epddanmark

ECO PLATFORM EPD VERIFIED

Owner:	BYGMA A/S
No.:	MD-26053-EN_rev2
First Issued:	30.04.2026
Revision:	10.08.2026
Valid to:	30.04.2031

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

Owner of declaration
BYGMA A/S
Transformervej 12, 2860 Søborg
CVR: 55930317

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product(s)
SOLID Akustikplade:

- 15 mm unpainted
- 15 mm painted
- 25 mm unpainted
- 25 mm painted
- 35 mm unpainted
- 35 mm painted

The main declared variant is 25 mm, unpainted. Linear scaling factors are introduced for 15 mm and 35 mm in *LCA Background*. A separate dataset for the paint layer is introduced in *Additional Information*.

Production site
Østergade 37-41,
6920 Videbæk
Denmark

Use of Guarantees of Origin
☐ No certificates used
☒ Electricity covered by GoO
☐ Biogas covered by GoO

Declared/ functional unit
1 m^2

Year of production site data (A3)
2024

EPD version
Version 3, 10-08-2026: Hyperlink fixed
Version 2, 27-05-2026: Updated product description and hyperlinks

Issued: 30-04-2026
Valid to: 30-04-2031

Basis of calculation
This EPD is developed and verified 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.

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:

Mirko Miseljic

Martha Katrine Sørensen
EPD Danmark

Life cycle stages and modules (ND = 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

SOLID wood wool cement acoustic panels are robust panels made of cement and wood fibres. The combination of wood and cement creates a strong panel with excellent sound-absorbing properties as well as high resistance to moisture and fire. The panels combine easy installation with effective sound absorption and are developed for spaces where an improved acoustic environment is desired and where durability and a stable indoor climate are required.

Made from wood and cement for high strength and long service life

Moisture-resistant: Withstands humid environments without losing strength or stability

Practical installation

Coverage and weight: 0.72–1.44 m² per panel

Structure (wood fibres): 1–1.5 mm

The wood used in the panels is PEFC-certified. The products are declared at Nordic Ecolabel Gen. 3 and Gen. 4 to be used in Nordic Swan labelled buildings. Compared with conventional ceiling panels, this solution both improves acoustics and contributes to a more pleasant indoor climate.

CE Marked Products

SOLID acoustic panels are CE-marked in accordance with both the European standard for cement-bonded wood wool (EN 13168) and the European standard for suspended ceilings (EN 13964).

The main product components are shown in the table below for a panel as production input. The paint layer is separately displayed to distinguish from painted variants.

Material	Weight of declared product (kg)	Weight-% of declared product
Cement	7,05	41,7
Wood	5,00	29,6
Water (bound)	4,78	28,3
Accelerator	0,08	0,5
Sum	**16,91**	**100**

Material	Weight of declared product (kg)	Weight-% of declared product
Paint	0,39	2,3
Sum	**0,39**	**2,3**

Product packaging:

The product is packaged with LDPE plastic film and cardboard. The packaging material can be easily sorted and treated in dedicated waste recycling channels. The packaged product is delivered on a returnable wood pallet.

The composition of the packaging of the product is shown in the table below.

Material	Weight of packaging material (kg)	Weight-% of packaging
LDPE foil	0,0008	<1
Cardboard	0,048	13
Wood pallet	0,324	87
Sum	**0,373**	**100**

For further information, please find the links in the Reference list.

Representativity

This declaration, including data collection and the modelled foreground system including results, represents the production of SOLID Acoustic panels for ceiling on the production site located in Videbæk, Denmark. Product specific data are based on average values collected for the calendar production year 2024. Background data are based on Ecoinvent v.3.10.1 and are less than 10 years old. Generally, the used background

datasets are of high quality, and the majority of the datasets are only a couple of years old.

The data quality assessment was done according to Table E.2 of the EN 15804+A2 Annex E. The data quality is deemed overall good.

Each of the product variants are declared individually, with multiple end-of-life scenarios, but with a simple average transport distance to Copenhagen, Denmark, where the main warehouse is located.

Hazardous substances

Wood wool panels do not contain any substances listed on the ”Candidate List of Substances of Very High Concern for authorisation”

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

Product(s) use

The panels are applied as ceiling and wall claddings in offices, businesses, schools, institutions, cultural sites, sports centers, swimming pools and private homes etc.

Essential characteristics

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to EN 13168:2012+A1:2015, Thermal insulation products for buildings. Factory made wood wool (WW) products. Specification, and EN 13964:2014, Suspended ceilings. Requirements and test methods.

Further technical information can be obtained by contacting the manufacturer or on the manufacturer’s website:

SOLID Akustikplade

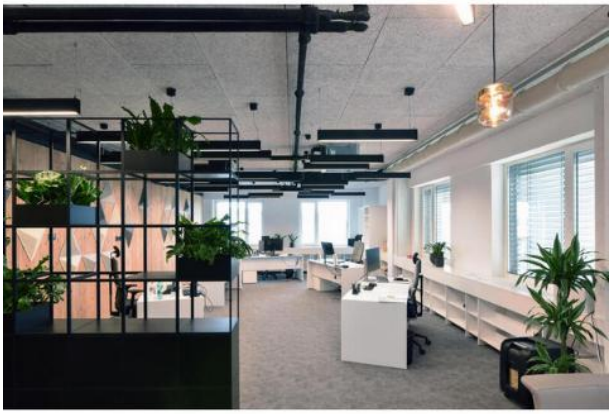
SOLID Akustikplade, Agro

Reference Service Life (RSL)

The technical service life of the panel is 60 years, based on the BUILD lifetime table and categorization as building components group 35 and 45 in projects.

