ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

GLULAM

PINSKA LIIMPUIT OÜ

GENERAL INFORMATION

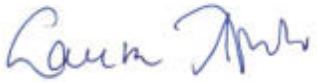
MANUFACTURER INFORMATION

Manufacturer	Pinska Liimpuit OÜ
Address	Viljandi maakond, Viljandi vald, Mäeltküla, Abrami saeveski, 70105
Contact details	glulam@pinska.ee
Website	pinska.ee

The Building Information Foundation RTS sr

EPDs within the same product category but from different programmes may not be comparable.

Jukka Seppänen
RTS EPD Committee Secretary



Laura Apilo
Managing Director

EPD INFORMATION

The EPD owner has the sole ownership, liability, and responsibility for the EPD. Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	The Building Information Foundation RTS sr
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804 serves as the core PCR. In addition, the RTS PCR (English version, 26.8.2020) and EN 16485 is used.
EPD author	Mari Kirss and Anni Oviir Rangi Maja OÜ www.lcasupport.com
EPD verification	Independent verification of this EPD and data, according to ISO 14025:2010: ☐ Internal ☑ External
Verification date	23 May 2023
EPD verifier	Sigita Židonienė Vesta Consulting UAB www.vestaconsulting.lt
EPD number	RTS_237_23
Publishing date	07.06.2023
EPD valid until	07.06.2028

PRODUCT INFORMATION

Product name	Glulam
Place(s) of production	Estonia

PRODUCT DESCRIPTION

Pinska Liimpuit OÜ produces homogeneous laminated glulam, combined laminated glulam, homogeneous finger-jointed laminated glulam, and combined finger-jointed laminated glulam.

Glulam consists of two components: sawn wood and adhesive. The sawn wood is spruce and makes up 99% (by weight) of the glulam. Adhesives used by Pinska Liimpuit consist of mainly MUF (melamine urea formaldehyde) with small amounts of PUR (polyurethane). 99% of the wood used has FSC or PEFC certification.

PRODUCT APPLICATION

Glulam is used as load-bearing material in trusses, rafters, bridges, in building construtions etc.

TECHNICAL SPECIFICATIONS

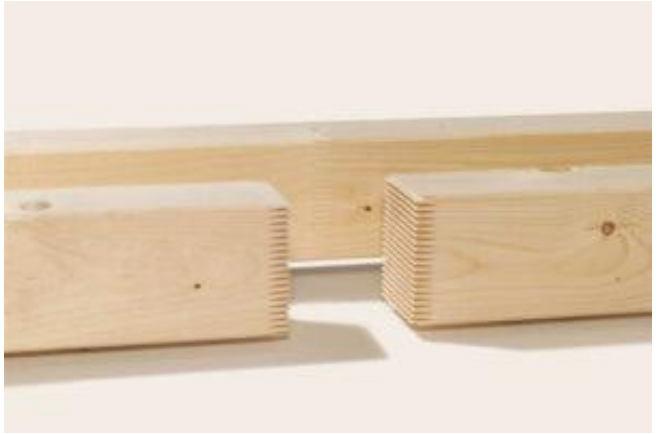
Glued laminated timber is produced in strength classes GL24, GL28, GL30 and GL32.

PRODUCT STANDARDS

The glulam is produced from planed and strength-graded material with the strength classes C18 and C24, C30, C40 which correspond to the requirements of the standard EN 14081-1 valid in Estonia.

PHYSICAL PROPERTIES AND ADDITIONAL TECHNICAL INFORMATION

Further information can be found at pinska.ee



PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	White EPS
Wood	99%, Europe
Glue	1%, Europe

Raw material category	Amount, mass- % and material origin
Metals	-
Minerals	-
Fossil materials	1%, Europe
Bio-based materials	99%, Europe

Biogenic carbon content	kg C per declared unit
Biogenic carbon content in product	205 kg
Biogenic carbon content in packaging	0 kg
Note. 1 kg biogenic carbon is equivalent to 44/12 kg of biogenic CO2and has been calculated based on EN 16449.	

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0.1 % (1000 ppm).

