	The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: 1.95*10 <sup>2</sup> or 195, while 1.12E-11 is the same as 1.12*10 <sup>-11</sup> or 0.0000000000112.								

BIOGENIC CARBON CONTENT PER 1 m <sup>2</sup> of calcium silicate board					
Parameter	Unit	At the factory gate			
		Density: 225 m <sup>3</sup> /kg	Density: 245 m <sup>3</sup> /kg	Density: 250 m <sup>3</sup> /kg	Density: 300 m <sup>3</sup> /kg
Biogenic carbon content in product	[kg C]	Under 5%	Under 5%	Under 5%	Under 5%
Biogenic carbon content in accompanying packaging	[kg C]	0.022	0.002	0.002	0.003
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO <sub>2</sub>				

# Additional information

## LCA interpretation

The majority of the environmental impacts stem from the manufacturing in A3 and the raw materials in A1. Specifically, the source of thermal heat and the raw materials, micro silica, quicklime and organic fibers, account for the maximum contribution to 13 of the 19 impact categories.

## Technical information on scenarios

### Transport to the building site (A4)

Scenario information	Density: 225 kg/m <sup>3</sup>	Density: 245 kg/m <sup>3</sup>	Density: 250 kg/m <sup>3</sup>	Density: 300 kg/m <sup>3</sup>	Unit
Fuel type	Diesel	Diesel	Diesel	Diesel	-
Vehicle type	EURO 5	EURO 5	EURO 5	EURO 5	-
Transport distance	1143	1386	1386	1040	km
Capacity utilisation (including empty runs)	28-32 tons gross weight/22t payload capacity, 0.61 capacity utilisation	28-32 tons gross weight/22t payload capacity, 0.61 capacity utilisation	28-32 tons gross weight/22t payload capacity, 0.61 capacity utilisation	28-32 tons gross weight/22t payload capacity, 0.61 capacity utilisation	-
Gross density of products transported	225	245	250	300	kg/m <sup>3</sup>

### Installation of the product in the building (A5)

Scenario information	Density: 225 kg/m <sup>3</sup>	Density: 245 kg/m <sup>3</sup>	Density: 250 kg/m <sup>3</sup>	Density: 300 kg/m <sup>3</sup>	Unit
Ancillary materials	0	0	0	0	kg
Water use	0	0	0	0	m <sup>3</sup>
Other resource use	0	0	0	0	kg
Energy type and consumption	0.21	0.21	0.21	0.21	kWh
Waste materials (packaging)	0.059	0.005	0.005	0.006	kg
Direct emissions to air, soil or water	0	0	0	0	kg

## Reference service life

RSL information		Unit
Reference service Life	50	years

## End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	0	%
Collected with mixed waste	100	%
For reuse	0	%
For recycling	0	%
For energy recovery	0	%
For final disposal	100	%
Assumptions for scenario development	Worst case scenario: The product is sent to landfill	As appropriate

**Re-use, recovery and recycling potential (D)**

Scenario information/Materiel	Value				Unit
	Board 225	Board 245	Board 250	Board 300	
Packaging material recovered	0,0081	0,00053	0,00049	0,00057	kg
Heat recovered	0,019	0,0016	0,0016	0,0016	MJ
Electricity recovered	0,0081	0,0006	0,0006	0,0006	MJ

**Indoor air**

*The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.1.*

**Soil and water**

*The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.*



# References

<b>Publisher</b>	 <a href="http://www.epddanmark.dk">www.epddanmark.dk</a>
<b>Programme operator</b>	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup <a href="http://www.teknologisk.dk">www.teknologisk.dk</a>
<b>LCA-practitioner</b>	Rikke Zuwa Kempf Bernberg and Freja Jeppesen COWI A/S Parallelsvej 2 2800 Kgs. Lyngby
<b>LCA software / background data</b>	GaBi Professional 2021 and Ecoinvent v3.6
<b>3<sup>rd</sup> party verifier</b>	Ninkie Bendtsen NIRAS A/S Sortemosevej 19 3450 Allerød

### General programme instructions

General Programme Instructions, version 2.0, spring 2020  
[www.epddanmark.dk](http://www.epddanmark.dk)

### EN 15804

DS/EN 15804 + 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"