ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2006 and
EN 15804:2012+A2:2019/AC:2021 for:

LAMINATED VENEER LUMBER (LVL) FOR CONSTRUCTION

from UAB VMG Lignum construction

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0010876
Publication date:	2023-10-09
Revision date:	2024-02-06
Valid until:	2028-10-08

VMG LIGNUM CONSTRUCTION

GENERAL INFORMATION

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

ACCOUNTABILITIES FOR PCR, LCA AND INDEPENDENT, THIRD-PARTY VERIFICATION

PRODUCT CATEGORY RULES (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): Construction products 2019:14 Version 1.2.5, 2022-11-20; c-PCR-006 Wood and wood-based products for use in construction (EN 16485:2014) Version 2019-12-20

UN CPC code of 3143

PCR review was conducted by: Martin Erlandsson, IVL Swedish Environmental Research Institute, martin.erlandsson@ivl.se

LIFE CYCLE ASSESSMENT (LCA)

LCA accountability: Sigita Židonienė, PhD., Vesta Consulting
www.vestaconsulting.lt

THIRD-PARTY VERIFICATION

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

☒ EPD verification by individual verifier

Third-party verifier: Prof. Ing. Vladimír Kočí, PhD., vladimir.koci@lca.cz
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 registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data and etc. For further information about comparability, see EN 15804 and ISO 14025.

COMPANY INFORMATION

Owner of the EPD:

UAB VMG Lignum construction

+370 46 469 508

Vilma Burškytė

vilma.burskyte@vmg.eu

Description of the organisation:

UAB VMG Lignum construction, established 2020, as part of VMG group. Core activities of our company - production of construction particle boards, middle of this year start production of LVL and I joist for construction markets.

The mission of the VMG group is the way to a sustainable home. Sustainable development, innovation, quality, flexibility, and attention to customers are key values of whole VMG group.

Product-related or management system-related certifications:

UAB VMG Lignum LVL has CE marking and represents that products comply with the EU's New Approach Directives. LVL are manufactured in compliance with these European standards which specifies all requirements for factory made, technical parameters:

a) EN 14374: 2004
b) EN 13986

Name and location of production site(s):

UAB VMG Lignum constructions
Ryto g. 6, Menčių km. Akmenės r.

PRODUCT INFORMATION

Product name: LAMINATED VENEER LUMBER (LVL) FOR CONSTRUCTION.

Product description:

VMG LIGNUM LVL is a type of engineered timber used in construction, called Laminated Veneer Lumber (LVL). Its beams and boards are suitable for a wide range of timber structures, especially when maximum strength is required.

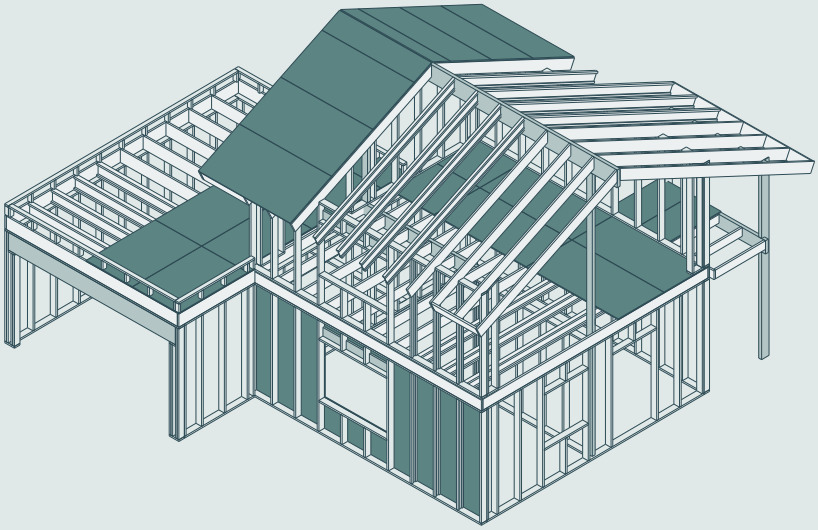
LVL is also the most efficiently biomass-utilizing load bearing material of all engineered timber load-bearing construction materials. In VMG LIGNUM LVL–P all veneers are glued parallel. Slabs and beams made of VMG LVL-P are used very efficiently due to their height to thickness ratio. VMG LVL-P can be used both vertically and horizontally.

In VMG LIGNUM LVL-C, up to 20% of the veneers are cross-glued. Cross gluing improves the lateral bending strength and stiffness of the panel, and the shear strength of such a product is higher.