ABOUT THE MANUFACTURER

OÜ Pinska, founded in 1999, has developed over the years from a small sawmill to a complex of companies with the aim of further wood refining. OÜ Pinska is a company based on Estonian capital. It is focused on the production of pine and spruce lumber and planing material. In addition, Pinska OÜ produces outside boards, wooden panels, frame houses and since 2011, glued laminated timber.

PRODUCT LIFE-CYCLE

AND LIFE-CYCLE ASSESSMENT

Period for data	2021
Declared unit	1 m3
Mass per declared unit	475 kg

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and the applied PCR. The study does not exclude any hazardous materials or substances.

The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The data sources for the study are Ecoinvent 3.8 (2021). The tools used for the study were One Click LCA and Open LCA.

SYSTEM BOUNDARY

The scope of the EPD is cradle to gate, modules C1–C4 and module D.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x	x	x
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

MANUFACTURING AND PACKAGING (A1-A3)

The manufacturing process starts with the controlled and accepted timber entering the production. The individual layers of the laminated glued timber can either consist of single whole lamellas or finger-jointed pieces. In case of the latter, the process of finger-jointing involves cutting a set of complementary, interlocking profiles on each of the timber pieces which are then joined by gluing. Once the lamellas have been created or chosen, they go through a planer, which ensures a smooth wood surface for the maximum gluing effectiveness. The glue-covered lamellas are stacked directly on the gluing press. After pressing, the beam goes through a final planing in order to remove the excess glue and any structural unevenness. Finally, the beam is cut into specifically requested or simply rectangular shape. The final product is packaged and shipped to the client by trucks and/or ships.

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials.

Vehicle capacity utilization volume factor is assumed to be 1, which means full load. In reality, it may vary but as role of transportation emission in total results is small and so the variety in load is assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by transportation company to serve the needs of other clients.

Fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. All fuel and energy use was allocated based on production volume. The electricity used in the plant is grid energy and this has been modelled based on Estonian residual mix for 2020-2021. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission. Economic co-product allocation has been used.

The Products are packaged using plastic film. The mass of the packaging is 1.15 kg per declared unit.

Scenario parameter	Value
Electricity data source and quality	Modelled electricity based on Estonian residual mix for 2020-2021
Electricity CO_2e / kWh	0.6

TRANSPORT AND INSTALLATION (A4-A5)

A4 and A5 have not been declared.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

EOL scenarios have been based on EU waste management data from 2017-2021 and are representative of Europe.

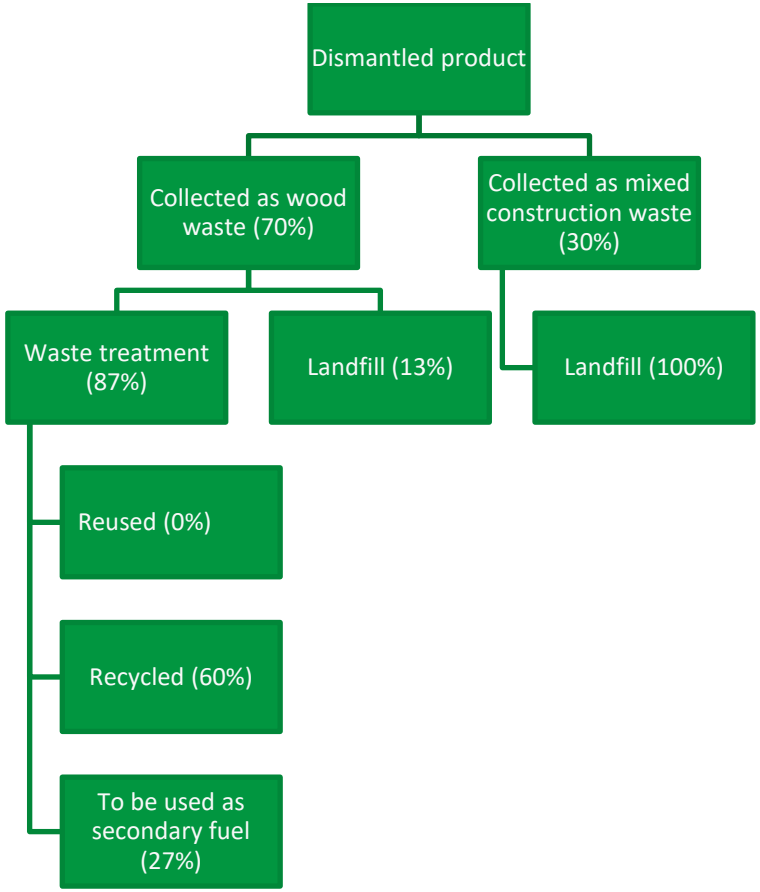
It is assumed that 70% of the Products is collected as sorted wood waste and the rest as general construction and demolition waste. Demolition is assumed to require 38 MJ per 1 m3 demolished.

