Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A1:2013 for:

Glued laminated timber beams

from

ZAZA TIMBER Production, Ltd

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-04453
Version	V1
Publication date:	2021-10-06
Valid until:	2026-10-06
Geographical scope	Latvia, Norway, Sweden

Programme information

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com

Product category rules (PCR): PCR 2012:01 Construction products and construction services (EN 15804:A1) (2.33) Sub PCR: SUB-PCR TO PCR 2012:01, Wood and wood-based products for use in construction (EN 16485:2014)
PCR review was conducted by: The Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via info@environdec.com.
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: Marcel Gómez Ferrer Marcel Gómez Consultoria Ambiental Email: info@marcelgomez.com Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.

Differences versus previous versions of the EPD

This is the first version of the EPD.

Company information

Owner of the EPD		
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Description of the organisation:

ZAZA TIMBER Production, Ltd is a research centre for large-sized timber structures: components of timber bridges, bearing structures, etc... It activities are organized between to industrial research and experimental production. The company conducts researches, to create Latvian products with high export capacity, develops prototypes (project developing, designing) and finally, tests the new timber components.
For additional information about ZAZA TIMBER Production, Ltd please visit the company web site at http://www.zazatimber.lv/.

Name and location of production site: ZAZA TIMBER Production, Ltd production plant: Jelgavas nov., Cenu pag., Raubēni, Rubeņu ceļš 46 Latvia

Product information

Product name:

- Glued laminated timber beam from spruce
- Treated glued laminated timber beam from pine

Geographical scope: Norway, Sweden and Latvia.

UN CPC code: 311-312 Products of wood, cork, straw and plaiting materials

Product description: ZAZA TIMBER PRODUCTION, Ltd products are glued laminated wooden beam (PUR and MUF glues). They are used in several areas of large-sized timber structures. Products have different characteristics corresponding to different applications as house construction or bridges.

Physical characteristic and applications:

	Glued laminated timber beam from spruce	Treated glued laminated timber beam from pine
Application	Bridges and building timber structures	Bridges and building timber structures
Release of formaldehyde	Formaldehyde release class E1 according to the standard EN 14080	Formaldehyde release class E1 according to the standard EN 14080
Characteristics	• From spruce • Untreated	• From pine • Creosote and Tanalith E impregnated
Density (kg/m3)	440	450
Moisture content (%)	12+/-2	14+/-2
Reaction to fire (EN 13501-1)	D-s2, d0	D-s2, d0

LCA information

Declared unit: The declared units are:

- one cubic metre (1 m3) of glued laminated timber beam from spruce with a density of 440 kg/m^3 and a delivery moisture content of 12%, ready to be used in bridges and building timber structures
- one cubic metre (1 m3) of treated glued laminated timber beam from pine with a density of 450 kg/m^3 and a delivery moisture content of 14% ready to be used in bridges and building timber structures

Reference service life: Wood is a very resistant material. It is complex to exactly establish the service life of the product. The ZAZA TIMBER Production, Ltd laminated timber beams are designed to overcome the building service life hence a 100 year period of service life has been estimated for these products.

Time representativeness: Data were collected by ZAZA TIMBER Production, Ltd and are representative of 2020 manufacturing technologies.

Database(s) and LCA software used: Database used is mainly Ecoinvent 3.6 Allocation, cut-off by classification. Only one data (PU glue) has been modelled with the CODDE-2020-12 database. The software used is EIME V5.9.1.
Environmental indicators calculated according to EN 15804+A1 (CML-IA version 4.1, baseline)

Description of system boundaries: Type of EPD: cradle to grave, with options
The following life cycle stages are taken into account in the analysis:

- Product stage A1-A3
- Transport stage A4
- End of life stage C2-C4

- Benefits and loads beyond the system boundary D

As installation process and maintenance operations can differ among the application, modules A5, B1-B7 and C1 have not been included.

An allocation based in mass has been done where necessary.

Cut-off criteria: Flows that can be excluded from the study because of the difficulty of attributing them to a particular reference flow are the following:

- The lighting, heating, sanitation and cleaning of facilities
- The transportation of employees and the staff catering facilities.
- The manufacture and maintenance of production tools and infrastructures
- Flows from R&D, administrative, management, and marketing poles.

The proportion of non-modelled elements is in compliance with the 1 % of renewable and non-renewable primary energy usage and the 1%-in-weight cut-off rule over the life-cycle considered. The total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass.
Modularity principle and polluter pays principle have been applied in the study.

