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3rd PARTY VERIFIED

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804



Owner of declaration

Træ.dk c/o Træ- og Møbelindustrien]
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Programme operator

Danish Technological Institute
 www.dti.dk

Programme

EPD Danmark
 www.epddanmark.dk


Declared products

Glulam construction wood products of pine and spruce.

Production site

Denmark.

Products use

Products are used as construction wood in many different types of constructions and is often load bearing. The products are used within the constructions and are not exposed to the outdoor environment.

Declared unit

1 m³ glulam construction wood in various dimensions.

Issued:
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Basis of calculation

This EPD is developed in accordance with the European standards EN 15804 and EN 15485

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

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:



David Althoff Palm, Ramboll



Henrik Fred Larsen
 EPD Danmark

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

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

Product information

Product description

The main product components are shown in the table below.

| Material | Weight-% of declared product |
|----------|------------------------------|
| Wood | 86 ± 2 |
| Moisture | 12 ± 2 |
| Adhesive | ≤2 |

Wood from certified sources is used to produce the products.

Representativity

This declaration, including data collection and the modeled foreground system including results, is based on the production of glulam wood products in Denmark. The timber originates from Sweden, Norway and Finland. Production data is based on a single manufacturing site. The production data was collected for the year 2018. Background data are based on published EPD's and on GaBi ts database version 8.7 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.

Essential characteristics (CE)

The products are covered by EN 14080:2013.

Reference Service Life (RSL)

No RSL is declared. This EPD is based on a cradle-to-gate with options assessment and does not include the use stage.

LCA background

Declared unit

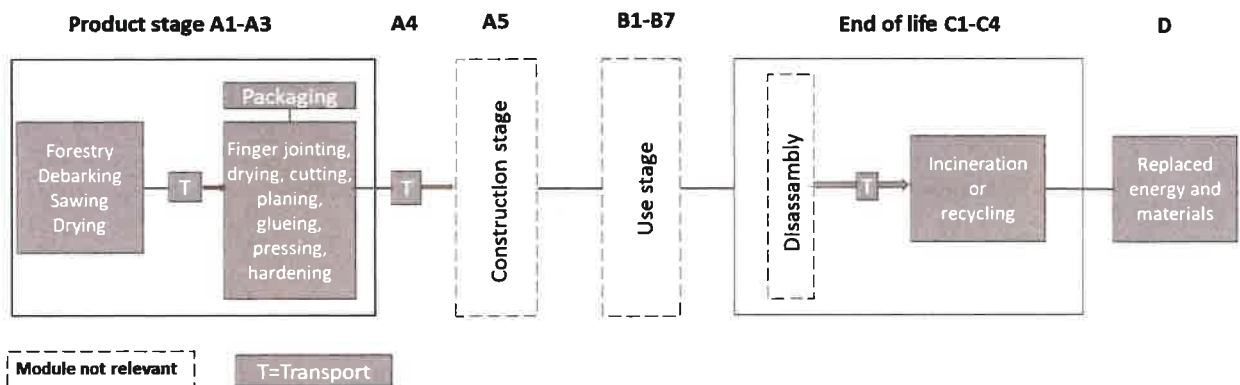
The LCI and LCIA results in this EPD relates to one cubic meter of general dried and sawn construction wood of varying dimensions.

| Name | Value | Unit |
|---------------|-------|-------------------|
| Declared unit | 1 | m ³ |
| Density | 500 | kg/m ³ |

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804 and the PCR EN16485.

Flow diagram



System boundaries

This EPD is based on a cradle-to-gate with options 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. In practice no components are excluded.

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 acquisition of nordic wood logs from forestry as well as all other 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.

A2 – Transport to the production site:

| Construction wood transport to building site | | | |
|--|------------------------------------|---------------|------------------------------|
| Type of transport and payload capacity | Capacity utilized incl. return (%) | Distance (km) | Diesel consumption (l/tonkm) |
| Truck (25t) | 61 | 600 | 2.2E-2 |
| Ferry (1,500t) | 65 | 170 | 6.8E-3 |

Production processes include debarking, sawing, drying, sorting and packaging.