There is no influence of the ageing of the material on its technical performances.

Picture of product(s)



LCA background

Declared unit

The LCI and LCIA results in this EPD relates to environmental impacts incurred by the production and end-of-life of 1 m^2 of six different product variants.

Name	Value			Unit
Thickness	**15**	**25**	**35**	**mm**
Declared unit	1	1	1	m^2
Density	480	448	426	kg/m^3
Density (area)	7,2	11,2	14,9	kg/m^2
Scaling factor	0,6	1	1,4	-

Functional unit

Not defined.

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804:2012+A2:2019,
PCR 16449:2014 – "Wood and wood-based products - Calculation of the biogenic carbon content of wood and conversion to carbon dioxide",
PCR EN 16485:2014 – "Round and sawn timber - Environmental Product Declarations - Product category rules for wood and wood-based products for use in construction",
c-PCR Wood cement - Mineral-bonded wooden composites (IBU, 2019).

Energy modelling principles

Foreground system:

The product is produced using thermal energy from wood chips for the drying process as well as renewable electricity from wind, covered by GO, in production, petroleum and diesel are used for internal transport with forklifts.

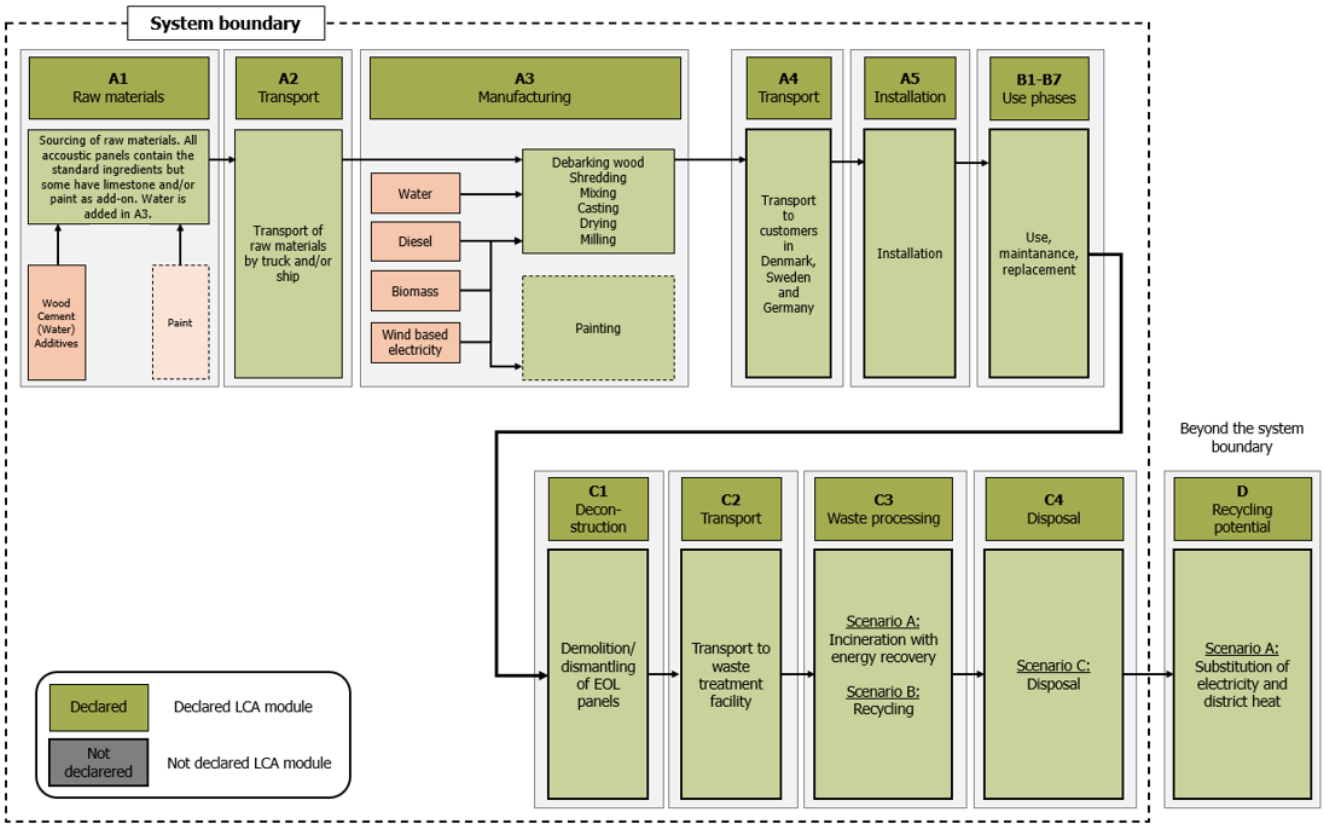
Information about the energy mix in the foreground system (emission factor is given as GWP-total):

Dataset	EF	Unit
Electricity production, wind, 1-3MW turbine, offshore, ref. year 2024	0,0167	kg CO_2e/kWh
Heat production, wood chips from industry, at furnace 5000kW, state-of-the-art, ref. year 2024	0,0055	kg CO_2e/MJ
Market for liquefied petroleum gas	1,1	kg CO_2e/kg
Market for diesel, burned in building machine	0,1	kg CO_2e/MJ

Background system:

Other processes upstream and downstream from the production are modelled with processes from the Ecoinvent v.3.10.1 database that is based on average data.