PRODUCT USE:

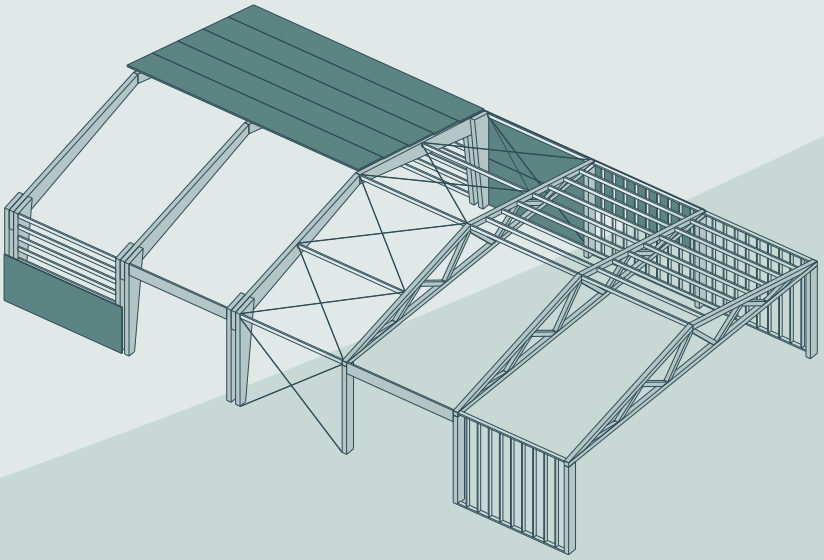
VMG LIGNUM LVL can widely be used in buildings for:

① all studs (LVL-P), wall plates,
② roof beams (LVL-P),
③ rim board (LVL-P/ C),
④ floor beams (LVL– C/P), floor plates,
⑤ stiffness plate/wall plates (LVL–C),
⑥ corridor floor slabs (LVL–C),
⑦ roof panels (LVL-C),
⑧ lintels (LVL-P/C, GLVL),
⑨ ledger beams (LVL-P/C, GLVL),
⑩ athroom module structure/wall plates (LVL-C), elevator shaft plates (LVL-C),
⑪ RIB floor panels (LVL-P/C, GLVL),
⑫ balcony floor/ roof panels (LVL-C).

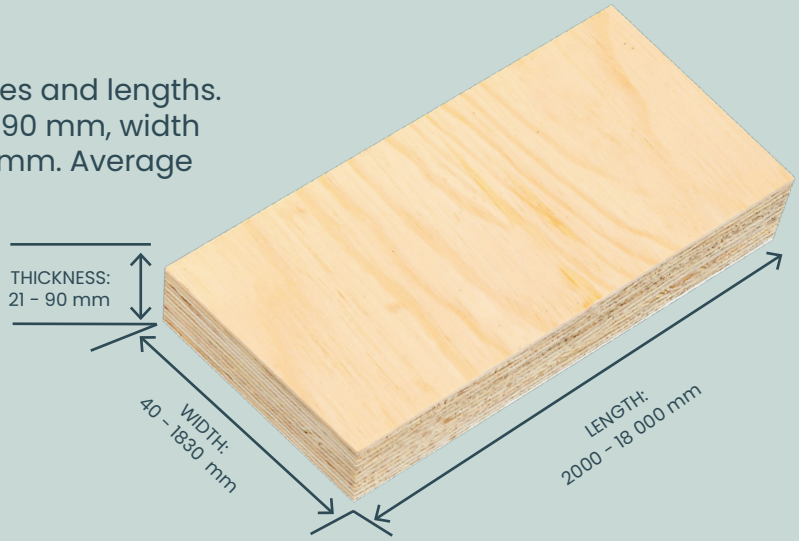


In industrial, storage, sports and similar buildings, LVL can be used as:

① portal frames (LVL-P/C),
② truss elements (LVL-P/C),
③ columns (LVL-P),
④ one and more span purlins (LVL-P),
⑤ lintels (LVL-P/C),
⑥ bracing panels for walls (LVL–C),
⑦ horizontal wall beams (LVL –P),
⑧ bracing panels for roofs (LVL–C),
⑨ wall stud (LVL–C).
At the same time it is really good material for bridge constructions, wind turbine towers and etc.



Technical characteristics:
Products are available in various sizes and lengths. Marginal dimensions: thickness 21 - 90 mm, width 40 - 1830 mm, length 2000 - 18 000 mm. Average density 600-602 kg/m³.



