epddanmark

ECO PLATFORM EPD VERIFIED

Owner: Lilleheden A/S
No.: MD-22038-EN
Issued: 04-07-2022
Valid to: 04-07-2027

3rd PARTY **VERIFIED**

EPD

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

Owner of declaration
Lilleheden A/S
Hovedvejen 114
DK-9850, Hirtshals
CVR: 24077713

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product
Glulam construction wood products of spruce

Number of declared datasets/product variations: 1

Production site
Lilleheden in Hirtshals, Denmark

Product 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/ functional unit
1 m^3 glulam construction wood in various dimensions.

Year of data
2021

EPD version
First version

Issued: 04-07-2022
Valid to: 04-07-2027

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.

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:

David Althoff Palm, Ramboll Sweden AB

Martha Katrine Sørensen
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	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

Product information

Product description

The main product components are shown in the table below.

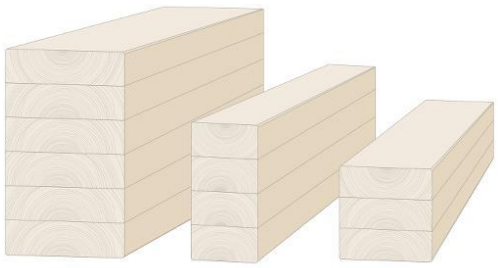
Material	Weight-% of declared product
Wood	86 ± 2
Moisture	12 ± 2
Adhesive	≤2

Wood from certified sources are used to produce the products.

Representativity

This declaration, including data collection, the modeled foreground system and results, represents a specific EPD for the production of glulam construction wood from Lilleheden in Hirtshals, Denmark. The timber primarily originates from Sweden. The end-of-life scenario is Danish. Production data was collected for the year 2021. Background data are based on the published EPD for the input wood "S-P-02537: Swedish sawn dried timber of spruce or pine" and on GaBi database version 2021.2 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.

Picture of product



Hazardous substances

The products do not contain substances listed in the "Candidate List of Substances of Very High Concern for authorisation".

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

Essential characteristics

The products are covered by EN 14080:2013. Declaration of performance and further technical information can be obtained by contacting the manufacturer or on the manufacturers website:

https://www.lilleheden.dk/

Reference Service Life (RSL)

No RSL is declared. This EPD does not include the use stage.

LCA background

Declared unit

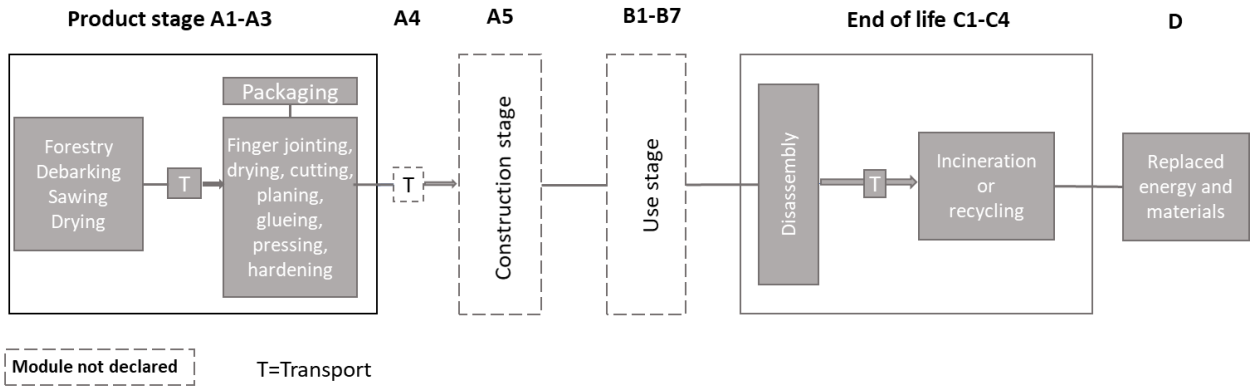
The LCI and LCIA results in this EPD relates to one m^3 glulam construction wood.

