ENVIRONMENTAL PRODUCT DECLARATION

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

CLT
GLULAM
FINGER-JOINTED STRUCTURAL TIMBER

BY PEETRI PUIT OÜ AND LIIMPUIT AS

UNDER THE ARCWOOD BRAND

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	Peetri Puit OÜ
Address	Pärnaõie 32, 63308 Põlva, Estonia
Affiliate	Liimpuit AS
Affiliate address	Vabriku 44, 63308 Põlva, Estonia
Contact details	info@arcwood.ee
Website	www.arcwood.ee

PRODUCT IDENTIFICATION

Brand name	Arcwood
Products	Cross Laminated Timber (CLT) Glulam Finger-jointed structural timber
Place(s) of production	Põlva, Estonia

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) is used.
EPD author	Mari Kirss Rangi Maja OÜ www.lcasupport.com
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
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EPD number	RTS_197_22
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EPD valid until	19.11.2027

PRODUCT INFORMATION – CLT

PRODUCT DESCRIPTION

Among the wooden construction systems, CLT represents one of the most exciting and innovative materials. CLT offers virtually boundless possibilities regarding construction concept, style, and architecture. CLT stands out for its strength, appearance, versatility, and sustainability.

The number of CLT layers is always odd - 3, 5, 7, or a max of 9 layers. Layers provide a so-called locking effect, which ensures excellent stability of the panel measurements, and stability during humidity changes and significantly reduces the negative effects of wood drying.

PRODUCT APPLICATION

CLT has no architectural constraints, and it can be used as an alternative to concrete in the design of building walls, roofs, and ceilings, and it is very suitable for the construction of taller buildings. Therefore, more and more CLT is used for building private houses, apartment buildings, and industrial and commercial buildings. Building with CLT has a short construction period and achieves up to 10% more living space.

TECHNICAL SPECIFICATIONS

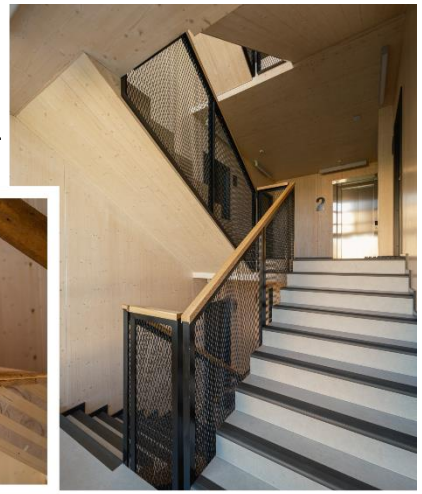
It is possible to mill grooves and slots for communications into the surface of the panel, and it is possible to cut all door and window openings.

PRODUCT STANDARDS

Our products have passed inspection by a recognized and accredited European construction product test lab MPA (Germany), conforming to European standards, EN 14080; EN 15425, EN 338; EN 1995-1-1. We also have an ETA (European Technical Assessment) certification EAD 130005-00-0304. We also use FSC-certified wood for production.

PHYSICAL PROPERTIES OF THE PRODUCT

Maximum measurements: 3,6 x 15 m.
The thickness of panels: 60 – 360 mm
Number of layers: 3, 5, 7 or 9
The thickness of layers: 20, 30, or 40 mm.
Moisture content is 12 ± 2%.



PRODUCT INFORMATION – GLULAM

PRODUCT DESCRIPTION

Glulam is characterized by high load-bearing capacity, dimensional stability, and the ability to form timber parts into almost any shape (straight, curved, arched, tapered, etc.), allowing practically unlimited design freedom in timber construction.

Glulam structures are made from technologically dried wood. The timber layers' necessary length is attained by finger-jointing, which allows us to produce structures of any length by gluing the layers together.

PRODUCT APPLICATION

Glulam use is broad. It can used for sports halls and leisure facilities, public and administrative buildings, industrial and production buildings, office buildings, etc.

It is also the primary material for major load-bearing structures such as bridges, canopies, and pavilions. Glulam is well-suited to long-span designs.

TECHNICAL SPECIFICATIONS

For glulam production, we use spruce, pine, and larch. The moisture content of the using wood is typically 12 ± 2%. The material is visually sorted by quality. Glulam can be made visible and non-visible quality.

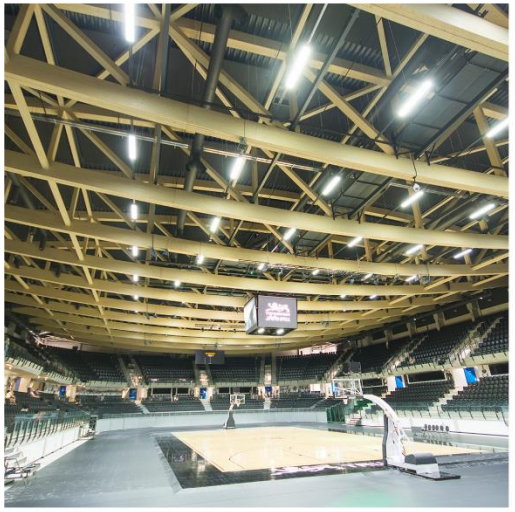
Product parameters:
Length: up to 34 m.
Height: max 2,3 m.
Thickness: 40-500 mm.

PRODUCT STANDARDS

Our products have passed inspection by a recognized and accredited European construction product test lab MPA (Germany), conforming to European standards, EN 14080:2013, EN 14081-4 requirements. We also use FSC-certified wood for production.

PHYSICAL PROPERTIES OF THE PRODUCT

Strength classes: GL 24, GL 28, GL 32.



PRODUCT INFORMATION – FINGER-JOINTED STRUCTURAL TIMBER

PRODUCT DESCRIPTION

Structural timber is technologically dried natural wood with a moisture content of up to 15-18%. The structure is based on lengthwise jointing of components to obtain structural elements that are longer than ordinary timber. In outdoor conditions, it must protect structural wood against the elements by soaking, pressure impregnation, or varnishing, depending on the exact location of use.