Flowdiagram



System boundary

This EPD is based on a cradle-to-grave LCA, in which 99,8% of available product mass data and processes 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.

Norwegian spruce logs from local forests are received and the bark is removed. The wood is stored outdoor for six months until the moisture content in the wood drops to approximately 30%. The wood is then shredded to produce wool. The wood wool is mixed together with Portland cement, water, and additives. Form oil is auxiliary. The mixture is moulded and cured using a heat press and dried with a biomass-fired oven. The moulded panel is milled to remove any material in excess and cut edges. After 4 weeks of curing, the panel can be painted before being stored on a pallet, packaged and transported to central distribution warehouses.

For painted panels the energy consumption is evenly allocated, whereas solid and liquid/sludge paint waste or painted discarded panels are separately treated and modelled subjected to wastewater treatment and/or incineration as hazardous waste.

Some wooden by-products generated during manufacture end up as soil improvers externally (reaching end-of-waste state).

Carbon balance

Biogenic: Absorption of biogenic CO_2 by the purchased wood was considered in A1. All biogenic CO_2 is modelled as re-emitted during any of the end-of-life scenarios in C3 and C4, regardless of time horizon. The same applies for the packaging of wood pallet and cardboard, in which their biogenic carbon content is balanced in A5.

Fossil: Absorption of some fossil CO_2, originating from the calcination of limestone during cement production, happens when the cement is mixed with water. The majority is absorbed during the use phase B1, and all the absorbed fossil CO_2 is finally re-emitted during end-of-life incineration in C4. However, it is assumed to be sequestered in the cement paste in the end-of-life scenarios of landfilling, respectively.

Construction process stage (A4-A5) includes:

For transport and distribution, a simple average transport distance of 312 km is assumed to the capital of Denmark (Copenhagen), based on distances from Google Maps. The product is transported by a state-of-art truck.

The panels are installed using steel screws, electricity for screwdrivers, powered by the average electricity mix of Denmark. The packaging waste is sorted for recycling. 5% material loss is assumed in terms of off-cuts. The off-cuts are incinerated 50 km away in a waste-to-energy incinerator. A state-of-art truck transports the off-cuts.

Use stage (B1-B7) includes:

Carbonation of the cement contained in the panel is assumed during the use phase (B1).

Modules B2-B7 are also declared but have no impacts, as no operation, maintenance nor replacement is needed, given that the long reference service lifetime of the product exceeds the reference period of any building LCA in which the EPD is applied.

End of Life (C1-C4) includes:

To consider the regional differences in waste management practice, two scenarios are modelled:

The panel is dismantled at the end of its reference service life using a screwdriver, powered by the average electricity mix of Denmark. The screws are collected for recycling, and the panel is transported to end of life waste management (C3-C4).

Two relevant scenarios are declared

(i). Incineration, assumed as the prescribed treatment, where energy is recovered from the wood component of the panel at a >60% high efficiency (C3). This scenario is common in Denmark.
(ii). Landfilling, in which an average landfilling scenario for inert waste is declared (C4).

The transport distance (C2) to the nearest incineration plant or landfill is assumed to be 50 km for both options.

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

(i). The energy substituted from incineration with energy recovery is modelled as the average electricity grid mix (for electricity) and district heat of Denmark.
(ii). No credits are given for the landfill scenario.

The incineration of packaging and off-cuts in A5 are credited in module D. The screws recovered in C1 and recycled in C3 is also credited in module D.

No credits are given to the paint component of painted panels in either end-of-life scenario.

LCA results

Reminder: Further below the results for the paint layer are presented. Depending on the selected EOL scenario in C2-C4 and D, the same scenario shall be added together with the corresponding scenario of the paint layer results, if considering a painted product. All other modules are added together from the results of the unpainted panel and the results from the paint layer. Please also see the description in "Additional information" below.