Description of system boundaries

Life Cycle Stages																
Building life-cycle information																Benefits and loads beyond the system boundary
Upstream processes	Core processes		Downstream processes													Other environmental information
Raw material supply	Transport	Manufacturing	Transport	Construction - installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction - demolition	Transport	Waste processing	Disposal	Reuse - Recovery - Recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
✓			✓	MND	MND	MND	MND	MND	MND	MND	MND	MND	✓	✓	✓	✓

- **Product stage**
  - **A1 - Raw material supply: extraction and processing of raw materials.**

Generation of electricity, steam and heat from primary energy resources, also including their extraction, refining and transport. This also includes energy needed for raw material supply and energy for manufacturing in core process.

  - **A2 - Transportation: external transportation to the manufacturing plant and internal transport**
  - **A3 - Manufacturing:**
    - The recycling process of any purchased recycled material and the transport from the recycling process to where the material is used.
    - Manufacturing of the construction product.
    - Packing materials etc. used.
    - Production of ancillary materials or pre-products;

- **Transport stage**:
  - **A4 – transport of construction products to the building site**

- **End of life stage**
  - **C2 – transport to the treatment site**
  - **C3 – waste processing for reuse, recovery or recycling**
  - **C4 – final disposal of end-of-life construction product**

- **Benefits and loads beyond the system boundary**
  - **D – Reuse/recovery/recycling potential evaluated as net impacts and benefits**

LCA Assumptions

Distribution stage

PARAMETER	Glued laminated timber beam from spruce	Treated glued laminated timber beam from pine
Fuel type and consumption of vehicle or vehicle type used for transport	Average truck trailer with a 16-32t payload, fuel consumption : 22kg/100km Transoceanic container ship for boat transport	
Distance	• **Oslo, Norway (70%):** 3 km by lorry + 1317 km by container • **Riga, Latvia (15%):** 100 km by lorry • **Alta, Norway (10%):** 80km by lorry + 3070 km by container • **Ostersund, Sweden (5%):** 87 km by lorry + 726 km by container	• **Oslo, Norway (70%):** 3 km by lorry + 1317 km by container • **Alta, Norway (20%):** 80km by lorry + 3070 km by container • **Riga, Latvia (10%):** 100 km by lorry
Capacity utilisation (including empty returns)	36% of the capacity in volume % included in the database	
Bulk density of transported products*	440kg/m3	450kg/m3
Volume capacity utilisation factor	1	1

End of life stage

Parameter	Glued laminated timber beam from spruce	Treated glued laminated timber beam from pine
Collection process specified by type	100% collected with mixed construction waste	
Recovery system specified by type	85% incineration with energy recovery	90% incineration with energy recovery
Disposal specified by type	15% incineration without energy recovery	10% incineration without energy recovery
Assumptions for scenario development (e.g. transportation)	• Wood transportation on 400 km • Wood sorting and shredding • Incineration with energy recovery for waste wood chip incinerated in Sweden and Norway (energy recovery > 60% among PEF data) • Incineration without energy recovery for waste wood chip incinerated in Latvia (energy recovery < 60% among PEF data)	

Module D

This module takes into account the benefits and loads beyond the system boundary. Hence module D included de benefits related to the recovery of thermal and electric energy generated by the wood combustion (with an efficiency of 60%). It allows to replace electricity and heat generation from conventional by way.

Content declaration

Product

Product references	Constituent materials					
	Wood	Resin	Paraffin	Glue	Creosote	Tanalith E
Glued laminated timber beam from spruce	94,54%	3,25%	0,79%	1,52%	-	-
	During the life cycle of this product no substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" has been used in a percentage higher than 0.1% of the weight of the product.					
Treated glued laminated timber beam from pine	90,04%	2,80%	0,68%	1,48%	5,07%	<1%
	During the life cycle of this product one substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" has been used: creosote (CAS : 8001-58-9), 5,07% of the weight of the product.					

Packaging

Distribution packaging: plastic polyester, iron clips and cardboard
700g of packaging for the glued laminated timber beam from spruce
200g of packaging for the treated glued laminated timber beam from pine

Recycled material

Provenience of recycled materials (pre-consumer or post-consumer) in the product: There is no recycled material on the product.

Environmental performance

The results of the LCIA are relative expressions and does not predict final impact categories, the exceeding of thresholds, safety margins or risks.