UN CPC code:
3143

Geographical scope:
Europe

LCA INFORMATION

DECLARED UNIT:
The declared unit is 1 m^3 of laminated veneer lumber (LVL) for construction with an average density of 610 kg/m^3.

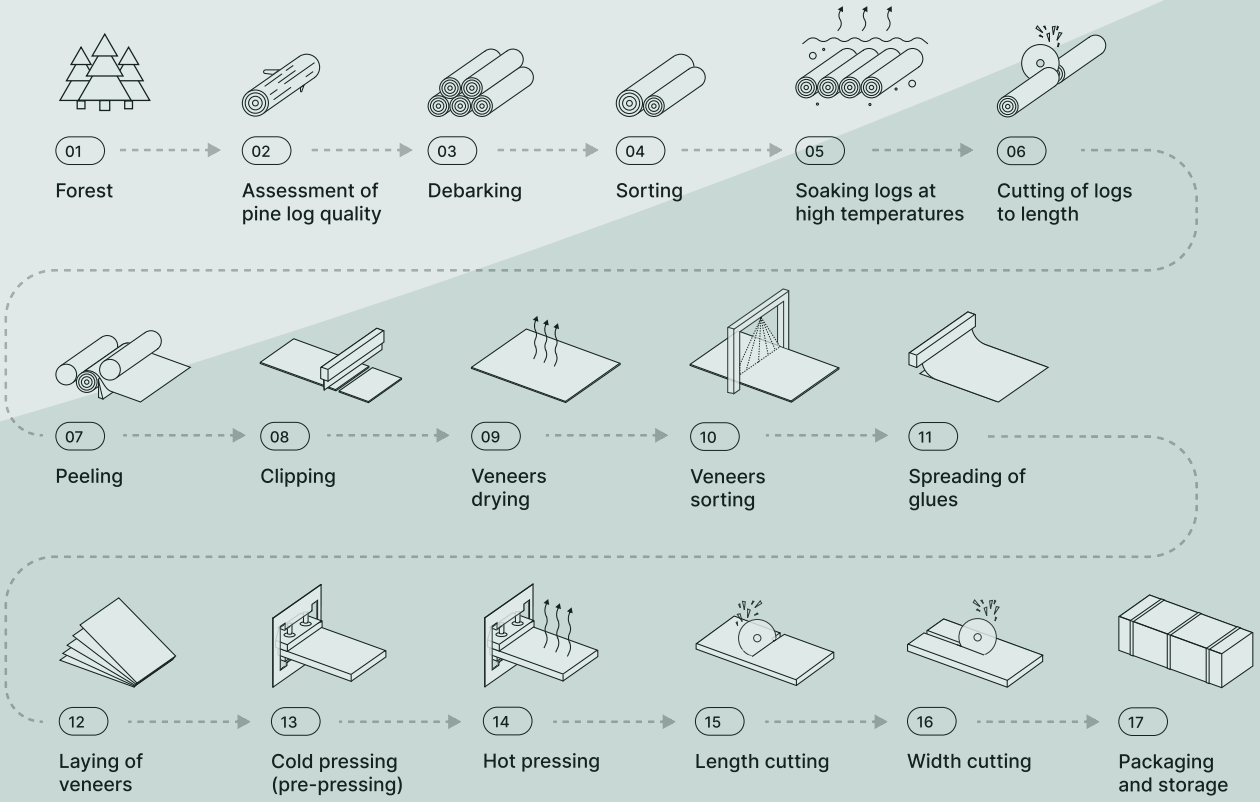
REFERENCE SERVICE LIFE:
The service life is the same as for the building, and it is usually set at 60 years.

TIME REPRESENTATIVENESS:
Primary data was collected internally. Reporting year – 2024, this is the last full year.

DATABASE(S) AND LCA SOFTWARE USED:
The Ecoinvent database v.3.10.1 provides the life cycle inventory data for the raw and process materials obtained from the background system. The LCA software used is One Click LCA. The Characterization Factors used in this report is based on Environmental Footprint (EF) 3.1.

DESCRIPTION OF SYSTEM BOUNDARIES:
This EPD covers the cradle to gate with options scope with the following modules; A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary is included.