Results for SOLID Akustikplade, unpainted panel

ENVIRONMENTAL IMPACTS PER M²															
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**A5**	**B1**	**B2-B7**	**C1**	**C2 Scenario (i)/(ii)**	**C3 Scenario (i)**	**C4 Scenario (ii)**	**D Scenario (i)**	**D Scenario (ii)**
GWP-total	kg CO_2 eq.	-2,74E-01	3,24E-01	-2,31E-01	-1,82E-01	2,03E-01	1,45E+00	-9,90E-01	0.00E+00	9,33E-03	3,73E-02	7,48E+00	6,40E+00	-5,72E-01	0,00E+00
GWP-fossil	kg CO_2 eq.	6,05E+00	3,23E-01	2,71E-01	6,65E+00	2,03E-01	5,98E-01	-9,90E-01	0.00E+00	9,29E-03	3,73E-02	1,14E+00	7,49E-02	-2,34E+00	0,00E+00
GWP-biogenic	kg CO_2 eq.	-6,33E+00	0,00E+00	-5,09E-01	-6,84E+00	4,44E-05	8,50E-01	0,00E+00	0.00E+00	0,00E+00	0,00E+00	6,34E+00	6,33E+00	1,77E+00	0,00E+00
GWP-luluc	kg CO_2 eq.	2,31E-03	1,49E-04	7,26E-03	9,72E-03	7,91E-05	6,62E-04	0,00E+00	0.00E+00	3,98E-05	1,34E-05	4,56E-05	1,36E-05	-5,58E-03	0,00E+00
ODP	kg CFC 11 eq.	2,67E-07	5,89E-09	5,36E-09	2,78E-07	4,24E-09	3,84E-09	0,00E+00	0.00E+00	1,99E-10	7,42E-10	2,74E-09	2,79E-09	-5,47E-08	0,00E+00
AP	mol H^+ eq.	1,95E-02	3,19E-03	2,75E-03	2,55E-02	4,80E-04	2,16E-03	0,00E+00	0.00E+00	5,58E-05	7,76E-05	7,28E-04	4,66E-04	-1,11E-02	0,00E+00
EP-freshwater	kg P eq.	1,73E-04	1,87E-05	2,05E-04	3,97E-04	1,42E-05	8,07E-05	0,00E+00	0.00E+00	6,82E-06	2,51E-06	6,40E-05	3,38E-06	-1,03E-03	0,00E+00
EP-marine	kg N eq.	2,37E-03	7,36E-04	1,03E-03	4,14E-03	1,26E-04	2,55E-03	0,00E+00	0.00E+00	1,00E-05	1,86E-05	3,34E-04	1,99E-04	-2,21E-03	0,00E+00
EP-terrestrial	mol N eq.	4,13E-02	8,16E-03	1,11E-02	6,06E-02	1,36E-03	3,76E-03	0,00E+00	0.00E+00	1,21E-04	2,01E-04	3,06E-03	2,18E-03	-2,42E-02	0,00E+00
POCP	kg NMVOC eq.	1,42E-02	2,71E-03	3,20E-03	2,01E-02	8,34E-04	2,01E-03	0,00E+00	0.00E+00	3,02E-05	1,29E-04	1,09E-03	8,81E-04	-1,00E-02	0,00E+00
ADPm[1]	kg Sb eq.	9,00E-06	8,34E-07	2,39E-06	1,22E-05	5,81E-07	2,81E-06	0,00E+00	0.00E+00	2,93E-07	1,24E-07	4,08E-07	9,55E-08	-3,69E-05	0,00E+00
ADPf[1]	MJ	4,86E+01	4,40E+00	4,55E+00	5,75E+01	3,05E+00	4,43E+00	0,00E+00	0.00E+00	1,49E-01	5,25E-01	2,07E+00	1,87E+00	-4,73E+01	0,00E+00
WDP[1]	m^3 world eq. deprived	3,83E-01	1,98E-02	2,60E-01	6,64E-01	1,56E-02	1,07E-01	0,00E+00	0.00E+00	1,68E-02	2,61E-03	1,50E-01	6,39E-03	-2,29E+00	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 PER M²															
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**A5**	**B1**	**B2-B7**	**C1**	**C2 Scenari**	**C3 Scenari**	**C4 Scenari**	**D Scenari**	**D Scenari**