PRODUCT APPLICATION

Uses for ARC finger-jointed structural timber are roof battens, floor and ceiling support and frames in home construction, rafters, and overhanging roof beams.

TECHNICAL SPECIFICATIONS

For finger-jointed structural timber, we use spruce. The material is visually sorted by quality. The quality of structural timber is mainly non-visible. Surface quality is planed on four sides, chamfered edges.

PRODUCT STANDARDS

According to DIN 68141/EN 301.

PHYSICAL PROPERTIES OF THE PRODUCT

Moisture content is 15 ± 3%.
Strength classes: C24.
Gluing: Finger joints with PU glue (polyurethane).

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at www.arcwood.ee.

PRODUCT RAW MATERIAL MAIN COMPOSITION (ALL PRODUCTS)

Raw material category	Amount, mass- %	Material origin
Metals	0	N/A
Minerals	0	N/A
Fossil materials	>1	Europe
Bio-based materials	99	Global

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

Arcwood is an Estonian manufacturer of timber constructions with 20 years of experience, whose main products are CLT (cross-laminated timber), glulam structures and ARC finger-jointed structural timber. Arcwood - for us, "ARC" symbolizes flexibility and efficiency in construction and architecture. The same characteristics also describe our company. We have the flexibility and capability to produce to a specific order.

We produce elements with precisely the right cross-section, and every piece of residual product finds an environmentally friendly end-use in our production process, for example, in our heating energy-producing.

We have grown into one of the leading manufacturers of timber structures in Estonia and the Baltics, equipped with state-of-the-art technologies and production methods. Since 2014, Arcwood has been a pioneer in CLT production in Estonia and the Baltics. In addition, Arcwood's export markets extend across Europe and even to Sri Lanka, Iceland, Bangladesh, and Korea.

PRODUCT LIFE-CYCLE

MANUFACTURING AND PACKAGING (A1-A3)

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. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.
This EPD covers two manufacturing locations but only glulam is produced in both locations. Other products are only produced in one of the locations, which is also the brand's flagship location.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.
The final product is transported by lorry.
Installation impacts include provision of all materials, products and energy, as well as waste processing up to end-of-waste state or disposal of final residues during the construction process stage.

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.

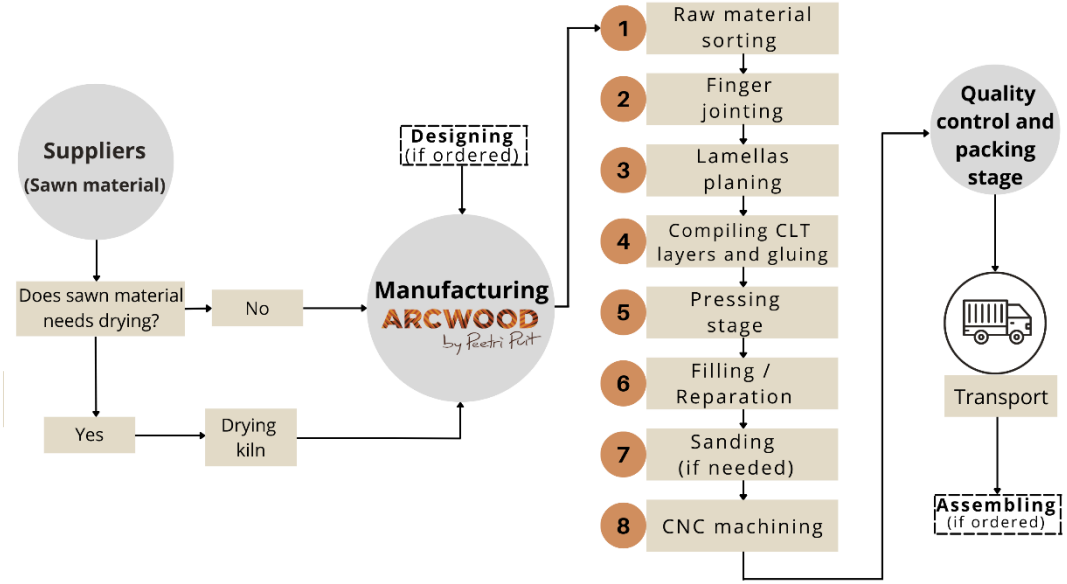
PRODUCT END OF LIFE (C1-C4, D)

At the end-of-life, in the demolition phase, 70% of the waste is assumed to be collected as separate wood waste and 30% as mixed construction waste (C1). 97% of the sorted end-of-life product is assumed to be sent to the closest facilities (C2) and 3% of the sorted end-of-life product and 100% of the mixed construction waste is landfilled or incinerated without energy recovery (C4).

MANUFACTURING PROCESS – CLT

In the production of CLT, we use spruce as raw material. The purchased timber is dried to a suitable moisture content before production begins. The raw material is sorted and cut into finger-jointed lamellas of the required length and then planed to the required dimensions. Then the layers are assembled, and glue is applied between each layer. All the glued lamellas are then pressed together to form a cross-laminated timber (CLT).

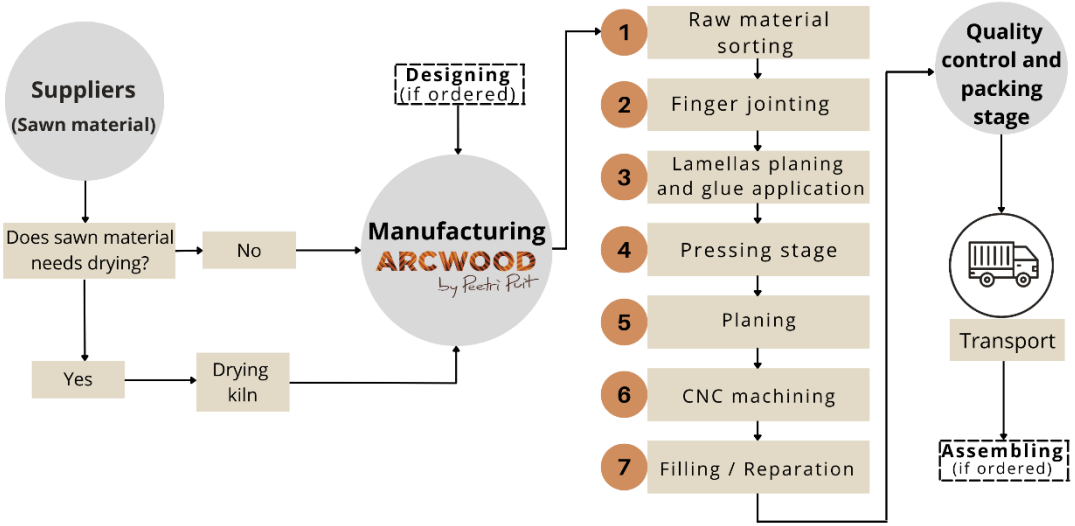
From the CLT panel, the necessary pieces are cut into the right dimensions using CNC machinery. After the CNC machining, the finished CLT panels pass the quality control, and they are packaged in film and delivered to the customer.



