

Owner: a:gain  
No.: MD-23126-EN  
Issued: 26-03-2025  
Valid to: 26-03-2030

3<sup>rd</sup> PARTY VERIFIED

**EPD**

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804



**Owner of declaration**

A:gain  
 Langebrogade 3H, 3. sal  
 DK- 1411 København  
 CVR: 36902701



**Issued:**  
26-03-2025

**Valid to:**  
26-03-2030

**Programme**

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



- Industry EPD
- Product EPD

**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.

**Declared product(s)**

Thermally treated wooden facade cladding:  
 - Bronsø

Number of declared datasets/product variations: 1

**Production site**

Langebrogade 3H, 3. sal  
 DK- 1411 København

**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

**Use of Guarantees of Origin**

- No certificates used
- Electricity covered by GoO
- Biogas covered by GoO

**Declared/ functional unit**

1 m<sup>3</sup>

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

1/9-2021 – 31/8-2022

**EPD version**

Version 1.0.

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

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	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

## Product information

### Product description

The main product components are shown in the table below.

Material	Amount [kg]	Weight-% of declared product
Thermo pine	430,0	100%
<b>TOTAL</b>	<b>430,0</b>	<b>100%</b>

The thermo pine has a moisture content of 5%.

### Product packaging:

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

Packaging	Amount [kg]	Weight-% of sales packaging
Wood Beams	2.07	93.0%
Film	0.06	2.7%
Strapex	0.10	4.3%
<b>TOTAL</b>	<b>2.23</b>	<b>100%</b>

### Representativity

This EPD covers the declared unit of 1 m<sup>3</sup> thermally treated wood for façade cladding. In terms of temporal representativeness, specific data was provided by the manufacturer and is less than 5 years old, as it is production data from 2022. Upstream and downstream processes are modelled using generic data from Ecoinvent. Although some datasets are based on data from older reference years, ecoinvent extrapolates the data to 2022 and uncertainties are adjusted accordingly.

### Picture of product(s)



### Hazardous substances

The product does not contain 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 product is to be used as an outdoor facade cladding. It can be used to protect the building from external conditions, while simultaneously improving sound and thermal insulation.

### Essential characteristics

Further technical information can be obtained by contacting the a:gain or on the a:gain's website:

<https://www.again.dk/products/cladding/bronso>

### Reference Service Life (RSL)

Not defined.

# LCA background

## Declared unit

The LCI and LCIA results in this EPD relates to 1 m<sup>3</sup> thermally treated facade cladding.

Name	Value	Unit
Declared unit	1	m <sup>3</sup>

## Functional unit

The use-phase is not included in the study, so the function of product is not defined.