											o (i)/(ii)	o (i)	o (ii)	o (i)	o (ii)
PM	[Disease incidence]	1,99E-03	2,02E-08	5,81E-08	1,99E-03	1,98E-08	1,84E-08	0,00E+00	0.00E+00	3,67E-10	2,75E-09	3,28E-08	0,00E+00	-9,25E-08	0,00E+00
IRP[2]	[kBq U235 eq.]	4,96E-01	4,66E-03	5,04E-02	5,51E-01	3,68E-03	3,30E-02	0,00E+00	0.00E+00	3,32E-03	6,77E-04	3,78E-03	0,00E+00	-9,72E-01	0,00E+00
ETP-fw[1]	[CTUe]	5,14E+01	5,08E-01	2,15E+00	5,41E+01	3,60E-01	1,17E+00	0,00E+00	0.00E+00	5,23E-02	6,98E-02	7,39E-01	0,00E+00	-1,32E+01	0,00E+00
HTP-c[1]	[CTUh]	6,90E-09	6,02E-11	8,56E-10	7,81E-09	3,38E-11	2,19E-10	0,00E+00	0.00E+00	5,83E-12	6,26E-12	1,90E-10	0,00E+00	-9,59E-10	0,00E+00
HTP-nc[1]	[CTUh]	3,19E-07	2,32E-09	8,68E-09	3,30E-07	1,97E-09	4,69E-03	0,00E+00	0.00E+00	3,09E-10	3,32E-10	8,72E-09	0,00E+00	-3,90E-08	0,00E+00
SQP[1]	-	4,18E+02	2,25E+00	7,19E+01	4,92E+02	3,07E+00	2,60E+01	0,00E+00	0.00E+00	2,61E-01	3,17E-01	2,57E+00	3,78E+00	-1,37E+02	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														
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															
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**A5**	**B1**	**B2-B7**	**C1**	**C2 Scenario (i)/(ii)**	**C3 Scenario (i)**	**C4 Scenario (ii)**	**D Scenario (i)**	**D Scenario (ii)**
PERE	[MJ]	3,90E+01	6,56E-02	1,56E+01	5,47E+01	4,97E-02	-5,33E+00	0,00E+00	0.00E+00	2,31E-01	9,18E-03	-7,39E+01	0,00E+00	-2,85E+01	0,00E+00
PERM	[MJ]	3,34E+01	0,00E+00	4,69E+00	3,81E+01	0,00E+00	-1,25E+00	0,00E+00	0.00E+00	0,00E+00	0,00E+00	-3,34E+01	0,00E+00	-1,04E+01	0,00E+00
PERT	[MJ]	7,24E+01	6,56E-02	2,03E+01	9,28E+01	4,97E-02	-6,58E+00	0,00E+00	0.00E+00	2,31E-01	9,18E-03	-1,07E+02	0,00E+00	-3,89E+01	0,00E+00
PENRE	[MJ]	2,92E+01	4,40E+00	3,99E+00	3,76E+01	3,05E+00	2,65E+00	0,00E+00	0.00E+00	1,49E-01	5,25E-01	2,07E+00	0,00E+00	-4,35E+01	0,00E+00
PENRM	[MJ]	2,05E+01	0,00E+00	3,80E-01	2,08E+01	0,00E+00	-3,80E-01	0,00E+00	0.00E+00	0,00E+00	0,00E+00	-8,92E-01	0,00E+00	-1,38E+01	0,00E+00
PENRT	[MJ]	4,97E+01	4,40E+00	4,37E+00	5,84E+01	3,05E+00	2,27E+00	0,00E+00	0.00E+00	1,49E-01	5,25E-01	1,18E+00	0,00E+00	-5,73E+01	0,00E+00
SM	[kg]	6,22E-02	2,16E-03	1,88E-02	8,31E-02	1,32E-03	2,45E-02	0,00E+00	0.00E+00	8,48E-05	2,44E-04	4,66E-03	0,00E+00	-2,40E-02	0,00E+00
RSF	[MJ]	6,78E+00	1,96E-05	1,54E-01	6,94E+00	1,66E-05	2,17E-01	0,00E+00	0.00E+00	5,76E-07	3,08E-06	6,72E-05	0,00E+00	-1,07E-02	0,00E+00
NRSF	[MJ]	4,37E-02	0,00E+00	0,00E+00	4,37E-02	0,00E+00	2,75E-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
FW	[m^3]	1,73E-01	5,32E-04	1,02E-02	1,84E-01	4,50E-04	5,01E-03	0,00E+00	0.00E+00	5,47E-04	7,15E-05	2,87E-03	0,00E+00	-5,19E-02	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															
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**A5**	**B1**	**B2-B7**	**C1**	**C2 Scenario (i)/(ii)**	**C3 Scenario (i)**	**C4 Scenario (ii)**	**D Scenario (i)**	**D Scenario (ii)**
HWD	[kg]	1,70E-02	6,53E-03	2,32E-02	4,67E-02	4,42E-03	7,99E-02	0,00E+00	0.00E+00	9,12E-04	7,62E-04	3,10E-02	0,00E+00	-2,20E-01	0,00E+00
NHWD	[kg]	4,97E-01	1,22E-01	7,34E-01	1,35E+00	8,84E-02	2,94E+00	0,00E+00	0.00E+00	3,33E-02	1,61E-02	2,57E+01	0,00E+00	-1,44E+01	0,00E+00
RWD	[kg]	1,91E-04	1,15E-06	1,26E-05	2,05E-04	9,10E-07	3,87E-05	0,00E+00	0.00E+00	7,56E-07	1,68E-07	9,26E-07	0,00E+00	-2,28E-04	0,00E+00
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	1,17E-02	4,42E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	8,46E-03	0,00E+00	1,55E-02	2,40E-02	0,00E+00	3,74E-01	0,00E+00	0.00E+00	1,64E-10	7,05E-09	6,00E-02	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	3,18E-04	0,00E+00	0,00E+00	3,18E-04	0,00E+00	1,59E-05	0,00E+00	0.00E+00	4,03E-05	7,44E-04	1,27E+01	0,00E+00	0,00E+00	0,00E+00
EEE	[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	9,08E-06	1,88E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[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	2,67E-06	7,87E-05	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														

BIOGENIC CARBON CONTENT PER M^2		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	1,72
Biogenic carbon content in accompanying packaging	kg C	0,15
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Results for paint layer