Glued laminated timber beam from spruce and pine

Potential environmental impact

PARAMETER		UNIT	A1-A3	A4	C2	C3	C4	Total without D	D	A5-C1
Global warming potential (GWP)	Fossil	kg CO_2 eq.	2,96E+02	7,27E+00	2,88E+01	1,17E+01	0,00E+00	3,44E+02	-1,30E+02	MND
	Biogenic	kg CO_2 eq.	-6,67E+02	0,00E+00	0,00E+00	6,67E+02	0,00E+00	-2,00E-01	0,00E+00	MND
	TOTAL	kg CO_2 eq.	-3,71E+02	7,27E+00	2,88E+01	6,79E+02	0,00E+00	3,44E+02	-1,30E+02	MND
Depletion potential of the stratospheric ozone layer (ODP)		kg CFC 11 eq.	3,78E-05	1,23E-06	5,31E-06	9,11E-07	0,00E+00	4,52E-05	-3,38E-06	MND
Acidification potential (AP)		kg SO_2 eq.	1,59E+00	1,44E-01	9,38E-02	8,23E-02	0,00E+00	1,91E+00	-3,72E-01	MND
Eutrophication potential (EP)		kg PO_4^{3-} eq.	8,54E-01	1,69E-02	2,14E-02	6,53E-02	0,00E+00	9,57E-01	-9,73E-02	MND
Formation potential of tropospheric ozone (POCP)		kg C_2H_4 eq.	1,29E-01	3,67E-03	3,69E-03	2,71E-03	0,00E+00	1,39E-01	-1,53E-02	MND
Abiotic depletion potential – Elements		kg Sb eq.	4,77E-03	9,77E-05	7,95E-04	1,10E-04	0,00E+00	5,77E-03	-1,11E-03	MND
Abiotic depletion potential – Fossil resources		MJ, net calorific value	5,10E+03	9,79E+01	4,33E+02	1,44E+02	0,00E+00	5,77E+03	-3,87E+02	MND

Use of resources

PARAMETER		UNIT	A1-A3	A4	C2	C3	C4	Total without D	D	A5-C1
Primary energy resources – Renewable	Use as energy carrier	MJ	4,87E+03	1,02E+00	7,00E+00	6,74E+03	0,00E+00	1,16E+04	-8,31E+02	MND
	Used as raw materials	MJ	6,73E+03	0,00E+00	0,00E+00	-6,73E+03	0,00E+00	-1,00E-01	0,00E+00	MND
	TOTAL	MJ	1,16E+04	1,02E+00	7,00E+00	1,15E+01	0,00E+00	1,16E+04	-8,31E+02	MND
Primary energy resources – Non-renewable	Use as energy carrier	MJ	4,67E+03	9,96E+01	4,43E+02	1,57E+02	0,00E+00	5,37E+03	4,43E+02	MND
	Used as raw materials	MJ	8,08E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,08E+02	0,00E+00	MND
	TOTAL	MJ	5,48E+03	9,96E+01	4,43E+02	1,57E+02	0,00E+00	6,18E+03	4,43E+02	MND
Secondary material		kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND
Renewable secondary fuels		MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND
Non-renewable secondary fuels		MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND
Net use of fresh water		m^3	4,29E+00	6,93E-03	4,66E-02	1,26E-01	0,00E+00	4,47E+00	4,66E-02	MND

Waste production and output flows

Waste production

PARAMETER	UNIT	A1-A3	A4	C2	C3	C4	Total without D	D	A5-C1
Hazardous waste disposed	kg	2,53E-02	1,47E-04	1,16E-03	9,64E-04	0,00E+00	2,75E-02	-8,84E-04	MND
Non-hazardous waste disposed	kg	5,61E+01	1,71E+00	2,11E+01	5,32E+00	0,00E+00	8,42E+01	-1,42E+01	MND
Radioactive waste disposed	kg	3,33E-02	6,89E-04	3,02E-03	5,41E-04	0,00E+00	3,75E-02	-3,47E-03	MND

Output flows

PARAMETER	UNIT	A1-A3	A4	C2	C3	C4	Total without D	D	A5-C1
Components for reuse	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND
Material for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	3,74E+02	0,00E+00	3,74E+02	0,00E+00	MND
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	4,02E+03	0,00E+00	4,02E+03	0,00E+00	MND