Name	Value	Unit
Declared unit	1	m^3
Density	430	kg/m^3
Conversion factor to 1 kg	0.0023	-

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804, and EN 16485.

Flowdiagram



System boundary

This EPD is based on a cradle-to-gate with modules C1-D 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

The product stage comprises the acquisition of Swedish 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, sorting and packaging.

Construction process stage (A4-A5) includes:

The construction process stage is not declared. However, the packaging is disposed of in module A5. Therefore, a scenario for the disposal of packaging is described.

End of Life (C1-C4) includes:

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 scenarion assumes 100% separate collection for recycling into particle boards. The exact mix of incineration vs. recycling is unknown.

Transport from building site to incineration assumes 100 km transport and to recycling assumes a distance of 150 km.

There is no disposal in C4.

Re-use, recovery and recycling potential (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 particle board production.

LCA results

ENVIRONMENTAL IMPACTS PER m^3										
Parameter	**Unit**	**A1-A3**	**C1**	**C2 (incineration)**	**C3 (incineration)**	**C4**	**D (incineration)**	**C2 (recycling)**	**C3 (recycling)**	**D (recycling)**
GWP-total	[kg CO_2 eq.]	-5,56E+02	0,00E+00	2,57E+00	6,91E+02	0,00E+00	-3,57E+02	3,86E+00	6,82E+02	-7,24E+02
GWP-fossil	[kg CO_2 eq.]	1,22E+02	0,00E+00	2,56E+00	1,24E+01	0,00E+00	-3,57E+02	3,84E+00	2,11E+00	-4,41E+01
GWP-biogenic	[kg CO_2 eq.]	-6,78E+02	0,00E+00	2,72E-02	6,78E+02	0,00E+00	-3,23E-01	4,08E-02	6,80E+02	-6,80E+02
GWP-luluc	[kg CO_2 eq.]	5,27E-01	0,00E+00	2,09E-02	1,04E-02	0,00E+00	-1,78E-01	3,14E-02	5,15E-03	-2,40E-01
ODP	[kg CFC 11 eq.]	1,10E-05	0,00E+00	3,26E-16	1,08E-13	0,00E+00	-2,34E-12	4,89E-16	6,89E-14	-2,91E-06
AP	[mol H^+ eq.]	7,34E-01	0,00E+00	8,22E-03	1,41E-01	0,00E+00	-2,75E-01	1,23E-02	3,68E-03	-2,64E-01
EP-freshwater	[kg P eq.]	1,56E-02	0,00E+00	7,58E-06	2,29E-05	0,00E+00	-4,47E-04	1,14E-05	1,31E-05	-1,65E-02
EP-marine	[kg N eq.]	2,59E-01	0,00E+00	3,79E-03	3,55E-02	0,00E+00	-1,07E-01	5,69E-03	1,24E-03	-7,45E-02
EP-terrestrial	[mol N eq.]	2,92E+00	0,00E+00	4,24E-02	6,06E-01	0,00E+00	-1,13E+00	6,35E-02	1,21E-02	-8,02E-01
POCP	[kg NMVOC eq.]	7,22E-01	0,00E+00	7,40E-03	9,42E-02	0,00E+00	-2,90E-01	1,11E-02	2,98E-03	-2,33E-01
ADPm[1]	[kg Sb eq.]	1,62E-03	0,00E+00	1,94E-07	1,68E-06	0,00E+00	-3,72E-05	2,91E-07	1,05E-06	-9,25E-05
ADPf[1]	[MJ]	2,13E+03	0,00E+00	3,40E+01	1,56E+02	0,00E+00	-5,64E+03	5,10E+01	2,55E+01	-6,60E+02
WDP[1]	[m^3 world eq. deprived]	5,05E+01	0,00E+00	2,22E-02	7,66E+01	0,00E+00	-6,81E+00	3,32E-02	1,99E-01	-1,05E+01
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 = 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^3							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	ND	ND	ND	ND	ND	ND
IRP[2]	[kBq U235 eq.]	ND	ND	ND	ND	ND	ND
ETP-fw[1]	[CTUe]	ND	ND	ND	ND	ND	ND
HTP-c[1]	[CTUh]	ND	ND	ND	ND	ND	ND
HTP-nc[1]	[CTUh]	ND	ND	ND	ND	ND	ND
SQP[1]	-	ND	ND	ND	ND	ND	ND
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)						
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 m³										
Parameter	**Unit**	**A1-A3**	**C1**	**C2 (incineration)**	**C3 (incineration)**	**C4**	**D (incineration)**	**C2 (recycling)**	**C3 (recycling)**	**D (recycling)**
PERE	[MJ]	1,44E+04	0,00E+00	1,90E+00	5,96E+01	0,00E+00	-1,74E+03	2,84E+00	5,14E+01	-4,44E+03
PERM	[MJ]	7,31E+03	0,00E+00	0,00E+00	-7,31E+03	0,00E+00	0,00E+00	0,00E+00	-7,31E+03	7,31E+03
PERT	[MJ]	2,17E+04	0,00E+00	1,90E+00	-7,25E+03	0,00E+00	-1,74E+03	2,84E+00	-7,26E+03	2,87E+03
PENRE	[MJ]	2,16E+03	0,00E+00	3,40E+01	1,56E+02	0,00E+00	-5,64E+03	5,10E+01	2,55E+01	-6,60E+02
PENRM	[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
PENRT	[MJ]	2,16E+03	0,00E+00	3,40E+01	1,56E+02	0,00E+00	-5,64E+03	5,10E+01	2,55E+01	-6,61E+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	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	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
FW	[m³]	1,70E+00	0,00E+00	2,17E-03	1,80E+00	0,00E+00	-7,23E-01	3,26E-03	2,12E-02	-2,45E-01
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 m³										
Parameter	**Unit**	**A1-A3**	**C1**	**C2 (incineration)**	**C3 (incineration)**	**C4**	**D (incineration)**	**C2 (recycling)**	**C3 (recycling)**	**D (recycling)**
HWD	[kg]	1,15E-01	0,00E+00	1,71E-09	6,36E-08	0,00E+00	-2,11E-06	2,57E-09	5,16E-08	-1,71E-09
NHWD	[kg]	2,93E+01	0,00E+00	5,05E-03	1,01E+01	0,00E+00	-4,11E+00	7,58E-03	4,30E+02	-5,05E-03
RWD	[kg]	3,26E-02	0,00E+00	4,12E-05	3,44E-03	0,00E+00	-7,74E-02	6,17E-05	2,28E-03	-4,12E-05
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
MFR	[kg]	4,12E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,30E+02	0,00E+00	0,00E+00
MER	[kg]	2,75E+00	0,00E+00	0,00E+00	4,30E+02	0,00E+00	0,00E+00	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
EET	[MJ]	3,54E+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
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; EE = Exported energy									

