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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
H.C. Andersens Boulevard 18,
1553 København V
VAT no. 13513104



Programme operator

Danish Technological Institute
www.dti.dk



Programme

EPD Danmark
www.epddanmark.dk



Declared products

Cross Laminated Timber is a solid construction wood product consisting of bonded wood layer panels arranged at right angles to each other.

Production site

Multiple production sites throughout Austria and Germany.

Products use

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

Declared unit

1 m3 of average construction wood in various dimensions.

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Basis of calculation

This EPD is developed in accordance with the European standards EN 15804 and EN 16485.

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
<input type="checkbox"/> internal <input checked="" type="checkbox"/> external
Third party verifier:  <hr/> 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	87 ± 2
Moisture	12 ± 2
Adhesive	≤1

Wood from certified sources is used to produce the products.

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the general production of CLT wood products from multiple producers with multiple production sites throughout Austria and Germany for sale in Denmark. Production data is based on average EPD's for these products and the data collection is described in the background EPD's. 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

The products are covered by EN 1995-1-1:2007 usage classes 1 and 2.

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

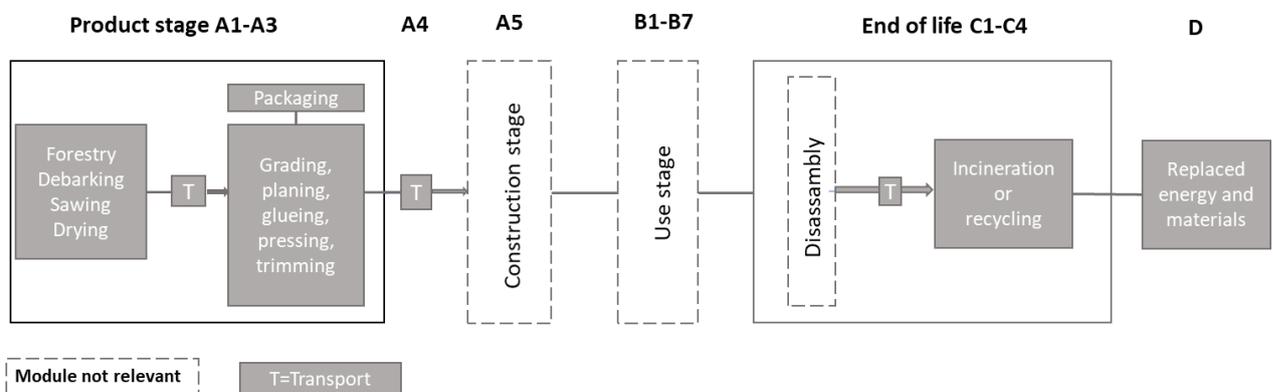
The LCI and LCIA results in this EPD relates to one cubic meter of general dried and sawn construction wood of varying dimensions.

Name	Value	Unit
Declared unit	1	m ³
Density	470	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 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.

Production processes include debarking, sawing, drying, grading, planing, glueing, pressing, trimming 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	1400	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 boundariies (D) includes:

For the incineration scenario, module D includes net impacts and benefits from avoided Danish average electricty 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	[kg CO ₂ -eq.]	6.70E+01	4.24E+01	3.82E+00	1.30E+01	-3.87E+02	5.73E+00	2.32E+00	-5.47E+01
GWP	[kg CO ₂ -eq.]	-6.64E+02	4.24E+01	3.82E+00	7.44E+02	-3.87E+02	5.73E+00	7.33E+02	-7.86E+02
ODP	[kg CFC11-eq.]	4.25E-06	6.94E-15	6.32E-16	1.40E-13	-2.86E-12	9.48E-16	8.44E-14	-4.01E-06
AP	[kg SO ₂ -eq.]	3.28E-01	9.78E-02	9.69E-03	1.03E-01	-2.64E-01	1.45E-02	2.97E-03	-2.68E-01
EP	[kg PO ₄ ³⁻ -eq.]	2.21E-01	2.36E-02	2.35E-03	1.97E-02	-5.25E-02	3.53E-03	5.55E-04	-1.06E-01
POCP	[kg ethene-eq.]	3.72E-02	-3.26E-02	-3.37E-03	6.72E-03	-3.10E-02	-5.06E-03	2.81E-04	-2.45E-02
ADPE	[kg Sb-eq.]	7.12E-05	2.99E-06	2.72E-07	1.81E-06	-4.16E-05	4.08E-07	1.16E-06	-1.35E-04
ADPF	[MJ]	1.20E+03	5.70E+02	5.18E+01	1.60E+02	-5.97E+03	7.78E+01	2.22E+01	-7.73E+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]	2.26E+03	3.32E+01	3.02E+00	6.01E+01	INA	4.53E+00	5.23E+01	INA
PERM	[MJ]	7.74E+03	0	0	-7.74E+03	7.74E+03	0	-7.74E+03	7.74E+03
PERT	[MJ]	1.00E+04	3.32E+01	3.02E+00	-7.68E+03	INA	4.53E+00	-7.69E+03	INA
PENRE	[MJ]	1.09E+03	5.72E+02	5.20E+01	1.70E+02	INA	7.80E+01	2.84E+01	INA
PENRM	[MJ]	2.22E+02	0	0	0	INA	0	0	INA
PENRT	[MJ]	1.31E+03	5.72E+02	5.20E+01	1.70E+02	INA	7.80E+01	2.84E+01	INA
SM	[kg]	0	0	0	0	INA	0	0	INA
RSF	[MJ]	0	0	0	0	INA	0	0	INA
NRSF	[MJ]	0	0	0	0	INA	0	0	INA
FW	[m ³]	1.05E+00	5.60E-02	5.10E-03	1.97E+00	INA	7.65E-03	2.60E-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]	5.31E-02	3.19E-05	2.91E-06	3.52E-07	-2.59E-06	4.36E-06	4.92E-08	-2.91E-06
NHWD	[kg]	5.51E-01	4.65E-02	4.23E-03	1.11E+01	-4.39E+00	6.34E-03	1.08E-01	-4.23E-03
RWD	[kg]	2.93E-02	0	0	0	0	0	0	0

CRU	[kg]	INA	INA	0	0	0	0	0	0
MFR	[kg]	INA	INA	0	4.70E+02	-4.70E+02	0	4.70E+02	-4.70E+02
MER	[kg]	INA	INA	0	0	0	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	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup http://www.teknologisk.dk
LCA-practitioner	 FORCE Technology Applied Environmental Assessment Park Allé 345 DK-2605 Brøndby https://forcetechnology.com/da
LCA software / background data	GaBi ts database version 8.7 incl. databases + Ecoinvent 3
3rd party verifier	David Althoff Palm, Ramboll Sweden AB

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 1995-1-1:2007

EN 1995-1-1:2007 – "Design of timber structures – Part 1-1: General – Common rules and rules for buildings"