SYSTEM DIAGRAM:



Modules declared, geographical scope, the share of specific data (in GWP-GHG results) and data variation:

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X
Geography	EU	EU	LT	EU	-	-	-	-	-	-	-	-	EU	EU	EU	EU	EU
Specific data used	3,07%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Description of the system boundary (X = Included in LCA; MND = Module Not declared)

*Module A5 is declared only for "balancing-out reporting" since part of the product packaging contains more than 5% biogenic carbon.

DATA QUALITY:

The foreground data collected internally is based on yearly production amounts and extrapolations of measurements on specific machines and plants. Overall, the data quality can be described as good. The primary data collection has been done thoroughly.

CUT-OFF CRITERIA:

fe cycle inventory data for a minimum of 99% of total material and energy input flows have been included in the life cycle analysis. However, only materials having in summa less than 1% of the weight of the product were not used in calculations.

PRODUCT STAGE:

A1: This module considers the extraction and processing of raw materials and energy consumption. Softwood logs are delivered to manufacture from sustainable managed forests (license code: FSC®-C166244).

A2: The raw materials are transported to the manufacturing plant. In this case, the model includes road transportation of each raw material.

A3: This module includes the manufacture of products and packaging. It also considers the energy consumption and waste generated at the production plant.

PRODUCTION PROCESS DESCRIPTION

VMG LIGNUM LVL is made of rotary peeled and strength graded softwood veneers, that are produced by the same factory from round softwood logs. The dried veneers are bonded with weather and boil-resistant phenol formaldehyde adhesive. All veneer layers are laid in pressing line according to recipe of product and by using cold press formed them into the form of panel. Formed panels finally glued into product in hot press, after which big panels are processed into delivery formats. In each stage quality control are ensured.

CONSTRUCTION PROCESS STAGE:

A4: This module includes transport from the production gate to the construction site where the product shall be installed. The transportation doesn't cause losses as products are packaged properly.

A5: This EPD does not cover the Installation module. However, module A5 is declared for "balancing-out reporting" since part of the packaging of products contains more than 5% biogenic carbon. The uptake of this biogenic carbon, as biogenic CO2, in module A1 shall be balanced out by an equal amount of emission of biogenic CO2 in module A5.

Use stage: Not declared.

END OF LIFE STAGE:

C1: This module includes product deconstruction, dismantling, and demolition. Consumption of fuel in the demolition process is calculated according to transported mass. Energy consumption for demolition is assumed to be 0,150 kWh for 1 m3 (Bozdağ, Ö & Seçer, M (2007) and the Level(s) project). The source of energy is diesel fuel used by construction machinery.

C2: Transport of the discarded product to the processing site. It is estimated that there is no mass loss during the use of the product, therefore, the end-of-life product is assumed that it has the same weight as the declared product. All the end-of-life product is assumed to be sent to the closest facilities, such as recycling. Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is lorry which is the most common.

C3: Waste processing for reuse, recovery and/or recycling. Wood is a highly recyclable material; it is assumed that 100% of the product is collected separately at demolition site and send directly to incineration facility with energy recovery.

C4: It is assumed that 100% of the product is collected at the construction site and sent for incineration, so no input in module C4.

BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D):

The benefits of recyclable waste generated in module C3 are considered in module D. The heat production as a benefit when the product is incinerated in module C3 is considered.

CONTENT INFORMATION

Product components	Weight per DU,kg	Post-consumer material, weight-%	Renewable material, weight-%
Softwood (pine)	409,30	0	67,10
Hardwood (birch)	114,50	0	18,76
Adhesives	85,01	0	0
Others	1,19	0	0
Total	**610**	**0**	**85,86**

Packaging materials	Weight per DU, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C
Cardboard	0,08	0,01	0,02
Eur-flat pallet	6,1	1	0
Plastic	0,77	0,12	2,06
Total	**6,95**	**1,14**	**2,08**

Product water content – 10 ±2%.

No dangerous substances from the candidate list of SVHC for Authorisation are present in concentrations greater than 0.1% by weight in the product.

RESULTS OF THE ENVIRONMENTAL PERFORMANCE INDICATORS

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. NB: it is discouraged to use the results of modules A1-A3 without considering the results of module C when module C is declared.