Treated glued laminated timber beam from pine

Potential environmental impact

PARAMETER		UNIT	A1-A3	A4	C2	C3	C4	Total without D	D	A5-C1
Global warming potential (GWP)	Fossil	kg CO_2 eq.	3,74E+02	8,45E+00	2,94E+01	1,02E+01	0,00E+00	4,22E+02	-1,21E+02	MND
	Biogenic	kg CO_2 eq.	-5,45E+02	0,00E+00	0,00E+00	5,45E+02	0,00E+00	0,00E+00	0,00E+00	MND
	TOTAL	kg CO_2 eq.	-1,71E+02	8,45E+00	2,94E+01	5,55E+02	0,00E+00	4,22E+02	-1,21E+02	MND
Depletion potential of the stratospheric ozone layer (ODP)		kg CFC 11 eq.	5,17E-05	1,42E-06	5,43E-06	8,24E-07	0,00E+00	5,94E-05	-3,26E-06	MND
Acidification potential (AP)		kg SO_2 eq.	2,06E+00	1,76E-01	9,60E-02	7,82E-02	0,00E+00	2,41E+00	-3,40E-01	MND
Eutrophication potential (EP)		kg PO_4^{3-} eq.	1,03E+00	2,05E-02	2,19E-02	6,42E-02	0,00E+00	1,14E+00	-9,00E-02	MND
Formation potential of tropospheric ozone (POCP)		kg C_2H_4 eq.	1,49E-01	4,48E-03	3,77E-03	2,54E-03	0,00E+00	1,60E-01	-1,37E-02	MND
Abiotic depletion potential – Elements		kg Sb eq.	7,55E-03	1,06E-04	8,13E-04	9,51E-05	0,00E+00	8,56E-03	-1,05E-03	MND
Abiotic depletion potential – Fossil resources		MJ, net calorific value	6,91E+03	1,13E+02	4,43E+02	1,27E+02	0,00E+00	7,59E+03	-3,61E+02	MND

Use of resources

PARAMETER		UNIT	A1-A3	A4	C2	C3	C4	Total without D	D	A5-C1
Primary energy resources – Renewable	Use as energy carrier	MJ	4,40E+03	1,12E+00	7,16E+00	5,51E+03	0,00E+00	9,91E+03	-8,38E+02	MND
	Used as raw materials	MJ	5,50E+03	0,00E+00	0,00E+00	-5,50E+03	0,00E+00	1,00E-01	0,00E+00	MND
	TOTAL	MJ	9,90E+03	1,12E+00	7,16E+00	9,78E+00	0,00E+00	9,91E+03	-8,38E+02	MND
Primary energy resources – Non-renewable	Use as energy carrier	MJ	6,26E+03	1,15E+02	4,53E+02	1,38E+02	0,00E+00	6,97E+03	-4,33E+02	MND
	Used as raw materials	MJ	1,01E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,01E+03	0,00E+00	MND
	TOTAL	MJ	7,28E+03	1,15E+02	4,53E+02	1,38E+02	0,00E+00	7,98E+03	-4,33E+02	MND
Secondary material		kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND
Renewable secondary fuels		MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND
Non-renewable secondary fuels		MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND
Net use of fresh water		m^3	4,53E+00	7,68E-03	4,76E-02	1,23E-01	0,00E+00	4,70E+00	-4,38E+00	MND

Waste production and output flows

Waste production

PARAMETER	UNIT	A1-A3	A4	C2	C3	C4	Total without D	D	A5-C1
Hazardous waste disposed	kg	2,70E-02	1,59E-04	1,19E-03	9,66E-04	0,00E+00	2,93E-02	-8,65E-04	MND
Non-hazardous waste disposed	kg	9,51E+01	1,71E+00	2,16E+01	5,05E+00	0,00E+00	1,23E+02	-1,47E+01	MND
Radioactive waste disposed	kg	4,20E-02	7,96E-04	3,08E-03	4,67E-04	0,00E+00	4,64E-02	-3,42E-03	MND

Output flows

PARAMETER	UNIT	A1-A3	A4	C2	C3	C4	Total without D	D	A5-C1
Components for reuse	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND
Material for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	4,05E+02	0,00E+00	4,05E+02	0,00E+00	MND
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	4,04E+03	0,00E+00	4,04E+03	0,00E+00	MND

References

EIME software, Version 5.9.1 – database : Ecoinvent 3.6 Allocation, cut-off by classification

EIME v5 guides1 2: for the modelling of the different processes

General programme instructions for the international EPD® system (v.2.5)

NF EN 15804+A1: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction

PCR2012:01 Construction products and construction services V2.33

SUB-PCR TO PCR 2012:01, Wood and wood-based products for use in construction (EN 16485:2014)

NF EN 16485: Round and sawn timber – Environmental Product Declarations – Product category rules for wood and wood-based products for use in construction (2014)

ISO 14040: Environmental management -- Life cycle assessment -- Principles and framework (2006)

ISO 14025: Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures (2006)

LIFE CYCLE ASSESSMENT REPORT, Glued laminated timber beams (2021)

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EPD®

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