ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Mosser Leimholz GmbH
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-MLG-20250270-IBA1-EN
Issue date	23.07.2025
Valid to	22.07.2030

Cross-laminated timber

Mosser Leimholz Gesellschaft m. b. H.

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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1. General Information

Mosser Leimholz Gesellschaft m. b. H.

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-MLG-20250270-IBA1-EN

This declaration is based on the product category rules:

Solid wood products, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

23.07.2025

Valid to

22.07.2030

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Cross-laminated timber

Owner of the declaration

Mosser Leimholz GmbH
Fohlenhof 2
3263 Randegg
Austria

Declared product / declared unit

1 m³ of cross-laminated timber with an average density of 454 kg/m³ (moisture at delivery = app. 12 %)

Scope:

This EPD is based on a declared unit of 1 m³ of average cross-laminated timber (moisture of app. 12 % at a raw density of 454 kg/m³), produced at the Mosser Leimholz Gesellschaft m.b.H. plant in Perwarth (site Randegg, Austria).

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally

Dr. Stefan Diederichs,
(Independent verifier)

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2. Product

2.1 Product description/Product definition

Mosser cross laminated timber is a panel-shaped component made of solid wood, with at least three cross-glued layers of spruce and fir wood, for load-bearing applications. The production of Mosser cross laminated timber is based on in-house and external monitoring in accordance with *ETA-23/0498*, dated 22.08.2023.

Mechanical sorting of the boards, followed by finger-jointing, produces board lamellas with largely homogeneous mechanical and visual material properties. Crosswise gluing guarantees the load-bearing capacity of the component and a high degree of dimensional stability.

Mosser cross laminated timber is produced in visual, industrial-visual and non-visual grade. All three qualities are available as standard and commission goods. With an additional joinery machine, a high degree of prefabrication can be achieved and a fully formed component can be delivered.

For the placing of the product on the market in the European Union/European Free Trade Association /EU/EFTA) (with the exception of Switzerland) the Regulation (EU) No. 305/2011 (*CPR*) applies. The product needs a declaration of performance taking into consideration *ETA-23/0498 from 22.08.2023, European technical Assessment for Mosser cross laminated timber* and the CE- marking.

For the application and use the respective national provisions apply.

Further information and the declarations of performance are available at www.mosser.at.

2.2 Application

Mosser cross laminated timber is used in the structural area of modern timber construction. The product is permitted for service classes 1 and 2 in accordance with *EN 1995-1-1*. It is used in components with predominantly static traffic loads.

2.3 Technical Data

The specified structural data is based on the requirements of *ETA-23/0498*. All data correspond to the declaration of performance.

Constructional data

Name	Value	Unit
Wood types by trade names acc. to EN 1912 & EN 13556	PCAB (Norway spruce), ABAL (silver fir)	-
Wood moisture acc. to EN 13183-2	12 ± 2	%
Compressive strength perpendicular to the grain of the boards (fc, 0, k), (mechanical actions perpendicular to CLT) acc. to ETA-23/0498	21	N/mm^2
Compressive strength perpendicular to the grain of the boards (fc, 90, k), (mechanical actions perpendicular to CLT) acc. to ETA-23/0498	2.5	N/mm^2
Tensile strength parallel to the grain of the boards (ft, 0, k), (mechanical actions in plane of CLT) acc. to ETA-23/0498	14	N/mm^2
Tensile strength perpendicular to the grain of the boards (ft, 90, k), (mechanical actions perpendicular to CLT) acc. to ETA-23/0498	0.12	N/mm^2
Modulus of elasticity parallel to the grain of the boards (E0, mean), (mechanical actions perpendicular to CLT) acc. to ETA-23/0498	12 000	N/mm^2
Modulus of elasticity parallel to the grain of the boards (E0, mean), (mechanical actions in plane of CLT)	3 layers: 10 000 5 layers: 11 500 7 layers: 12 000	N/mm^2
Shear strength parallel to the grain of the boards (fv, 090, k), (mechanical actions perpendicular to CLT) acc. to ETA-23/0498	4.0	N/mm^2
Shear strength perpendicular to the grain of the boards (fv, 9090, k), (mechanical actions perpendicular to CLT) acc. to ETA-23/0498	1.1	N/mm^2
Shear strength parallel to the grain of the boards (fv, 090, k), (mechanical actions in plane of CLT) acc. to ETA-23/0498	3.9	N/mm^2
Shear modulus parallel to the grain of the boards (G090, mean), (mechanical actions perpendicular to CLT) acc. to ETA-23/0498	690	N/mm^2
Shear modulus perpendicular to the grain of the boards (rolling shear modulus, G9090, mean), (mechanical actions perpendicular to CLT) acc. to ETA-23/0498	50	N/mm^2
Shear modulus parallel to the grain of the boards (G090, mean), (mechanical actions in plane of CLT)	460	N/mm^2
Length (min. - max.)	± 0.003	m
Width (min. - max.)	± 0.001	m
Height (min. - max.)	± 0.001	m
Gross density acc. to EN 14080	454	kg/m^3
Surface quality	visual-quality, industrial-visual quality, non-visual quality	-
Thermal conductivity acc. to ISO 10456	0.12	W/(mK)
Specific heat capacity acc. to ISO 10456	1.6	kJ/kgK
Water vapour diffusion resistance factor acc. to ISO 10456	μ = 50 (dry) - 20 (wet)	-