MANUFACTURING PROCESS – GLULAM

We produce glued laminated timber using spruce, pine, and larch as raw materials. The purchased timber is dried to a suitable moisture content before production begins. Then, the sawn timber is graded and cut into finger-jointed lamellas of the required length.

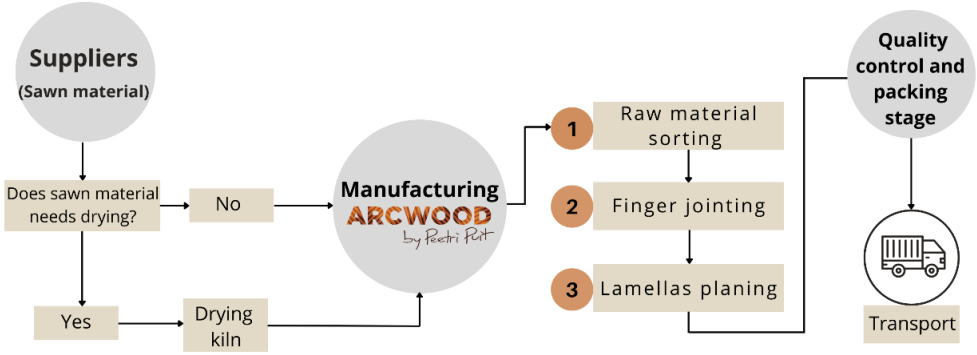
Next, the lamellas are planed, glue is applied between each lamella, and the lamellas go to the glulam press. They are planed to the correct size when they come out of the press. The glulam beams are cut into the right dimensions using CNC machinery. After the CNC machining, the finished glulam beams pass the quality control, are packed in film, and are delivered to the customer.



MANUFACTURING PROCESS – FINGER-JOINTED STRUCTURAL TIMBER

In producing finger-jointed structural timber, we use spruce as raw material. The purchased timber is dried to a suitable moisture content before production begins. Next, the sawn timber is graded and cut into finger-jointed lamellas of the required length before planning.

After the lamellas are planed, the finished finger-jointed structural timber passes the quality control, is packed with film, and is delivered to the customer.



LIFE-CYCLE ASSESSMENT

Product 1 – CLT
Product 2 – Glulam
Product 3 – Finger-jointed structural timber

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	2021

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 m3
Mass per declared unit	460 kg (Product 1) 464 kg (Product 2) 460 kg (Product 3)

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	229 (Product 1) 230 (Product 2) 230 (Product 3)
Biogenic carbon content in packaging, kg C	0

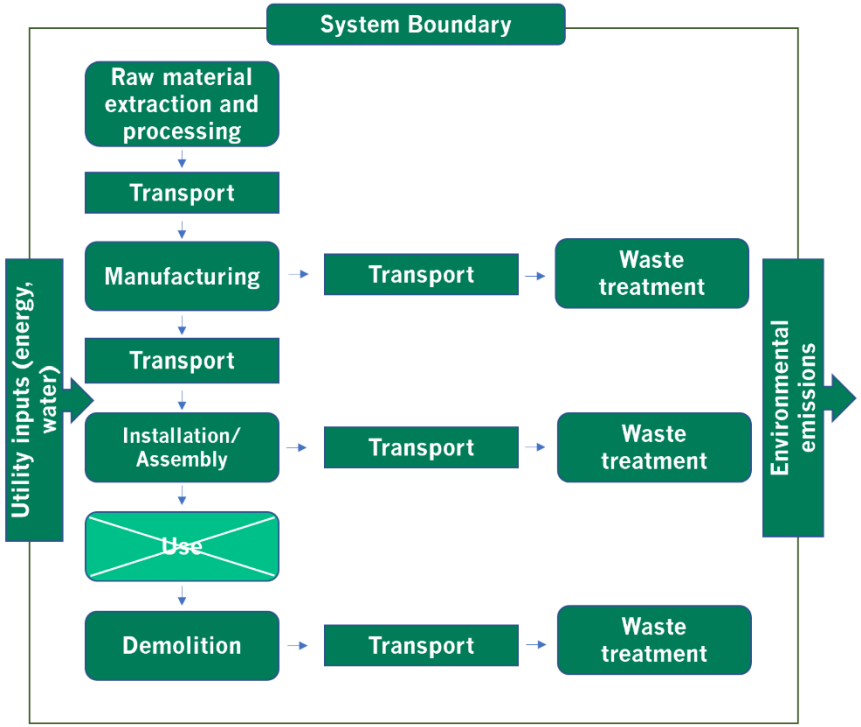
Note. 1 kg biogenic carbon is equivalent to 44/12 kg of biogenic CO2.

SYSTEM BOUNDARY

The scope of the EPD is cradle to gate with options, modules C1-C4 and module D. Included are A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport), A5 (Assembly) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing), C4 (Disposal) and module D - benefits and loads beyond the system boundary is included.

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	x	x	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	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

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



CUT-OFF CRITERIA

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.

Cut off has been applied only in C1 to exclude fasteners.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation.

In this study, as per EN 15804, allocation is conducted in the following order;

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.

3. Allocation should be based on economic values.

Module A1 includes allocation for co-products. Allocation has been done based on economic values as the Products and co-products share of revenue differs greatly.