Sorted wood waste is sent to waste treatment facilites and mixed waste is sent to landfill. It is assumed that the dismantled product is transported 250 km by lorry.

87% of the sorted wood waste is then recycled into chipboard (60%) or processed into wood chips to be used as secondary fuel (27%). The remaining 13% is landfilled.

All biogenic carbon stored in the product is assumed to be released in C3 and C4.

In total, 42% of the dismantled product is recycled, 19% is processed to be used as secondary fuel and 39% is landfilled.



Any material that left the product system in C3 has been considered in module D. It is assumed the recycled wood chips are used to produce chipboard.

The heat and electricity produced as benefit when waste Product is used as secondary fuel is considered. The efficiency rate for incineration is 73% (62% us used to produce electricity and 11% to produce heat).

Waste packaging from A5 has not been considered.

Module D includes an additonal load for non-certified wood materials as energy recovery for this kind of material cannot be allocated as carbon neutral.

Module D scenario is representative of Europe.

Scenario parameter	Glulam
Collection process – kg collected separately	332.50
Collection process – kg collected with mixed waste	142.5
Recovery process – kg for re-use	0.00
Recovery process – kg for recycling	199.50
Recovery process – kg for energy recovery	89.78
Disposal (total) – kg for final deposition	185.725
Scenario assumptions e.g. transportation	End-of-life product is transported 250 km with an average lorry.

ENVIRONMENTAL IMPACTS – CORE INDICATORS, EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Global warming potential – total	kg CO_2e	-9.16E+02	2.06E+01	3.21E+02	-5.75E+02	4.51E+01	2.02E+01	4.70E+02	2.96E+02	-3.51E+02
Global warming potential – fossil	kg CO_2e	8.46E+01	2.06E+01	5.20E+01	1.57E+02	4.51E+01	2.02E+01	1.30E+01	2.04E+00	-3.58E+02
Global warming potential – biogenic	kg CO_2e	-1.00E+03	0.00E+00	2.66E+02	-7.36E+02	0.00E+00	0.00E+00	4.53E+02	2.91E+02	0.00E+00
Global warming potential – LULUC	kg CO_2e	1.12E+00	7.89E-03	2.73E+00	3.86E+00	4.51E-03	7.72E-03	4.64E+00	2.94E+00	7.45E+00
Ozone depletion pot.	kg CFC_{-11}e	1.19E-05	4.60E-06	1.83E-06	1.83E-05	9.71E-06	4.51E-06	1.91E-06	5.94E-07	-3.37E-05
Acidification potential	mol H^+e	6.34E-01	8.31E-02	3.11E-01	1.03E+00	4.65E-01	7.96E-02	7.52E-02	1.69E-02	-6.01E-01
Eutrophication potential - freshwater	kg Pe	1.06E-02	1.45E-04	1.95E-03	1.27E-02	1.50E-04	1.43E-04	3.47E-04	3.90E-05	-1.26E-03
Eutrophication potential - marine	kg Ne	2.11E-01	2.47E-02	4.47E-02	2.81E-01	2.05E-01	2.38E-02	2.40E-02	1.11E-02	-1.31E-01
Eutrophication potential - terrestrial	mol Ne	2.28E+00	2.72E-01	4.84E-01	3.04E+00	2.33E+00	2.61E-01	2.60E-01	6.31E-02	-1.43E+00
Photochemical ozone formation (“smog”)	kg NMVOCe	8.49E-01	8.37E-02	1.42E-01	1.07E+00	6.29E-01	8.08E-02	7.52E-02	2.23E-02	-4.93E-01
Abiotic depletion potential - minerals & metals	kg Sbe	5.05E-04	7.13E-05	1.22E-04	6.98E-04	2.33E-05	7.01E-05	4.05E-05	6.69E-06	-2.06E-04
Abiotic depletion potential - fossil resources	MJ	1.36E+03	2.99E+02	9.59E+02	2.62E+03	6.09E+02	2.93E+02	1.85E+02	4.64E+01	-5.61E+03
Water use	m^3e depr.	5.90E+01	1.33E+00	2.23E+01	8.27E+01	1.64E+00	1.31E+00	2.02E+00	2.79E-01	-3.24E+01