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *ETA-23/0498 from 22.08.2023, European technical Assessment for Mosser cross laminated timber*.

2.4 Delivery status

Mosser cross laminated timber is produced in numerous dimensions. In addition to the standard production, various profiles can be manufactured. The joinery system can also be used to offer the desired shapes/processing. The following dimensions are available:

- Width: 1000 to 1250 mm
- Height: 60 to 280 mm
- Length: 2.7 to 14 m

A detailed list of the product structure with the respective dimensions, the qualities and the various profiles can be found in the product data sheet on the homepage.

2.5 Base materials/Ancillary materials

Mosser cross laminated timber is made from at least three layers of boards glued at right angles to each other.

A one-component polyurethane adhesive (PUR) is used to bond the surface. A thermosetting two-component melamine-urea-formaldehyde resin (MUF) is used for the finger joints. The narrow sides are glued with polyvinyl acetate (PVAc dispersion glue) and a hotmelt adhesive based on copolymers of ethylene vinyl acetate (EVA). Gluing is carried out in accordance with *EN 14080:2013*, *EN 301*, *EN 302* and *EN 15425*.

One m³ of Mosser cross laminated timber consists of the materials listed with the respective percentages:

- Softwood (mostly spruce): 88.1 %
- Water: 10.7 %
- Glue system: 1.2 %

The average bulk density, at a wood moisture content of 12 %, is approx. 454 kg/m³.

This product/article/at least one partial article contains substances listed in the *candidate list* (07.11.2024) exceeding 0.1 percentage by mass: no.

This product/article/at least one partial article contains other CMR substances in categories 1A or 1B which are not on the *candidate list*, exceeding 0.1 percentage by mass: no.

Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products No. 528/2012): no.

2.6 Manufacture

The sawn timber for Mosser cross laminated timber is first kiln dried to a target moisture content of 12 ± 2 %. After drying, the sawn timber is mechanically sorted according to strength-related and visual characteristics. Areas of the boards, that do not meet the strength and visual requirements, are cut out. The boards are then finger-jointed into endless board lamellas and cut to the desired length. This production step allows a largely homogeneous component to be created. After finger-jointing, the board lamellas are planed and glued with hotmelt adhesive and polyvinyl acetate (see chapter 2.5). Right after gluing, the lamellas are pressed, to form single-layer boards. In the course of this work step, a so-called continuous carpet is produced and cut to the required dimensions. The individual layers are then

bonded crosswise to form a multi-layer panel using PUR adhesive (see section 2.5). The bonded panel is then cold-pressed to fix the mold while the adhesive dries. Next, the pressed panel is planed on four sides, profiled or, if necessary, sanded on the visual side. As final step, the Mosser cross laminated timber is cut to the desired length. Optionally, the panel can be further processed on the joinery line before packaging.

2.7 Environment and health during manufacturing

The waste water produced during production is discharged into the local sewer system as standard. Waste water that has come into contact with glue is discharged into a separate glue pit. If necessary, this pit is pumped out by a specialised company and disposed of properly.
Noise emissions from the various systems are reduced by soundproof cabins. These can only be opened when the machines are not running. Employees are also provided with hearing protection.
All production facilities are designed with an extraction system to minimise dust formation. All exhaust air is cleaned with a filter system so that no environmental pollution can occur.
All waste materials produced, such as planing and sawdust or waste wood, are further processed or thermally utilised in the company. The resulting waste is collected separately in accordance with our own waste management plan and disposed of professionally.
This ensures that there is no environmental impact on soil and water.