MANDATORY IMPACT CATEGORY INDICATORS ACCORDING TO EN 15804+A2, EF1

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2e	-7,32E+02	3,58E+01	7,67E+00	5,41E-02	3,28E+00	1,61E+03	0,00E+00	-2,56E+02
GWP-fossil	kg CO_2e	3,87E+02	3,58E+01	ND	5,41E-02	3,28E+00	9,47E+00	0,00E+00	-2,56E+02
GWP-biogenic	kg CO_2e	-1,12E+03	7,92E-03	7,67E+00	0,00E+00	0,00E+00	1,61E+03	0,00E+00	0,00E+00
GWP-luluc	kg CO_2e	7,96E-01	1,61E-02	ND	5,54E-06	1,47E-03	2,62E-03	0,00E+00	-2,16E-02
ODP	kg CFC_{-11}e	1,09E-05	5,27E-07	ND	8,28E-10	4,85E-08	1,06E-07	0,00E+00	-7,61E-06
AP	mol H^+e	1,49E+00	1,81E-01	ND	4,88E-04	1,12E-02	9,83E-02	0,00E+00	-3,01E-01
EP-freshwater	kg Pe	-2,63E+01	2,67E-03	ND	1,56E-06	2,56E-04	4,10E-03	0,00E+00	-5,62E-03
EP-marine	kg Ne	3,30E-01	5,44E-02	ND	2,26E-04	3,68E-03	5,22E-02	0,00E+00	-1,08E-01
EP-terrestrial	mol Ne	3,49E+00	5,95E-01	ND	2,48E-03	4,00E-02	5,01E-01	0,00E+00	-1,16E+00
POCP	kg NMVOCe	2,15E+00	2,19E-01	ND	7,39E-04	1,65E-02	1,26E-01	0,00E+00	-6,84E-01
ADP - minerals &metals*	kg Sbe	3,31E-03	9,55E-05	ND	1,94E-08	9,16E-06	1,94E-05	0,00E+00	-2,24E-04
ADP-fossil*	MJ	8,57E+03	5,14E+02	ND	7,07E-01	4,76E+01	8,39E+01	0,00E+00	-4,04E+03
WDP*	m^3e depr.	1,07E+02	2,47E+00	ND	1,77E-03	2,35E-01	1,99E+01	0,00E+00	-1,75E+01

Acronyms

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 = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP – minerals & metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Reading example: 6,42E-1 refers to 0,642.

ADDITIONAL MANDATORY IMPACT CATEGORY INDICATORS - GWP-GHG*

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG	kg CO2e	3,88E+02	3,58E+01	ND	5,41E-02	3,28E+00	9,48E+00	0,00E+00	-2,56E+02
Particulate matter	Incidence	1,82E-05	3,42E-06	ND	1,39E-08	3,29E-07	1,10E-06	0,00E+00	-1,23E-06
Ionizing radiation[4)]	kBq U235e	2,22E+01	4,35E-01	ND	3,13E-04	4,15E-02	9,56E-02	0,00E+00	-1,29E+00
Ecotoxicity (freshwater)	CTUe	5,01E+03	7,08E+01	ND	3,89E-02	6,74E+00	6,43E+01	0,00E+00	-1,20E+02
Human toxicity, cancer	CTUh	8,51E-07	6,00E-09	ND	5,56E-12	5,42E-10	1,77E-08	0,00E+00	-2,89E-08
Human tox. non-cancer	CTUh	3,53E-06	3,21E-07	ND	8,80E-11	3,08E-08	1,19E-06	0,00E+00	-4,27E-07
SQP[5)]	-	1,11E+05	4,92E+02	ND	4,96E-02	4,80E+01	2,35E+01	0,00E+00	-1,04E+02

RESOURCE USE INDICATORS

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	9,90E+03	6,86E+00	ND	4,48E-03	6,53E-01	-1,03E+04	0,00E+00	-1,51E+01
PERM	MJ	8,41E+03	0,00E+00	-6,71E+01	0,00E+00	0,00E+00	-8,34E+03	0,00E+00	0,00E+00
PERT	MJ	1,83E+04	6,86E+00	-6,71E+01	4,48E-03	6,53E-01	-1,87E+04	0,00E+00	-1,51E+01
PENRE	MJ	6,01E+03	5,14E+02	ND	7,07E-01	4,76E+01	8,39E+01	0,00E+00	-4,04E+03
PENRM	MJ	2,50E+03	0,00E+00	-3,71E+01	0,00E+00	0,00E+00	-2,47E+03	0,00E+00	0,00E+00
PENRT	MJ	8,52E+03	5,14E+02	-3,71E+01	7,07E-01	4,76E+01	-2,38E+03	0,00E+00	-4,04E+03
SM	kg	2,29E+00	2,19E-01	ND	2,94E-04	2,03E-02	1,97E-01	0,00E+00	0,00E+00
RSF	MJ	2,27E+00	2,66E-03	ND	7,68E-07	2,58E-04	4,65E-04	0,00E+00	-1,10E-03
NRSF	MJ	0,00E+00	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	2,64E+00	7,37E-02	ND	4,68E-05	7,04E-03	1,22E-01	0,00E+00	-4,41E-01
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water.								