ENVIRONMENTAL IMPACTS PER M²															
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**A5**	**B1**	**B2-B7**	**C1**	**C2 Scenario (i)/(ii)**	**C3 Scenario (i)**	**C4 Scenario (ii)**	**D Scenario (i)**	**D Scenario (ii)**
GWP-total	kg CO_2 eq.	2,59E-01	4,23E-02	1,32E-01	4,33E-01	3,57E-03	2,67E-02	0.00E+00	0.00E+00	0.00E+00	2,18E-03	2,54E-03	1,35E-03	0.00E+00	0.00E+00
GWP-fossil	kg CO_2 eq.	3,51E-01	4,23E-02	1,32E-01	5,26E-01	3,57E-03	2,67E-02	0.00E+00	0.00E+00	0.00E+00	2,18E-03	2,54E-03	1,35E-03	0.00E+00	0.00E+00
GWP-biogenic	kg CO_2 eq.	-9,40E-02	9,22E-06	-6,24E-05	-9,40E-02	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	0.00E+00
GWP-luluc	kg CO_2 eq.	1,34E-03	1,65E-05	2,48E-05	1,38E-03	1,39E-06	6,91E-05	0.00E+00	0.00E+00	0.00E+00	7,84E-07	7,56E-07	2,45E-07	0.00E+00	0.00E+00
ODP	kg CFC 11 eq.	8,89E-09	8,82E-10	1,34E-09	1,11E-08	7,45E-11	5,63E-10	0.00E+00	0.00E+00	0.00E+00	4,34E-11	4,58E-11	5,05E-11	0.00E+00	0.00E+00
AP	mol H^+ eq.	1,59E-03	9,97E-05	1,70E-04	1,86E-03	8,42E-06	9,39E-05	0.00E+00	0.00E+00	0.00E+00	4,54E-06	1,21E-05	8,42E-06	0.00E+00	0.00E+00
EP-freshwater	kg P eq.	1,03E-04	2,95E-06	3,97E-05	1,45E-04	2,49E-07	7,28E-06	0.00E+00	0.00E+00	0.00E+00	1,47E-07	1,07E-06	6,10E-08	0.00E+00	0.00E+00
EP-marine	kg N eq.	3,17E-04	2,62E-05	1,13E-04	4,56E-04	2,21E-06	2,30E-05	0.00E+00	0.00E+00	0.00E+00	1,09E-06	5,59E-06	3,60E-06	0.00E+00	0.00E+00
EP-terrestrial	mol N eq.	3,30E-03	2,83E-04	4,41E-04	4,03E-03	2,39E-05	2,04E-04	0.00E+00	0.00E+00	0.00E+00	1,18E-05	5,11E-05	3,94E-05	0.00E+00	0.00E+00
POCP	kg NMVOC eq.	1,63E-03	1,73E-04	1,84E-04	1,99E-03	1,46E-05	1,01E-04	0.00E+00	0.00E+00	0.00E+00	7,56E-06	1,82E-05	1,59E-05	0.00E+00	0.00E+00
ADPm[1]	kg Sb eq.	3,39E-06	1,21E-07	3,91E-07	3,90E-06	1,02E-08	1,96E-07	0.00E+00	0.00E+00	0.00E+00	7,27E-09	6,44E-09	1,73E-09	0.00E+00	0.00E+00
ADPf[1]	MJ	5,81E+00	6,35E-01	7,17E-01	7,16E+00	5,36E-02	3,63E-01	0.00E+00	0.00E+00	0.00E+00	3,07E-02	3,45E-02	3,37E-02	0.00E+00	0.00E+00
WDP[1]	m^3 world eq. deprived	1,00E-01	3,25E-03	1,61E-02	1,20E-01	2,74E-04	6,01E-03	0.00E+00	0.00E+00	0.00E+00	1,53E-04	2,51E-03	1,15E-04	0.00E+00	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 = Acidifcation; 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 PER M^2															
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**A5**	**B1**	**B2-B7**	**C1**	**C2 Scenario (i)/(ii)**	**C3 Scenario (i)**	**C4 Scenario (ii)**	**D Scenario (i)**	**D Scenario (ii)**
PM	[Disease incidence]	1,91E-08	4,12E-09	2,31E-09	2,55E-08	3,48E-10	1,31E-09	0.00E+00	0.00E+00	0.00E+00	1,61E-10	5,48E-10	2,13E-10	0.00E+00	0.00E+00
IRP[2]	[kBq U235 eq.]	1,90E-02	7,65E-04	3,40E-03	2,32E-02	6,46E-05	1,17E-03	0.00E+00	0.00E+00	0.00E+00	3,96E-05	6,14E-05	2,87E-05	0.00E+00	0.00E+00
ETP-fw[1]	[CTUe]	2,38E+00	7,48E-02	2,05E+00	4,50E+00	6,31E-03	2,26E-01	0.00E+00	0.00E+00	0.00E+00	4,08E-03	1,23E-02	1,80E-03	0.00E+00	0.00E+00
HTP-c[1]	[CTUh]	2,22E-10	7,04E-12	1,43E-10	3,71E-10	5,94E-13	1,86E-11	0.00E+00	0.00E+00	0.00E+00	3,66E-13	3,17E-12	1,65E-13	0.00E+00	0.00E+00
HTP-nc[1]	[CTUh]	1,88E-08	4,10E-10	5,20E-10	1,97E-08	3,46E-11	9,88E-10	0.00E+00	0.00E+00	0.00E+00	1,94E-11	1,46E-10	5,00E-12	0.00E+00	0.00E+00
SQP[1]	-	9,24E+00	6,39E-01	2,05E-01	1,01E+01	5,39E-02	5,10E-01	0.00E+00	0.00E+00	0.00E+00	1,86E-02	4,22E-02	6,83E-02	0.00E+00	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														
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															
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**A5**	**B1**	**B2-B7**	**C1**	**C2 Scenario (i)/(ii)**	**C3 Scenario (i)**	**C4 Scenario (ii)**	**D Scenario (i)**	**D Scenario (ii)**
PERE	[MJ]	8,39E-01	1,03E-02	4,07E-02	8,89E-01	8,72E-04	4,46E-02	0.00E+00	0.00E+00	0.00E+00	5,38E-04	-1,24E+00	6,95E-04	0.00E+00	0.00E+00
PERM	[MJ]	8,23E-01	0,00E+00	0,00E+00	8,23E-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	0.00E+00	0.00E+00
PERT	[MJ]	1,66E+00	1,03E-02	4,07E-02	1,71E+00	8,72E-04	4,46E-02	0.00E+00	0.00E+00	0.00E+00	5,38E-04	-1,24E+00	6,95E-04	0.00E+00	0.00E+00
PENRE	[MJ]	4,84E+00	6,35E-01	-1,54E-01	5,32E+00	5,36E-02	2,71E-01	0.00E+00	0.00E+00	0.00E+00	3,07E-02	3,45E-02	3,37E-02	0.00E+00	0.00E+00
PENRM	[MJ]	5,23E-01	0,00E+00	8,70E-01	1,39E+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	0.00E+00	0.00E+00
PENRT	[MJ]	5,36E+00	6,35E-01	7,17E-01	6,71E+00	5,36E-02	2,71E-01	0.00E+00	0.00E+00	0.00E+00	3,07E-02	3,45E-02	3,37E-02	0.00E+00	0.00E+00
SM	[kg]	4,76E-03	2,74E-04	2,62E-04	5,29E-03	2,32E-05	2,67E-04	0.00E+00	0.00E+00	0.00E+00	1,43E-05	7,77E-05	8,01E-06	0.00E+00	0.00E+00
RSF	[MJ]	2,77E-02	3,46E-06	4,01E-06	2,77E-02	2,92E-07	1,39E-03	0.00E+00	0.00E+00	0.00E+00	1,80E-07	1,10E-06	2,01E-07	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	0,00E+00	0,00E+00	0,00E+00	0.00E+00	0.00E+00
FW	[m^3]	2,89E-03	9,37E-05	-3,92E-03	-9,41E-04	7,91E-06	-4,63E-05	0.00E+00	0.00E+00	0.00E+00	4,18E-06	4,80E-05	3,84E-05	0.00E+00	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															
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**A5**	**B1**	**B2-B7**	**C1**	**C2 Scenario (i)/(ii)**	**C3 Scenario (i)**	**C4 Scenario (ii)**	**D Scenario (i)**	**D Scenario (ii)**
HWD	[kg]	4,21E-02	9,18E-04	2,12E-02	6,42E-02	7,75E-05	3,22E-03	0.00E+00	0.00E+00	0.00E+00	4,46E-05	5,18E-04	2,54E-05	0.00E+00	0.00E+00
NHWD	[kg]	1,31E+00	1,84E-02	4,19E+00	5,52E+00	1,55E-03	2,76E-01	0.00E+00	0.00E+00	0.00E+00	9,42E-04	4,31E-01	6,10E-04	0.00E+00	0.00E+00
RWD	[kg]	4,80E-06	1,89E-07	8,98E-07	5,88E-06	1,60E-08	2,96E-07	0.00E+00	0.00E+00	0.00E+00	9,84E-09	1,51E-08	6,76E-09	0.00E+00	0.00E+00
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	0.00E+00	0,00E+00	0,00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	2,73E-04	0,00E+00	0,00E+00	2,73E-04	0,00E+00	1,37E-05	0.00E+00	0.00E+00	0.00E+00	0,00E+00	0,00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	7,80E-03	0,00E+00	0,00E+00	7,80E-03	0,00E+00	3,90E-04	0.00E+00	0.00E+00	0.00E+00	0,00E+00	2,30E-01	0.00E+00	0.00E+00	0.00E+00
EEE	[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	0,00E+00	0,00E+00	0.00E+00	0.00E+00	0.00E+00
EET	[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	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														