Allocation used in Ecoinvent 3.6 environmental data sources follows the methodology 'allocation, cut-off by classification'. This methodology is in line with the requirements of the EN 15804 - standard.

This LCA study is conducted in accordance with all methodological considerations, such as performance, system boundaries, data quality, allocation procedures, and decision rules to evaluate inputs and outputs. All estimations and assumptions are given below:

• Module A2, A4 & C2

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.

• Module A3

Waste wood used for drying kilns was allocated based on share of wet wood used for each Product. All other energy use and waste was allocated based on production volume.

• Module A4

The transportation distance is defined according to RTS PCR. The typical installation place was assumed as an average option. According to the manufacturer, transportation doesn't cause losses as products are packaged properly. Also, volume capacity utilisation factor is assumed to be 1 for the nested packaged products.

• Module A5

Consumption of energy in installation process are assumed to be 38 MJ of diesel per m3 of CLT and glulam. Metal fasteners are assumed to be used in the amount of 4.5 kg (CLT), 16.5 kg (glulam) and 4 kg (finger-jointed structural timber) per 1 m3.

• Module C1

Consumption of energy in demolition process is assumed to be 38 MJ of diesel per m3 of product. It is assumed that 100% of the waste is collected. Fasteners are excluded.

• Module C2

It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed to have the same weight with the declared product. All of the end-of-life product is assumed to be collected as sorted wood waste or mixed construction waste and sent to the closest facilities such as recycling and landfill. Transportation distance to the closest disposal area is estimated as 250 km and the transportation method is assumed as lorry, which is the most common option.

• Module C3

97% of the sorted wood waste is recycled. Losses in the sorting process are assumed to be very small and not considered in the assessment.

• Module C4

The remaining 3% of the sorted wood and 100% of the mixed construction waste are assumed to be sent to landfill.

• Module D

Benefits of recyclable waste generated in the Module C3 are considered. It was assumed that 47.49% of the sorted wood waste is incinerated and 49.47% is recycled to be used again (for example, to produce fibreboard).

SOFTWARE AND DATABASE

The LCA and EPD have been created using One Click LCA Pre-Verified EPD Generator for Wood and plant-fibre based products.

This EPD is based on the Ecoinvent 3.6 (cut-off) database and One Click LCA databases.

BIOGENIC CARBON AND GWP-BIOGENIC

Biogenic carbon content in Products and packaging has been calculated according to EN 16449. Irrespective of the chosen allocation for co-products, biogenic carbon content reflects physical flows.

In the ecoinvent database, datasets with multiple products are allocated in the attributional system models, most frequently using price. When products have large difference in value, this leads to an allocation of most of the impacts to the more valuable product and can lead to a discrepancy between the biogenic carbon content of a product and the amount allocated to it based on the life cycle inventory (Ruiz et al, 2021). Therefore, GWP-biogenic values have been recalculated based on EN 16449 and EN 16485:2014. Carbon sequestration and carbon neutrality has only been assumed for sustainable wood (FSC-certified).

SCENARIO DOCUMENTATION

Product 1 – CLT
Product 2 – Glulam
Product 3 – Finger-jointed structural timber

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Modelled electricity based on Estonian energy mix for 2020-2021
Electricity CO_2e / kWh	0.60

Transport scenario documentation (A4)

Scenario parameter	Product 1	Product 2	Product 3
Specific transport CO_2e emissions, kg CO_2e / tkm	0.0901	0.0901	0.0901
Average transport distance, km	900	1300	1900
Capacity utilization (including empty return) %	100	100	100
Bulk density of transported products (including packaging)	462	465	461
Volume capacity utilization factor	1	1	1

End of life scenario documentation

Scenario parameter	Product 1	Product 2	Product 3
Collection process – kg collected separately	322	325	322
Collection process – kg collected with mixed waste	138	139	138
Recovery process – kg for re-use	0	0	0
Recovery process – kg for recycling	159	161	159
Recovery process – kg for energy recovery	153	154	153
Disposal (total) – kg for final deposition	148	149	148
Scenario assumptions e.g. transportation	End-of-life product is transported 250 km with an average lorry.		

ENVIRONMENTAL IMPACT DATA – CLT

Additional environmental impact data presented in annexes.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2. PEF

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	-9.54E2	3.92E2	-5.61E2	3.75E1	2.88E1	3.48E0	1.92E1	8.42E2	5.14E1	-4.43E2
GWP – fossil	kg CO_2e	1.25E2	7.38E1	1.99E2	3.78E1	2.86E1	3.48E0	1.92E1	2.73E0	5.14E1	-2.36E2
GWP – biogenic	kg CO_2e	-1.08E3	2.97E2	-7.82E2	2.74E-2	1.58E-1	9.68E-4	1.02E-2	7.84E2	3.27E-3	-2.63E2
GWP – LULUC	kg CO_2e	6.81E-1	2.12E1	2.19E1	1.14E-2	1.67E-2	2.94E-4	6.8E-3	5.59E1	1.31E-3	5.58E1
Ozone depletion pot.	kg CFC_{-11}e	1.74E-5	3.92E-6	2.13E-5	8.88E-6	1.89E-6	7.51E-7	4.35E-6	2.29E-7	5.13E-7	-2.04E-5
Acidification potential	mol H^+e	8.57E-1	4.45E-1	1.3E0	1.59E-1	1.73E-1	3.64E-2	7.83E-2	1.51E-2	3.55E-2	-4.49E-1
EP-freshwater	kg Pe	7.75E-3	2.89E-3	1.06E-2	3.07E-4	8.76E-4	1.41E-5	1.6E-4	2.85E-4	7.15E-5	-1.37E-3
EP-marine	kg Ne	2.71E-1	6.31E-2	3.34E-1	4.78E-2	3.95E-2	1.61E-2	2.33E-2	2.03E-3	1.49E-2	-9.6E-2
EP-terrestrial	mol Ne	2.94E0	7.25E-1	3.67E0	5.28E-1	4.42E-1	1.76E-1	2.57E-1	2.47E-2	1.55E-1	-1.05E0
POCP (“smog”)	kg NMVOCe	8.92E-1	1.97E-1	1.09E0	1.7E-1	1.35E-1	4.85E-2	7.87E-2	6.44E-3	3.92E-2	-3.78E-1
ADP-minerals & metals	kg Sbe	2.22E-3	2.14E-4	2.43E-3	6.45E-4	7.18E-4	5.31E-6	5.18E-4	1.06E-5	6.77E-5	-3.37E-4
ADP-fossil resources	MJ	1.79E3	1.38E3	3.17E3	5.88E2	2.81E2	4.79E1	2.89E2	5.52E1	4.15E1	-3.71E3
Water use	m^3e depr.	3.41E1	1.16E1	4.57E1	2.19E0	2.38E1	8.93E-2	9.31E-1	6.9E-1	4.33E0	-1.28E1