WASTE INDICATORS

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	2,11E+01	8,58E-01	ND	7,87E-04	8,07E-02	3,94E+00	0,00E+00	-2,78E+00
Non-hazardous waste	kg	5,17E+02	1,57E+01	ND	1,07E-02	1,49E+00	6,26E+02	0,00E+00	-4,78E+01
Radioactive waste	kg	5,63E-03	1,06E-04	ND	7,69E-08	1,02E-05	2,38E-05	0,00E+00	-3,19E-04

OUTPUT FLOW INDICATORS

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,50E-01	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	3,44E+00	0,00E+00	ND	0,00E+00	0,00E+00	6,10E+02	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

INFORMATION ON BIOGENIC CARBON CONTENT

Results per declared unit		
Biogenic carbon content	**Unit**	**Quantity**
Biogenic carbon content in product	kg C	2,36E+02
Biogenic carbon content in packaging	kg C	2,08E+00

SCENARIO DOCUMENTATION

MANUFACTURING ENERGY SCENARIO DOCUMENTATION

Scenario parameter	GWP (A1-A3) value	Source
Green electricity Lithuania (modelled based on GO): 48% hydro 43% wind 14% solar 18% biomass	0,021 kg CO_2 e/kWh	Electricity production, hydro, run-of-river (Reference product: electricity, high voltage). Lithuania. Ecoinvent 3.10.1 Electricity production, wind, >3mw turbine, onshore (Reference product: electricity, high voltage) Lithuania. Ecoinvent 3.10.1 Electricity production, photovoltaic, 3kwp slanted-roof installation, multi-si, panel, mounted (Reference product: electricity, low voltage) Lithuania. Ecoinvent 3.10.1 Heat and power co-generation, wood chips, 6667 kw (Reference product: electricity, high voltage) Lithuania. Ecoinvent 3.10.1 Green electricity, One Click LCA
Heat generation	0.0524 kg CO_2e / kWh	Heat and power co-generation, wood chips, 6667 kW (Reference product: electricity, high voltage) Ecoinvent 3.10.1
Diesel for forklifts	0.1 kg CO_2e / MJ	Market for diesel, burned in building machine (Reference product: diesel, burned in building machine) Ecoinvent 3.10.1

TRANSPORT SCENARIO DOCUMENTATION (A4)

Parameter	Value/Description
Vehicle type used for transport	EURO 5 truck with a trailer with an average load of >32t
Distance	71 % of production: Truck – 650 km. 29 % of production: Truck – 178 km; Ferry – 112 km
Capacity utilization	56 % of the capacity in volume (truck) 50% of capacity in volume (ferry)

END OF LIFE SCENARIO DOCUMENTATION

Scenario parameter	Value
Collection process – kg collected separately	610 kg
Collection process – kg collected with mixed waste	–
Recovery process – kg for re-use	–
Recovery process – kg for recycling	–
Recovery process – kg for energy recovery	610 kg
Disposal (total) – kg for final deposition	–
Scenario assumptions e.g. transportation	Dismantled product is transported 50 km

REFERENCES

General Programme Instructions of the International EPD® System. Version 4.0.

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.

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

PCR 2019:14 Construction products (version 1.2.5).

c-PCR-006 Wood and wood-based products for use in construction (EN 16485:2014) Version 2019-12-20.

Bozdağ, Ö and Seçer, M., Energy consumption of RC buildings during their life cycle. Izmir, Dokuz University (2007) and the Level(s) project.

Laminated veneer lumber (LVL) for construction from UAB Lignum Construction LCA background report. 2025 July.

DIFFERENCE VERSUS PREVIOUS VERSIONS

2023-10-10 Version 1
2024-02-06 Version 1.1.
Editorial change: changed product photos in the whole EPD
2025-07-05 Version 2
Major update: EPD recalculated for full reference year. Product composition updated. Added EoL scenario documentation. Share of specific data updated. GWP-total results have slightly changed, due to changes in product composition – hardwood is used and higher amount of resin. Additional optional results were calculated.

VMG LIGNUM CONSTRUCTION