BIOGENIC CARBON CONTENT PER M^2 – PAINT LAYER		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information

Supplementary Datasets & Scaling Factors:

This section provides a supplementary dataset that can be added onto the LCA results in order to account for an optional coating of SOLID acoustic panels with decorative paint applied in the production phase. All declared products have the option to receive surface treatment.

It should be noted that the same amount of paint is applied regardless of panel thickness. Because of this, scaling factors should always be applied before adding the supplementary datasets for paint to the results of the declared product. When applying a scaling factor to adjust the panel thickness or adding the optional surface treatment, the results of a specific module should hence be calculated using the following linear equation (Eq. 1):

$$y = a * x + b \qquad (Eq.\ 1)$$

Where…

y = the impact results of the panels. The specific results of a given panel variation depends on the thickness and optional surface treatment.
a = the impact of the unpainted panel at the default thickness as listed in the LCA Results section.
x = the scaling factor for adjusting the thickness of the panel, if it deviated from the default value of the given panel.
b = the impact of the optional paint treatment for the relevant products as listed in the supplementary datasets.

Calculation guide:

Step 1: Scale the environmental impact results (factor a in *Eq. 1*) down from 25 mm to 15 mm, or up from 25 mm to 35 mm, using the scaling factors (factor x in *Eq. 1*) in the table of LCA Background chapter.

Step 2: If the panel is painted in addition, the environmental impact results for the paint component (factor b in *Eq. 1*). The results must be added module-wise on top of each other.

Example:

GWP-total of a painted 35 mm panel in A1-A3 is calculated.