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	4.91E3	3.71E1	4.95E3	7.4E0	5.82E1	2.59E-1	4.08E0	-9.29E0	-1.16E0	-1.05E3
Renew. PER as material	MJ	1.53E4	-4.35E3	1.10E4	0E0	0E0	0E0	0E0	-7.45E3	-3.52E3	-7.45E3
Total use of renew. PER	MJ	2.02E4	-4.31E3	1.59E4	7.4E0	5.82E1	2.59E-1	4.08E0	-7.45E3	-3.53E3	-5.97E3
Non-re. PER as energy	MJ	1.68E3	1.31E3	2.99E3	5.88E2	2.81E2	4.79E1	2.89E2	5.52E1	-4.15E1	-3.71E3
Non-re. PER as material	MJ	1.05E2	7.25E1	1.78E2	0E0	-7.25E1	0E0	0E0	0E0	-1.05E2	0E0

Total use of non-re. PER	MJ	1.79E3	1.38E3	3.17E3	5.88E2	2.08E2	4.79E1	2.89E2	5.52E1	-1.47E2	-3.71E3
Secondary materials	kg	3.36E-2	2.45E-2	5.81E-2	0E0	7.77E-1	0E0	0E0	0E0	0E0	0E0
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	6.19E1	6.19E1	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m^3	3.67E-1	1.71E-1	5.37E-1	2.58E-1	1.09E-1	0E0	4.94E-2	1.73E-2	1.71E-1	-9.18E-1

PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	5.85E0	2.57E0	8.43E0	5.71E-1	2.07E1	5.15E-2	2.93E-1	0E0	3.58E0	-1.17E0
Non-hazardous waste	kg	1.63E2	1.25E2	2.87E2	6.32E1	4.84E1	5.51E-1	2.02E1	0E0	1.44E2	1.2E2
Radioactive waste	kg	8.24E-3	5.91E-3	1.42E-2	4.03E-3	8.32E-4	3.35E-4	1.98E-3	0E0	1.71E-4	-1.17E-3

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	1.59E2	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	1.53E2	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	-2.07E0	8.53E-1	-1.22E0	8.22E-2	6.25E-2	7.57E-3	4.17E-2	1.83E0	1.12E-1	-9.63E-1
ADP-minerals & metals	kg Sbe	4.82E-6	4.64E-7	5.28E-6	1.4E-6	1.56E-6	1.16E-8	1.13E-6	2.3E-8	1.47E-7	-7.33E-7
ADP-fossil	MJ	3.89E0	3.01E0	6.89E0	1.28E0	6.12E-1	1.04E-1	6.28E-1	1.2E-1	9.03E-2	-8.06E0
Water use	m^3e depr.	7.42E-2	2.52E-2	9.93E-2	4.75E-3	5.17E-2	1.94E-4	2.02E-3	1.5E-3	9.41E-3	-2.79E-2
Secondary materials	kg	7.31E-5	5.32E-5	1.26E-4	0E0	1.69E-3	0E0	0E0	0E0	0E0	0E0
Biog. C in product	kg C	N/A	4.98E-1	4.98E-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biog. C in packaging	kg C	N/A	0E0	0E0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

ENVIRONMENTAL IMPACT DATA - GLULAM

Additional environmental impact data presented in annexes.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2. PEF

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	-9.35E2	4.02E2	-5.33E2	5.45E1	8.49E1	3.48E0	1.94E1	8.45E2	5.19E1	-4.2E2
GWP – fossil	kg CO_2e	1.35E2	4.97E1	1.85E2	5.49E1	8.43E1	3.48E0	1.93E1	2.75E0	5.19E1	-2.38E2
GWP – biogenic	kg CO_2e	-1.07E3	3.16E2	-7.55E2	3.99E-2	5.76E-1	9.68E-4	1.03E-2	7.56E2	9.62E-3	-2.68E2
GWP – LULUC	kg CO_2e	7.32E-1	3.6E1	3.68E1	1.65E-2	6.03E-2	2.94E-4	6.86E-3	8.64E1	1.32E-3	8.63E1
Ozone depletion pot.	kg $CFC_{-11}e$	1.99E-5	2.64E-6	2.25E-5	1.29E-5	4.89E-6	7.51E-7	4.39E-6	2.3E-7	5.17E-7	-2.06E-5
Acidification potential	mol H^+e	9.6E-1	2.96E-1	1.26E0	2.31E-1	5.34E-1	3.64E-2	7.9E-2	1.52E-2	3.57E-2	-4.52E-1
EP-freshwater	kg Pe	8.35E-3	1.93E-3	1.03E-2	4.47E-4	3.17E-3	1.41E-5	1.62E-4	2.87E-4	7.2E-5	-1.37E-3
EP-marine	kg Ne	2.84E-1	4.22E-2	3.26E-1	6.95E-2	1.01E-1	1.61E-2	2.35E-2	2.04E-3	1.5E-2	-9.65E-2
EP-terrestrial	mol Ne	3.3E0	4.83E-1	3.79E0	7.68E-1	1.14E0	1.76E-1	2.59E-1	2.49E-2	1.56E-1	-1.06E0
POCP ("smog")	kg NMVOCe	9.55E-1	1.31E-1	1.09E0	2.47E-1	3.61E-1	4.85E-2	7.94E-2	6.49E-3	3.95E-2	-3.8E-1
ADP-minerals & metals	kg Sbe	2.51E-3	1.39E-4	2.65E-3	9.37E-4	2.61E-3	5.31E-6	5.23E-4	1.07E-5	6.83E-5	-3.38E-4
ADP-fossil resources	MJ	1.97E3	9.17E2	2.88E3	8.54E2	9.01E2	4.79E1	2.92E2	5.57E1	4.19E1	-3.74E3
Water use	m^3e depr.	5.53E1	7.34E0	6.26E1	3.18E0	8.64E1	8.93E-2	9.39E-1	6.95E-1	4.36E0	-1.29E1