Construction process stage (A4-A5) includes:

A4 – Transport to the building site:

| Construction wood transport to building site | | | |
|--|------------------------------------|---------------|------------------------------|
| Type of transport and payload capacity | Capacity utilized incl. return (%) | Distance (km) | Diesel consumption (l/tonkm) |
| Truck (25t) | 61 | 70 | 2.2E-2 |

End of life stage (C1-C4) includes:

C2-C3 – Transportation and waste processing:

End of life includes two different scenarios. One assumes 100% collection with mixed construction waste for incineration of the products with energy recovery. The other scenario assumes 100% separate collection for recycling into particleboards. Neither of these scenarios are likely, but a mix is likely. The exact mix of incineration vs. recycling is unknown. Transport from building site to incineration assumes 100km transport and to recycling assumes a distance of 150km. There is no disposal in C4.

Benefits and loads beyond the system boundaries (D) includes:

For the incineration scenario, module D includes net impacts and benefits from avoided Danish average electricity production and thermal energy recovery.

For the recycling scenario, module D includes net impacts and benefits from avoided production of new residual wood shavings for particleboard production.

LCA results

| ENVIRONMENTAL IMPACTS PER M3 | | | | | | | | | |
|------------------------------|---|-----------------------|-----------|----------------------|----------------------|---------------------|-------------------|-------------------|------------------|
| Parameter | Unit | A1-A3 | A4 | C2 (incineration) | C3 (incineration) | D (incineration) | C2 (recycling) | C3 (recycling) | D (recycling) |
| GWP-fossil (range) | [kg CO ₂ -eq.] | 1.19E+02 (115-146) | 2.26E+00 | 4.06E+00 | 1.39E+01 | -3.95E+02 | 6.09E+00 | 2.46E+00 | -5.82E+01 |
| GWP | [kg CO ₂ -eq.] | -6.10E+02 | 2.26E+00 | 4.06E+00 | 7.43E+02 | -3.95E+02 | 6.09E+00 | 7.31E+02 | -7.87E+02 |
| ODP | [kg CFC11-eq.] | 1.41E-05 | 3.69E-16 | 6.72E-16 | 1.49E-13 | -2.92E-12 | 1.01E-15 | 8.98E-14 | -4.26E-06 |
| AP | [kg SO ₂ -eq.] | 5.55E-01 | 5.20E-03 | 1.03E-2 | 1.10E-01 | -2.69E-01 | 1.55E-02 | 3.16E-03 | -2.85E-01 |
| EP | [kg PO ₄ ³⁻ -eq.] | 1.82E-01 | 1.26E-03 | 2.50E-3 | 2.10E-02 | -5.36E-02 | 3.76E-03 | 5.90E-04 | -1.12E-01 |
| POCP | [kg ethene-eq.] | 3.03E-02 | -1.74E-03 | -3.59E-3 | 7.15E-03 | -3.17E-02 | -5.38E-03 | 2.99E-04 | -2.60E-02 |
| ADPE | [kg Sb-eq.] | 3.05E-04 | 1.59E-07 | 2.89E-07 | 1.92E-06 | -4.25E-05 | 4.34E-07 | 1.24E-06 | -1.43E-04 |
| ADPF | [MJ] | 1.75E+03 | 3.03E+01 | 5.51E+01 | 1.70E+02 | -6.10E+03 | 8.27E+01 | 2.37E+01 | -8.22E+02 |
| Caption | GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential of soil and water; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential for non fossil resources; ADPF = Abiotic depletion potential for fossil resources | | | | | | | | |