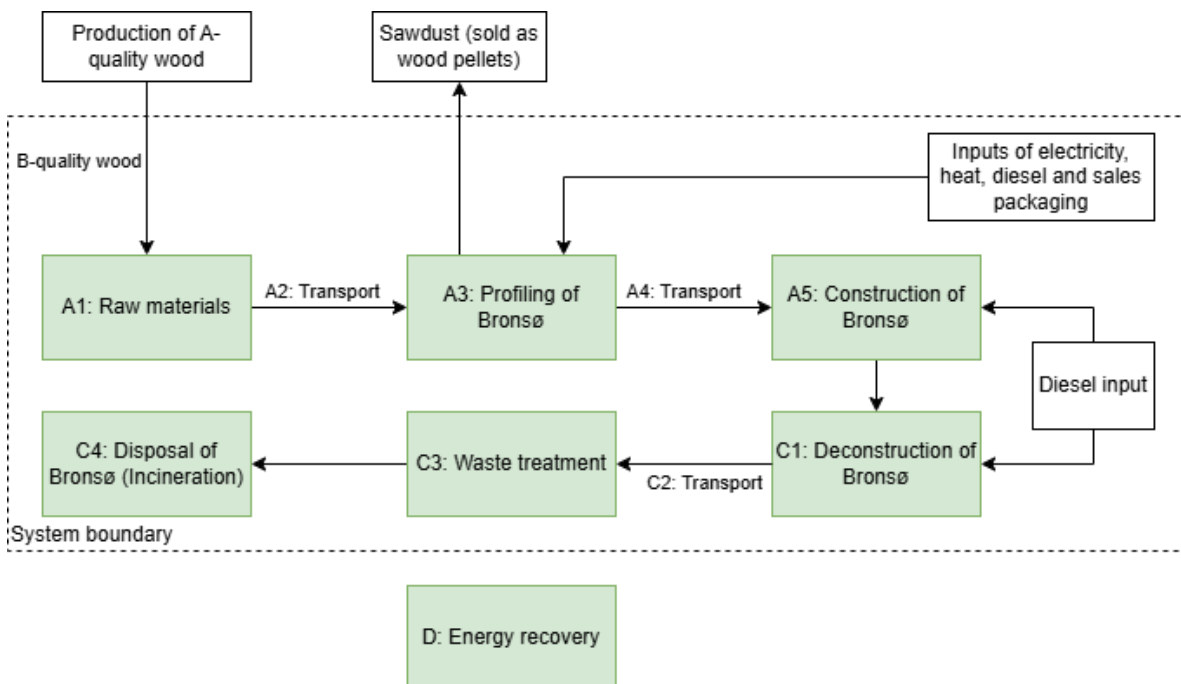
## Material properties

Name	Mass factor (kg/DU)
Bronlø	430

## PCR

This EPD is developed in accordance with the core rules for the product category of construction products in EN 15804+A2 and the complementary rules in EN 16485:2014 (product category rules for wood and wood-based products for use in construction).

## Flowdiagram



## Conversion factors

Name	Conversion factor from 1 m <sup>3</sup> to 1 kg
Bronlø	0.0022

## Energy modelling principles

The manufacturer does not purchase guarantees of origin. The LCA study is therefore modelled as described in the following.

The foreground system is modelled using the national electricity residual mix of Denmark, see the table below for further information.

Energy mix	EF	Unit
Residual grid mix, DK.	0.648	kg CO <sub>2</sub> e/kWh
Heat production, wood chips	0.001	kg CO <sub>2</sub> e/MJ

## Background system:

The background system is modelled using electricity grid mixes both upstream and downstream.

## System boundary

This EPD is based on a cradle-to-gate LCA, in which 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

A:gain purchases discarded thermo pine from a Danish manufacturer. The pine is discarded due to aesthetic defects and does not fulfil the requirements for A-quality wood. The wood is profiled by the manufacturer according to a:gains specifications. The wood is then packaged and sold directly from the manufacturer to a:gains customers.

Economic allocation is used to allocate the raw material inputs in module A1 to the Bronsø product and to the A-quality thermos pine. In addition, economic allocation is used to allocate the production inputs in module A3 to the profiled wood and the wood cut offs. The wood cut offs are generated during production and are sold.

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

A4 – Transport

A5 – Installation

After the profiling and packaging, Bronsø is transported to the customer, which is accounted for in module A4. In module A5, the cladding is installed on-site at the customer's location, with diesel as the assumed energy input.

### Use stage (B1-B7) includes:

Not included.

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

C1 – Deconstruction and demolition

C2 – Transport

C3 – Waste processing for reuse, recovery and/or recycling

C4 – Disposal

The end-of-life is modelled under the assumption that the profiled wood is collected with mixed construction waste and incinerated in Denmark. It could be expected that some of the wood is reused or recycled, however the share is unknown. As per EN 16485, waste treatment also includes shredding of the wood prior to incineration.

Crushing and incinerating the profiled wood is modelled in module C4 in accordance with EN 16485 as the energy recovery from incineration (R1-value) is below 0.60. No burdens are therefore allocated to module C3.

Transport to waste treatment (C2) is modelled by estimating the distance from the construction site to the nearest incineration plants. The deconstruction/demolition (C1) is modelled with generic factors for demolition from the Danish EPA. .

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

D – Reuse, Recovery and/or recycling potentials

Energy is recovered from the incineration of the Bronsø product at the end-of-life and from the incineration of the packaging materials.