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	5.51E3	2.43E1	5.53E3	1.08E1	2.13E2	2.59E-1	4.11E0	-9.36E0	-1.17E0	-3.74E3
Renew. PER as material	MJ	1.56E4	-4.73E3	1.09E4	0E0	0E0	0E0	0E0	-7.41E3	-3.51E3	-7.41E3
Total use of renew. PER	MJ	2.12E4	-4.70E3	1.65E4	1.08E1	2.13E2	2.59E-1	4.11E0	-7.42E3	-3.51E3	-1.12E4
Non-re. PER as energy	MJ	1.83E3	8.76E2	2.7E3	8.54E2	9.01E2	4.79E1	2.92E2	5.57E1	-4.19E1	-3.74E3
Non-re. PER as material	MJ	1.41E2	4.04E1	1.82E2	0E0	-4.04E1	0E0	0E0	0E0	-1.41E2	0E0

Total use of non-re. PER	MJ	1.97E3	9.17E2	2.88E3	8.54E2	8.61E2	4.79E1	2.92E2	5.57E1	-1.83E2	-3.74E3
Secondary materials	kg	9.93E-2	2.67E-2	1.26E-1	0E0	2.85E0	0E0	0E0	0E0	0E0	0E0
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m^3	5.67E-1	2.37E-1	8.04E-1	1.78E-1	4.42E-1	4.23E-3	4.98E-2	1.74E-2	1.72E-1	-9.25E-1

PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	6.67E0	1.72E0	8.39E0	8.3E-1	7.57E1	5.15E-2	2.96E-1	0E0	3.61E0	-1.18E0
Non-hazardous waste	kg	1.88E2	8.32E1	2.71E2	9.19E1	1.71E2	5.51E-1	2.03E1	0E0	1.45E2	1.21E2
Radioactive waste	kg	8.99E-3	3.93E-3	1.29E-2	5.87E-3	2.14E-3	3.35E-4	2E-3	0E0	1.72E-4	-1.17E-3

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	1.61E2	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	1.54E2	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	-2.03E0	8.73E-1	-1.16E0	1.2E-1	1.85E-1	7.57E-3	4.21E-2	1.84E0	1.13E-1	-9.13E-1
ADP-minerals & metals	kg Sbe	5.46E-6	3.02E-7	5.76E-6	2.04E-6	5.68E-6	1.16E-8	1.14E-6	2.32E-8	1.48E-7	-7.34E-7
ADP-fossil	MJ	4.28E0	1.99E0	6.27E0	1.86E0	1.96E0	1.04E-1	6.34E-1	1.21E-1	9.1E-2	-8.12E0
Water use	m^3e depr.	1.2E-1	1.6E-2	1.36E-1	6.91E-3	1.88E-1	1.94E-4	2.04E-3	1.51E-3	9.48E-3	-2.81E-2
Secondary materials	kg	2.16E-4	5.81E-5	2.74E-4	0E0	6.2E-3	0E0	0E0	0E0	0E0	0E0
Biog. C in product	kg C	N/A	4.96E-1	4.96E-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biog. C in packaging	kg C	N/A	0E0	0E0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

ENVIRONMENTAL IMPACT DATA – FINGER-JOINTED STRUCTURAL TIMBER

Additional environmental impact data presented in annexes.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2. PEF

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	-7.66E2	1.25E2	-6.42E2	7.89E1	2.14E1	0E0	1.92E1	8.46E2	5.14E1	-4.24E2
GWP – fossil	kg CO_2e	8.45E1	3.12E1	1.16E2	7.96E1	2.13E1	0E0	1.92E1	2.73E0	5.14E1	-2.36E2
GWP – biogenic	kg CO_2e	-8.51E2	8.49E1	-7.66E2	5.78E-2	1.4E-1	0E0	1.02E-2	7.67E2	3.27E-3	-2.63E2
GWP – LULUC	kg CO_2e	5.1E-1	8.35E0	8.86E0	2.4E-2	1.46E-2	0E0	6.8E-3	7.58E1	1.31E-3	7.56E1
Ozone depletion pot.	kg CFC_{-11}e	1.35E-5	1.65E-6	1.51E-5	1.87E-5	1.01E-6	0E0	4.35E-6	2.29E-7	5.13E-7	-2.04E-5
Acidification potential	mol H^+e	5.79E-1	1.82E-1	7.6E-1	3.34E-1	1.21E-1	0E0	7.83E-2	1.51E-2	3.55E-2	-4.49E-1
EP-freshwater	kg Pe	4.9E-3	1.19E-3	6.08E-3	6.48E-4	7.66E-4	0E0	1.6E-4	2.85E-4	7.15E-5	-1.37E-3
EP-marine	kg Ne	1.89E-1	2.65E-2	2.15E-1	1.01E-1	2.07E-2	0E0	2.33E-2	2.03E-3	1.49E-2	-9.6E-2
EP-terrestrial	mol Ne	2.06E0	3.02E-1	2.36E0	1.11E0	2.36E-1	0E0	2.57E-1	2.47E-2	1.55E-1	-1.05E0
POCP (“smog”)	kg NMVOCe	6.41E-1	8.36E-2	7.25E-1	3.58E-1	7.62E-2	0E0	7.87E-2	6.44E-3	3.92E-2	-3.78E-1
ADP-minerals & metals	kg Sbe	1.65E-3	9.65E-5	1.75E-3	1.36E-3	6.33E-4	0E0	5.18E-4	1.06E-5	6.77E-5	-3.37E-4
ADP-fossil resources	MJ	1.18E3	5.9E2	1.77E3	1.24E3	2.07E2	0E0	2.89E2	5.52E1	4.15E1	-3.71E3
Water use	m^3e depr.	1.2E1	5.2E0	1.72E1	4.61E0	2.1E1	0E0	9.31E-1	6.9E-1	4.33E0	-1.28E1