| RESOURCE USE PER M3 | | | | | | | | | |
|---------------------|---|----------|----------|----------------------|----------------------|---------------------|-------------------|-------------------|------------------|
| Parameter | Unit | A1-A3 | A4 | C2 (incineration) | C3 (incineration) | D (incineration) | C2 (recycling) | C3 (recycling) | D (recycling) |
| PERE | [MJ] | 5.13E+03 | 1.76E+00 | 3.21E+00 | 6.40E+01 | INA | 4.81E+00 | 5.56E+01 | INA |
| PERM | [MJ] | 6.79E+03 | 0 | 0 | 6.79E+03 | | 0 | 6.79E+03 | -6.79E+03 |
| PERT | [MJ] | 1.26E+04 | 1.76E+00 | 3.21E+00 | 6.86E+03 | INA | 4.81E+00 | 6.85E+03 | INA |
| PENRE | [MJ] | 1.22E+03 | 3.04E+01 | 5.53E+01 | 1.81E+02 | INA | 83 | 3.02E+01 | INA |
| PENRM | [MJ] | 3.20E+01 | 0 | 0 | 0 | INA | 0 | 0 | INA |
| PENRT | [MJ] | 2.22E+03 | 3.04E+01 | 5.53E+01 | 1.81E+02 | INA | 83 | 3.02E+01 | INA |
| SM | [kg] | 0.00E+00 | 0 | 0 | 0 | INA | 0 | 0 | INA |
| RSF | [MJ] | 0.00E+00 | 0 | 0 | 0 | INA | 0 | 0 | INA |
| NRSF | [MJ] | 0.00E+00 | 0 | 0 | 0 | INA | 0 | 0 | INA |
| FW | [m ³] | 1.68E+01 | 2.98E-03 | 5.43E-03 | 2.10E+00 | INA | 8.14E-03 | 2.77E-02 | INA |
| Caption | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Use of net fresh water | | | | | | | | |

| WASTE CATEGORIES AND OUTPUT FLOWS PER M3 | | | | | | | | | |
|--|------|----------|----------|----------------------|----------------------|---------------------|-------------------|-------------------|------------------|
| Parameter | Unit | A1-A3 | A4 | C2 (incineration) | C3 (incineration) | D (incineration) | C2 (recycling) | C3 (recycling) | D (recycling) |
| HWD | [kg] | 8.36E-02 | 1.70E-06 | 4.64E-06 | 5.24E-08 | -3.09E-06 | 4.64E-06 | 5.24E-08 | -3.09E-06 |
| NHWD | [kg] | 3.00E+00 | 2.47E-03 | 6.75E-03 | 1.15E-01 | -4.50E-03 | 6.75E-03 | 1.15E-01 | -4.50E-03 |
| RWD | [kg] | 1.03E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | |
|---------|---|-----|-----|---|----------|-----------|---|----------|-----------|
| CRU | [kg] | INA | INA | 0 | 0 | 0 | 0 | 0 | 0 |
| MFR | [kg] | INA | INA | 0 | 0 | 0 | 0 | 5.00E+02 | -5.00E+02 |
| MER | [kg] | INA | INA | 0 | 5.00E+02 | -5.00E+02 | 0 | 0 | 0 |
| EEE | [MJ] | INA | INA | 0 | 0 | 0 | 0 | 0 | 0 |
| EET | [MJ] | INA | INA | 0 | 0 | 0 | 0 | 0 | 0 |
| Caption | HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy | | | | | | | | |

Additional information


Indoor air

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

Soil and water

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

References

| | |
|--------------------------------------|--|
| Publisher |  http://www.epddanmark.dk |
| Programme operator | <p>Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup http://www.teknologisk.dk</p> |
| LCA-practitioner |  <p>FORCE Technology Applied Environmental Assessment Park Allé 345 DK-2605 Brøndby https://forcetechnology.com/da</p> |
| LCA software /background data | <p>GaBi ts database version 8.7 incl. databases + Ecoinvent 3</p> |
| 3rd party verifier | <p>David Althoff Palm, Ramboll Sweden AB</p> |

General programme instructions

Version 1.9
www.epddanmark.dk

EN 15804

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

EN 15942

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

ISO 14025

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

ISO 14040

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

ISO 14044

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

EN 16485:2014

DS/EN 16485:2014 – “Round and sawn timber – Environmental Product Declarations – Product category rules for wood and wood-based products for use in construction”

EN 14080:2013

DS/EN 14080:2013 – “ Timber structures – Glued laminated timber and glued solid timber - Requirements”