BIOGENIC CARBON CONTENT PER m³		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	185
Biogenic carbon content in accompanying packagaing	[kg C]	0
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information

Technical information on scenarios

Installation of the product in the building (A5)

Scenario information	Value	Unit
Plasltic packaging for recycling	0.94	kg

End of life (C1-C4)

Scenario information	Value	Unit
Collected with mixed waste (incineration scenario)	1	m^3
For energy recovery (incineration scenario)	1	m^3
Collected separately (recycling scenario)	1	m^3
For recycling (recycling scenario)	1	m^3

Re-use, recovery and recycling potential (D)

Scenario information/Materiel	Value	Unit
Replaced DK electricity from the grid (incineration scenario)	1.05E03	MJ
Replaced thermal energy from natural gas (incineration scenario)	4.62E03	MJ
Replaced residual wood (recycling scenario)	0.69	m^3

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	www.epddanmark.dk
Programme operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	FORCE Technology Applied Environmental Assessment Park Allé 345 DK-2605 Brøndby www.forcetechnology.com
LCA software /background data	GaBi database version 10.6.0.110 incl. Database version 2021.2
3rd party verifier	David Althoff Palm, Ramboll Sweden AB

General programme instructions
Version 2.0
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"

EN16485:2014
EN16485:2014 "Round and sawn timber – Environmental Product Declarations – 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”