## LCA results

The LCIA results are calculated using the Environmental Footprint (EF 3.1), EN15804+A2 (adapted) v.1.00 impact methodology. This is in accordance with EN15804+A2:2019.

Environmental Impacts per m <sup>3</sup>									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO <sub>2</sub> eq.	-6,25E+02	2,05E+01	5,74E+00	2,19E+00	1,35E+00	0,00E+00	6,76E+02	1,38E+02
GWP-fossil	kg CO <sub>2</sub> eq.	2,73E+01	2,05E+01	2,61E+00	2,19E+00	1,35E+00	0,00E+00	2,66E+01	1,38E+02
GWP-biogenic	kg CO <sub>2</sub> eq.	-6,52E+02	1,39E-02	3,14E+00	2,37E-04	9,11E-04	0,00E+00	6,49E+02	4,85E-02
GWP-luluc	kg CO <sub>2</sub> eq.	2,14E-02	6,83E-03	1,97E-04	1,90E-04	4,49E-04	0,00E+00	5,68E-02	4,80E-02
ODP	kg CFC 11 eq.	2,57E-06	4,08E-07	3,41E-08	3,35E-08	2,68E-08	0,00E+00	3,59E-07	2,40E-06
AP	mol H <sup>+</sup> eq.	1,23E-01	4,28E-02	2,01E-02	1,98E-02	2,81E-03	0,00E+00	1,75E-01	5,56E-01
EP-freshwater	kg P eq.	9,95E-03	1,39E-03	7,45E-05	6,38E-05	9,14E-05	0,00E+00	6,30E-03	5,39E-02
EP-marine	kg N eq.	3,64E-02	1,03E-02	9,38E-03	9,16E-03	6,75E-04	0,00E+00	7,25E-02	1,28E-01
EP-terrestrial	mol N eq.	3,88E-01	1,11E-01	1,02E-01	1,00E-01	7,29E-03	0,00E+00	7,35E-01	1,56E+00
POCP	kg NMVOC eq.	1,16E-01	7,11E-02	3,04E-02	2,99E-02	4,67E-03	0,00E+00	2,12E-01	3,82E-01
ADPm <sup>1</sup>	kg Sb eq.	5,92E-05	6,67E-05	8,34E-07	7,62E-07	4,39E-06	0,00E+00	6,29E-05	2,55E-04
ADPf <sup>1</sup>	MJ	3,81E+02	2,89E+02	2,90E+01	2,86E+01	1,90E+01	0,00E+00	3,37E+02	1,89E+03
WDP <sup>1</sup>	m <sup>3</sup> world eq. deprived	2,24E+01	1,63E+00	1,06E-01	8,39E-02	1,07E-01	0,00E+00	6,83E+00	1,26E+02
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	<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 m <sup>3</sup>									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease incidence]	4,42E-06	1,51E-06	5,65E-07	5,61E-07	9,94E-08	0,00E+00	2,57E-06	3,46E-06
IRP2	[kBq U235 eq.]	3,18E+00	3,75E-01	1,34E-02	1,28E-02	2,46E-02	0,00E+00	1,38E+00	1,71E+01
ETP-fw1	[CTUe]	7,66E+01	7,86E+01	4,57E+00	4,06E+00	5,17E+00	0,00E+00	2,02E+02	3,30E+02
HTP-c1	[CTUh]	6,47E-08	1,46E-07	9,17E-09	8,56E-09	9,59E-09	0,00E+00	2,37E-07	2,08E-07
HTP-nc1	[CTUh]	2,86E-07	1,87E-07	7,82E-09	3,88E-09	1,23E-08	0,00E+00	8,87E-07	1,58E-06
SQP1	-	1,69E+03	1,74E+02	2,13E+00	2,01E+00	1,15E+01	0,00E+00	2,01E+02	3,21E+03
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	<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 m <sup>3</sup>									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	3,27E+02	4,96E+00	1,85E-01	1,75E-01	3,26E-01	0,00E+00	1,69E+01	8,38E+02
PERM	[MJ]	6,25E+03	0,00E+00	-3,00E+01	0,00E+00	0,00E+00	0,00E+00	-6,22E+03	0,00E+00
PERT	[MJ]	6,58E+03	4,96E+00	-2,99E+01	1,75E-01	3,26E-01	0,00E+00	-6,21E+03	8,38E+02
PENRE	[MJ]	3,81E+02	2,89E+02	2,90E+01	2,86E+01	1,90E+01	0,00E+00	3,37E+02	1,89E+03
PENRM	[MJ]	4,74E+00	0,00E+00	-4,74E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	3,86E+02	2,89E+02	2,42E+01	2,86E+01	1,90E+01	0,00E+00	3,37E+02	1,89E+03
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]	8,52E-02	1,69E-03	3,31E-05	3,11E-05	1,11E-04	0,00E+00	2,43E-03	1,18E-03
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> ]	5,27E-01	4,00E-02	2,56E-03	2,05E-03	2,63E-03	0,00E+00	1,67E-01	2,96E+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 <sup>3</sup>									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	2,62E+00	4,21E-01	4,42E-02	3,20E-02	2,77E-02	0,00E+00	3,09E+00	1,46E+01
NHWD	[kg]	5,12E+01	8,90E+00	2,76E+00	4,37E-01	5,85E-01	0,00E+00	4,78E+02	2,69E+02
RWD	[kg]	7,78E-04	9,31E-05	3,29E-06	3,14E-06	6,12E-06	0,00E+00	3,45E-04	4,21E-03
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]	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]	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]	3,57E+02	0,00E+00	4,22E+00	0,00E+00	0,00E+00	0,00E+00	7,48E+02	0,00E+00
EET	[MJ]	7,19E+02	0,00E+00	1,60E+01	0,00E+00	0,00E+00	0,00E+00	1,51E+03	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 [1 m3]		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	2.14E+02
Biogenic carbon content in accompanying packaging	[kg C]	2.0E+00
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO <sub>2</sub>	