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	3.33E3	1.64E1	3.35E3	1.56E1	5.15E1	0E0	4.08E0	-9.29E0	-1.16E0	-1.05E3
Renew. PER as material	MJ	1.22E4	-1.22E3	1.10E4	0E0	0E0	0E0	0E0	-7.48E3	-3.54E3	-7.48E3
Total use of renew. PER	MJ	1.56E4	-1.20E3	1.44E4	1.56E1	5.15E1	0E0	4.08E0	-7.49E3	-3.54E3	-8.53E3
Non-re. PER as energy	MJ	1.17E3	5.47E2	1.71E3	1.24E3	2.07E2	0E0	2.89E2	5.52E1	-4.15E1	-3.71E3
Non-re. PER as material	MJ	1.24E1	4.32E1	5.56E1	0E0	-4.32E1	0E0	0E0	0E0	-1.24E1	0E0

Total use of non-re. PER	MJ	1.18E3	5.9E2	1.77E3	1.24E3	1.64E2	0E0	2.89E2	5.52E1	-5.39E1	-3.71E3
Secondary materials	kg	1.2E-3	1.46E-2	1.58E-2	0E0	6.91E-1	0E0	0E0	0E0	0E0	0E0
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	6.19E1	6.19E1	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m^3	3.67E-1	1.71E-1	5.37E-1	2.58E-1	1.09E-1	0E0	4.94E-2	1.73E-2	1.71E-1	-9.18E-1

PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	3.82E0	1.08E0	4.9E0	1.2E0	1.84E1	0E0	2.93E-1	0E0	3.58E0	-1.17E0
Non-hazardous waste	kg	1.13E2	5.1E1	1.64E2	1.33E2	4.21E1	0E0	2.02E1	0E0	1.44E2	1.2E2
Radioactive waste	kg	6.44E-3	2.42E-3	8.85E-3	8.5E-3	4.42E-4	0E0	1.98E-3	0E0	1.71E-4	-1.17E-3

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	1.59E2	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	1.53E2	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	-1.67E0	2.71E-1	-1.4E0	1.73E-1	4.66E-2	0E0	4.17E-2	1.84E0	1.12E-1	-9.21E-1
ADP-minerals & metals	kg Sbe	3.59E-6	2.1E-7	3.8E-6	2.95E-6	1.38E-6	0E0	1.13E-6	2.3E-8	1.47E-7	-7.33E-7
ADP-fossil	MJ	2.57E0	1.28E0	3.85E0	2.69E0	4.51E-1	0E0	6.28E-1	1.2E-1	9.03E-2	-8.06E0
Water use	m^3e depr.	2.6E-2	1.13E-2	3.73E-2	1E-2	4.57E-2	0E0	2.02E-3	1.5E-3	9.41E-3	-2.79E-2
Secondary materials	kg	2.61E-6	3.17E-5	3.43E-5	0E0	1.5E-3	0E0	0E0	0E0	0E0	0E0
Biog. C in product	kg C	N/A	5.00E-1	5.00E-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biog. C in packaging	kg C	N/A	0E0	0E0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with EN 15804, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The background report (project report) for this EPD

Why does verification transparency matter? Read more online.

VERIFICATION OVERVIEW

Following independent third party has verified this specific EPD:

EPD verification information	Answer
Independent EPD verifier	Sigita Židonienė Vesta
EPD verification started on	4 October 2022
EPD verification completed on	20 October 2022
Approver of the EPD verifier	The Building Information Foundation RTS sr

Author & tool verification	Answer
EPD author	Mari Kirss
EPD Generator module	Wood and plant-fibre based products
Software verification date	17 January 2021

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of

- the data collected and used in the LCA calculations,
- the way the LCA-based calculations have been carried out,
- the presentation of environmental data in the EPD, and
- other additional environmental information, as present

with respect to the procedural and methodological requirements in ISO 14025:2010 and EN 15804:2012+A2:2019.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Sigita Židonienė

ANNEX 1 : ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

CLT

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1.22E2	7.28E1	1.95E2	3.75E1	8.15E1	3.45E0	1.9E1	2.69E0	5.14E1	-2.3E2
Ozone depletion Pot.	kg CFC_{-11}e	1.41E-5	4.34E-6	1.85E-5	7.06E-6	4.11E-6	5.95E-7	3.47E-6	2.69E-7	4.85E-7	-1.58E-5
Acidification	kg SO_2e	5.78E-1	3.83E-1	9.61E-1	7.69E-2	4.13E-1	5.14E-3	3.84E-2	1.29E-2	5.69E-2	-3.58E-1
Eutrophication	kg PO_4^{3}e	1.86E-1	1.06E-1	2.92E-1	1.55E-2	1.34E-1	9.05E-4	7.9E-3	8.98E-3	2.91E-2	-3.92E-2
POCP ("smog")	kg C_2H_4e	4.21E-2	1.65E-2	5.86E-2	4.87E-3	2.67E-2	5.29E-4	2.53E-3	5.31E-4	7.34E-4	-3.28E-2
ADP-elements	kg Sbe	2.22E-3	2.14E-4	2.43E-3	6.45E-4	2.61E-3	5.31E-6	5.18E-4	1.06E-5	6.77E-5	-3.37E-4
ADP-fossil	MJ	1.79E3	1.38E3	3.17E3	5.88E2	9.01E2	4.79E1	2.89E2	5.52E1	4.15E1	-3.71E3