Step 1: A 25 mm panel has in A1-A3: -0,182 kg CO_2e/m^2. This is scaled from the results of this EPD with the scaling factor of 1,4: (-0,182 kg CO_2e/m^2) * 1,4 = -0,255 kg CO_2e/m^2

Step 2: The paint layer GWP-total in the same modules, A1-A3, is 0,433 kg CO_2e/m^2. It is added on top of the scaled value in Step 1: -0,255 kg CO_2e/m^2 + 0,433 kg CO_2e/m^2 = 0,178 kg CO_2e/m^2. Thus, a painted 35 mm panel will have a total GWP-total of 0,178 kg CO_2e/m^2 or 1,78E-01.

LCA interpretation

The environmental impact contribution of the different product materials depends much on which lifecycle modules are observed. Focusing on GWP in A1-A3, cement bears the biggest burden, while the wood wool acts as a carbon sink in A1-A3 and thus expresses a negative value, initially more than offsetting the carbon from cement. However, the biogenic carbon is eventually released in all cases, but the fossil carbon sequestered in the use phase is only released in the EOL incineration scenario, while it is retained in the EOL recycling and EOL landfilling scenarios. Paint contributes moderately to the overall GWP.

The foreground processes contributing most to the environmental impact in A1-A3, apart from raw material supply in A1, is primarily the raw material transport in A2 and to a less extent the production process in A3 because all consumed electricity is renewable.

Technical information on scenarios

Transport to the building site (A4)

Scenario information	Value	Unit
Fuel type	Diesel	-
Vehicle type	Lorry, EURO 6, >32 t gross weight	-
Transport distance to markets	312 (DK)	km
Capacity utilisation (including empty runs)	85	%
Gross density of products transported	426 - 480	kg/m^3
Capacity utilisation volume factor	1	-

Installation of the product in the building (A5)

Scenario information	Value	Unit
Ancillary materials (screws)	0,060	kg
Energy type and consumption	0,060	kWh
Waste materials (packaging)	0,373	kg
Output materials (off-cuts)	0,955	kg
Direct emissions to air, soil or water	-	kg

Reference service life

RSL information		Unit
Reference service Life	60	Years
Declared product properties	25mm SOLID Acoustic Panel 1.0mm White - 60x120cm - Acoustic Panels - Bygma 25 mm SOLID Akustikplade Lys natur - 60x240 cm - Akustikplader - Bygma	-
Outdoor environment	No	-
Indoor environment	Yes	-
Installation	https://www.bygma.dk/b2c/api/Util/DownloadItem?dbNumber=2576133&m3Number=348708&fileId=ed7d4370-064f-4e16-9815-38f5c5f5675d	-

Use (B1-B7)

Scenario information	Value	Unit
B1 – Use		
Carbonatization	0,99	kg CO_2
B2 – Maintenance		
Maintenance process	N/A	
Maintenance cycle	N/A	/year
Ancillary materials for maintenance (specify which)	N/A	kg/cycle
Waste materials resulting from maintenance (specify which)	N/A	kg
Net freshwater consumption during maintenance	N/A	m^3
Energy input during maintenance	N/A	kWh
B4 – Replacement		
Replacement cycle	N/A	/year
Energy input during replacement	N/A	kWh
Exchange of worn parts during products life cycle	N/A	kg

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	12,73 (unpainted) 12,97 (painted)	kg
Collected with mixed waste	0	kg
For reuse	-	kg
For energy recovery (Scenario (i))	12,73 (unpainted) 12,97 (painted) 0,06 (screws recycled)	kg
For recycling (Scenario (ii))	Same as above	kg
For final disposal (Scenario (ii))	Same as above	kg
Assumptions for scenario development	See description in section "End of Life (C1-C4)"	-

Re-use, recovery and recycling potential (D)

Scenario information/Material	Value	Unit
Scenario (ii): Displaced material (wood chips)	12,73 (unpainted)	kg
Scenario (i)/(ii)/(iii): Displaced material (metal screws)	0,06	kg

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.

SOLID Acoustic panels are Indoor Climate Labelled, M1 labelled, Blauer Engel labelled.

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

Publisher	www.epddanmark.dk Template version 2024.1
Programme operator	Danish Technological Institute Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Stefan Emil Danielsson SDG Consulting
LCA software /background data	Software: OneClick LCA Database: Ecoinvent v.3.10 EN 15804 reference package EF 3.1
3rd party verifier	Mirko Miseljic LCA Specialists lcaspecialists@outlook.com Verified according to Verification Checklist 1 v. 2.9.1

General programme instructions
General Programme Instructions, version 2.0, spring 2020
www.epddanmark.dk

EN 15804
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Product Category Rule A
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Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report. v.1.8. IBU, 2019

Product Category Rule B
Product Category Rule B Product Category Rule B, IBU, 2019, Part B, Requirements on the EPD for Wood cement – Mineral bonded wooden composites. v.1.7. IBU, 2019.

EN 16449
EN 16449:2014 – “Wood and wood-based products - Calculation of the biogenic carbon content of wood and conversion to carbon dioxide”

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EN 15942
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ISO 14025
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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”

BYGMA general website
https://www.bygma.dk/

BYGMA products
25mm SOLID Acoustic Panel 1.0mm White - 60x120cm - Acoustic Panels - Bygma

25 mm SOLID Akustikplade Lys natur - 60x240 cm - Akustikplader - Bygma