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Renew. PER as energy	MJ	1.19E+04	4.23E+00	2.59E+01	1.19E+04	3.42E+00	4.16E+00	9.84E+00	8.54E-01	-1.12E+03
Renew. PER as material	MJ	7.79E+03	0.00E+00	-2.07E+03	5.72E+03	0.00E+00	0.00E+00	-3.49E+03	-2.24E+03	0.00E+00
Total use of renew. PER	MJ	1.97E+04	4.23E+00	-2.05E+03	1.77E+04	3.42E+00	4.16E+00	-3.48E+03	-2.24E+03	-2.92E+03
Non-re. PER as energy	MJ	1.27E+03	2.99E+02	9.11E+02	2.48E+03	6.09E+02	2.93E+02	1.85E+02	4.64E+01	-5.61E+03
Non-re. PER as material	MJ	9.96E+01	0.00E+00	4.89E+01	1.48E+02	0.00E+00	0.00E+00	-6.07E+01	-3.89E+01	0.00E+00
Total use of non-re. PER	MJ	1.37E+03	2.99E+02	9.59E+02	2.62E+03	6.09E+02	2.93E+02	1.24E+02	7.48E+00	-5.61E+03
Secondary materials	kg	8.07E-01	1.00E-01	7.81E-02	9.85E-01	2.33E-01	9.86E-02	9.84E-02	1.63E-02	1.99E+02
Renew. secondary fuels	MJ	1.93E-02	1.10E-03	3.73E-02	5.78E-02	7.80E-04	1.08E-03	1.24E-03	6.31E-04	-2.55E+03
Non-ren. secondary fuels	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
Use of net fresh water	m^3	1.20E+00	3.74E-02	1.17E+01	1.29E+01	3.69E-02	3.68E-02	4.05E-02	4.83E-02	-9.13E-01

PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste	kg	4.92E+00	3.39E-01	2.16E+00	7.41E+00	8.21E-01	3.33E-01	6.65E-01	0.00E+00	-2.61E+00
Non-hazardous waste	kg	1.39E+02	5.92E+00	8.40E+01	2.29E+02	5.75E+00	5.82E+00	1.42E+01	1.86E+02	5.38E+01
Radioactive waste	kg	7.53E-03	2.06E-03	4.31E-03	1.39E-02	4.24E-03	2.02E-03	1.07E-03	0.00E+00	-1.09E-03

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Components for re-use	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
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00	0.00E+00
Materials for energy rec	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.98E+01	0.00E+00	0.00E+00
Exported energy	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