## Additional information

### Interpretation

The most contributing processes are to be found in modules A3 and C4. For A3, use of electricity, due to planning and profiling wood, is the most contributing factor when looking at GWP-fossil, EP-freshwater, ADPf & WDP. For ODP it is the packaging that contributes the most in A3. For module C4 the largest contribution comes from either incineration of wood or treatment of wasted wood. For GWP-total and WDP it is the incineration of wood that contributes the most. For the other impact categories, it is the post consumed wood for treatment of wasted wood that contributes the most. The transportation under the construction stage, A4, also leaves a certain impact, especially when it comes to ADPm.

**No significant contribution is found in the raw material extraction due to economic allocation which is why only storage of CO<sub>2e</sub> has been accounted for.**

### End of life (C1-C4)

Scenario information	Value	Unit
Collected with mixed waste	1	m <sup>3</sup>
For energy recovery	1	m <sup>3</sup>
Assumptions for scenario development		As appropriate

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

Scenario information/Material	Value	Unit
Energy recovery from waste incineration ( <b>electricity</b> )	752.4	MJ
Energy recovery from waste incineration ( <b>heat</b> )	1506.4	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> <small>Template version 2024.2</small>
<b>Programme operator</b>	Danish Technological Institute Gregersensvej DK-2630 Taastrup <a href="http://www.teknologisk.dk">www.teknologisk.dk</a>
<b>LCA-practitioner</b>	Transition ApS Regnbuepladsen 7, 1550 København V  Jón Jacobsen, Josefine Fie Birkedal Nielsen, Lasse Langstrup Hågerstrand
<b>LCA software /background data</b>	SimaPro 9.6.0.1 ecoinvent v.3.10.0 (EN15804)
<b>3<sup>rd</sup> party verifier</b>	Mie Ostenfeldt (Ostenfeldt Consulting) <a href="mailto:mie@ostenfeldtconsulting.dk">mie@ostenfeldtconsulting.dk</a>

### 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 16485

DS/EN 16485:2014 - "Product category rules for wood and wood-based products for use in construction".

### 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"