GLULAM

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1.33E2	4.91E1	1.82E2	5.45E1	2.62E1	3.45E0	1.92E1	2.71E0	5.18E1	-2.32E2
Ozone depletion Pot.	kg CFC_{-11}e	1.62E-5	2.91E-6	1.91E-5	1.03E-5	1.56E-6	5.95E-7	3.5E-6	2.71E-7	4.89E-7	-1.59E-5
Acidification	kg SO_2e	6.49E-1	2.55E-1	9.04E-1	1.12E-1	1.17E-1	5.14E-3	3.88E-2	1.3E-2	5.74E-2	-3.61E-1
Eutrophication	kg PO_4^{3}e	2.09E-1	7.07E-2	2.8E-1	2.26E-2	3.73E-2	9.05E-4	7.97E-3	9.06E-3	2.94E-2	-3.93E-2
POCP ("smog")	kg C_2H_4e	4.84E-2	1.09E-2	5.93E-2	7.08E-3	7.67E-3	5.29E-4	2.55E-3	5.35E-4	7.4E-4	-3.3E-2
ADP-elements	kg Sbe	2.51E-3	1.39E-4	2.65E-3	9.37E-4	7.17E-4	5.31E-6	5.23E-4	1.07E-5	6.83E-5	-3.38E-4
ADP-fossil	MJ	1.97E3	9.17E2	2.88E3	8.54E2	2.81E2	4.79E1	2.92E2	5.57E1	4.19E1	-3.74E3

FINGER-JOINTED STRUCTURAL TIMBER

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	8.34E1	3.08E1	1.14E2	7.89E1	2.06E1	0E0	1.9E1	2.69E0	5.14E1	-2.3E2
Ozone depletion Pot.	kg $CFC_{-11}e$	1.09E-5	1.82E-6	1.27E-5	1.49E-5	8.61E-7	0E0	3.47E-6	2.69E-7	4.85E-7	-1.58E-5
Acidification	kg SO_2e	3.79E-1	1.56E-1	5.34E-1	1.62E-1	9.91E-2	0E0	3.84E-2	1.29E-2	5.69E-2	-3.58E-1
Eutrophication	kg $PO_4^{3}e$	1.21E-1	4.36E-2	1.64E-1	3.27E-2	3.24E-2	0E0	7.9E-3	8.98E-3	2.91E-2	-3.92E-2
POCP (“smog”)	kg C_2H_4e	2.93E-2	7.11E-3	3.64E-2	1.03E-2	6.35E-3	0E0	2.53E-3	5.31E-4	7.34E-4	-3.28E-2
ADP-elements	kg Sbe	1.65E-3	9.65E-5	1.75E-3	1.36E-3	6.33E-4	0E0	5.18E-4	1.06E-5	6.77E-5	-3.37E-4
ADP-fossil	MJ	1.18E3	5.9E2	1.77E3	1.24E3	2.07E2	0E0	2.89E2	5.52E1	4.15E1	-3.71E3

ANNEX 2 : ENVIRONMENTAL IMPACTS – FRENCH NATIONAL COMPLEMENTS ACCORDING TO EN 15804+A1

The results for French national complements have been calculated according to all requirements and using a pre-verified EPD tool but have not been separately verified.

CLT

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
ADP-elements	kg Sbe	2.21E-3	2.13E-4	2.43E-3	6.44E-4	3.07E-5	5.3E-6	5.18E-4	1.05E-5	6.62E-5	-3.37E-4
HWD	kg	3.74E0	4.99E0	8.73E0	3.62E-1	9.1E-2	3.02E-2	1.86E-1	7.35E-2	2.62E1	2.04E-1
NHWD	kg	1.63E2	1.25E2	2.87E2	6.32E1	3.51E0	5.51E-1	2.02E1	1.28E1	1.44E2	1.2E2
Air pollution	m^3	2.03E4	4.49E3	2.47E4	4.86E3	2.96E2	3.46E2	1.91E3	2.16E2	5.65E2	-5.49E3
Water pollution	m^3	4.19E1	4.11E0	4.6E1	1.31E1	5.91E-1	1.03E0	6.4E0	7.18E-1	6.07E0	-2.32E1

HWD = Hazardous waste disposed; NHW = Non-hazardous waste disposed

GLULAM

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
ADP-elements	kg Sbe	2.51E-3	1.39E-4	2.65E-3	9.36E-4	2.61E-3	5.3E-6	5.23E-4	1.06E-5	6.67E-5	-3.37E-4
HWD	kg	4.29E0	3.35E0	7.63E0	5.26E-1	7.34E1	3.02E-2	1.88E-1	7.4E-2	2.64E1	2.1E-1
NHWD	kg	1.88E2	8.32E1	2.71E2	9.19E1	1.71E2	5.51E-1	2.03E1	1.29E1	1.45E2	1.21E2
Air pollution	m^3	2.33E4	3.02E3	2.63E4	7.07E3	2.17E4	3.46E2	1.93E3	2.18E2	5.69E2	-5.52E3
Water pollution	m^3	4.45E1	2.78E0	4.72E1	1.9E1	1.77E1	1.03E0	6.46E0	7.24E-1	6.12E0	-2.34E1

HWD = Hazardous waste disposed; NHW = Non-hazardous waste disposed

FINGER-JOINTED STRUCTURAL TIMBER

Impact category	Unit	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
ADP-elements	kg Sbe	1.65E-3	9.64E-5	1.75E-3	1.36E-3	6.33E-4	0E0	5.18E-4	1.05E-5	6.62E-5	-3.37E-4
HWD	kg	2.46E0	2.02E0	4.47E0	7.63E-1	1.78E1	0E0	1.86E-1	7.35E-2	2.62E1	2.04E-1
NHWD	kg	1.13E2	5.1E1	1.64E2	1.33E2	4.21E1	0E0	2.02E1	1.28E1	1.44E2	1.2E2
Air pollution	m^3	1.32E4	1.89E3	1.51E4	1.02E4	5.18E3	0E0	1.91E3	2.16E2	5.65E2	-5.49E3
Water pollution	m^3	2.95E1	1.85E0	3.14E1	2.75E1	4.12E0	0E0	6.4E0	7.18E-1	6.07E0	-2.32E1

HWD = Hazardous waste disposed; NHW = Non-hazardous waste disposed