ENVIRONMENTAL IMPACTS – EN 15804+A1. CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Global Warming Potential	kg CO_2e	8.32E+01	1.94E+01	5.16E+01	1.54E+02	4.51E+01	1.90E+01	1.30E+01	1.39E+01	-3.36E+02
Ozone depletion Potential	kg $CFC_{-11}e$	9.71E-06	3.63E-06	1.59E-06	1.49E-05	7.66E-06	3.56E-06	1.50E-06	4.64E-07	-2.70E-05
Acidification	kg SO_2e	4.86E-01	6.46E-02	2.56E-01	8.06E-01	3.42E-01	6.18E-02	5.79E-02	1.28E-02	-4.83E-01
Eutrophication	kg PO_4^3e	2.34E-01	1.47E-02	8.25E-02	3.31E-01	7.80E-02	1.43E-02	1.88E-02	5.39E-01	-7.69E-02
POCP (“smog”)	kg C_2H_4e	7.17E-02	2.58E-03	1.19E-02	8.61E-02	7.39E-03	2.49E-03	2.20E-03	3.16E-03	-4.58E-02
ADP-elements	kg Sbe	4.94E-04	7.00E-05	1.21E-04	6.85E-04	2.33E-05	6.89E-05	4.05E-05	6.50E-06	-2.02E-04
ADP-fossil	MJ	1.36E+03	2.99E+02	9.59E+02	2.62E+03	6.09E+02	2.93E+02	1.85E+02	4.64E+01	-5.61E+03

KEY INFORMATION PER KG

Impact category	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
GWP – total	kg CO_2e	-1.93E+00	4.33E-02	6.76E-01	-1.21E+00	9.50E-02	4.25E-02	9.90E-01	6.22E-01	-7.38E-01
GWP – fossil	kg CO_2e	1.78E-01	4.33E-02	1.09E-01	3.31E-01	9.50E-02	4.25E-02	2.74E-02	4.30E-03	-7.54E-01
GWP – biogenic	kg CO_2e	-2.11E+00	0.00E+00	5.61E-01	-1.55E+00	0.00E+00	0.00E+00	9.53E-01	6.12E-01	0.00E+00
ADP-minerals & metals	kg Sbe	1.06E-06	1.50E-07	2.56E-07	1.47E-06	4.90E-08	1.48E-07	8.53E-08	1.41E-08	-4.33E-07
ADP-fossil	MJ	2.87E+00	6.29E-01	2.02E+00	5.52E+00	1.28E+00	6.18E-01	3.90E-01	9.78E-02	-1.18E+01
Water use	m^3e depr.	1.24E-01	2.80E-03	4.70E-02	1.74E-01	3.46E-03	2.75E-03	4.26E-03	5.87E-04	-6.82E-02
Secondary materials	kg	1.70E-03	2.12E-04	1.64E-04	2.07E-03	4.90E-04	2.08E-04	2.07E-04	3.44E-05	4.19E-01
Biog. C in product (A3)	kg C	N/A	N/A	4.31E-01	N/A	N/A	N/A	N/A	N/A	N/A
Biog. C in packaging (A3)	kg C	N/A	N/A	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A

Due to rounding, the numbers presented for Global Warming Potential and Use of Renewable and Non-renewable Primary Energy Resources may not add up precisely to the totals. The totals are, however, correct.

BIBLIOGRAPHY

ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations. Principles and procedures.

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.

ISO 21930:2017 Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services

Ecoinvent database v3.8 (2021) and One Click LCA database.

EN 15804:2012+A2:2019 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

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

EN 16449 Wood and wood-based products - Calculation of the biogenic carbon content of wood and conversion to carbon dioxide.

RTS PCR in line with EN 15804+A2. Published by the Building Information Foundation RTS 26.8.2020.

Elering. Residual mix. 2022 [https://elering.ee/en/residual-mix]

Association of Issuing Bodies. 2020. 2021 [https://www.aib-net.org/facts/european-residual-mix/2020]

Association of Issuing Bodies. European Residual Mix. 2022 [https://www.aib-net.org/facts/european-residual-mix]

Wind Europe. Wind energy in Europe. 2021 Statistics and the outlook for 2022-2026. February 2022 [https://windeurope.org/intelligence-platform/product/wind-energy-in-europe-2021-statistics-and-the-outlook-for-2022-2026/]

Elering. Electricity consumption and production. [https://elering.ee/en/electricity-consumption-and-production]

Eurostat, Statistical Office of the European Union. (2021). Management of waste by waste management operations and type of material - Sankey diagram data (env_wassd)