2.8 Product processing/Installation

Mosser cross laminated timber can be processed using machines, equipment and tools suitable for solid wood processing. The health and safety instructions must also be observed for processing and installation.

2.9 Packaging

Polyethylene (PE) films are used for the packaging of Mosser cross laminated timber. Polyethylene terephthalate (PET) strapping is used to form the packages. In addition, cardboard edge protectors are included to protect the panel edges. The packaging material can be recycled if it is collected separately.

2.10 Condition of use

The composition of Mosser cross laminated timber is described in detail in chapter 2.5. This composition applies for the entire service life of the product. During use, 200 kg of carbon is bound in one m³ of Mosser cross laminated timber. In the case of complete oxidation, this is equivalent to 733 kg of CO_2.

2.11 Environment and health during use

When Mosser cross laminated timber is used as intended, no environmentally hazardous damage to water, soil or air can occur.

Furthermore, no health hazards are to be expected from Mosser cross laminated timber. Due to the low adhesive content in the product and the general product composition, Mosser cross laminated timber is low in formaldehyde emissions (formaldehyde emission class 1). The finger joints of the Mosser cross laminated timber board lamellas subsequently emit formaldehyde. With regard to the limit of formaldehyde emission class E1, the measured test values of < 0.1 ppm HCHO/m³ air can be categorised as low in accordance with *EN 717-1*.

The MDI contained in the PUR adhesive hardens completely during bonding so that MDI emissions from the hardened cross laminated timber are no longer possible.

2.12 Reference service life

Mosser cross laminated timber has been produced and used since 2023. The raw material used and the underlying manufacturing process for Mosser cross laminated timber is the same as for Mosser glulam.

Glulam in general has been used for over 100 years. When used as intended, no end to its durability is known or expected. The service life of Mosser cross laminated timber corresponds to that of Mosser glulam and can therefore be assumed to be the same as the service life of the building.

2.13 Extraordinary effects

Fire

Mosser cross laminated timber is assigned to fire class D-s2-d0 in accordance with *EN 14080:2013*.

Fire protection

Name	Value
Building material class	D
Smoke gas development	s2
Burning droplets	d0

The burning rate is regulated in Eurocode 5 (*EN 1995-1-2*) and set at 0.7 mm/min.

Water

No ingredients are washed out that could cause environmentally hazardous properties in water.

Mechanical destruction

Mosser cross laminated timber is manufactured exclusively from solid wood. The fracture behavior of the product is therefore identical to that of solid wood.

2.14 Re-use phase

In the case of selective deconstruction, cross laminated timber can easily be reused after the end of the utilization phase.
If Mosser cross laminated timber cannot be reused after the primary use phase, it is sent for thermal utilization to generate heat and electricity due to its high calorific value of approximately 19 MJ/kg, *ÖNORM M 7132*.

2.15 Disposal

Landfilling of waste wood is not permitted. Waste wood must be assigned to waste type SN 17201 'Wood packaging and wood waste, uncontaminated' with the specification 01 in accordance with the *Abfallverzeichnisverordnung (AVVO) BGBl. II Nr. 409/2020*.

2.16 Further information

Further information can be found at www.mosser.at.

3. LCA: Calculation rules

3.1 Declared Unit

This EPD refers to a declared unit of 1 m³ of cross-laminated timber produced by Mosser. The declared unit refers to an average density of 454 kg/m³ and a wood moisture at delivery of app. 12 %.

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	m^3
Gross density	454	kg/m^3
Wood moisture at delivery	12	%

The present study includes a declaration of average products from a manufacturer's factory. The production line for cross-laminated timber is located at the plant in Perwarth which is part of the Randegg production site.

The declared average includes all cross-laminated timber products. The therefore calculated average refers to the entire cross-laminated timber production of Mosser at Randegg (100 %). As a result, all available dimensions and qualities are part of the average. The declared average includes the total annual input of wood in relation to all cross-laminated timber produced in the reference year. In the production process, it is not possible to allocate input and output flows to individual variants. The robustness of the declared LCA values can be categorised as good.

3.2 System boundary

The life cycle assessment of average cross-laminated timber produced by Mosser refers to a cradle-to-gate analysis of the environmental impacts with modules C1–C4 and module D (A1–A3 + C + D). The following life cycle phases are part of the analysis:

Module A1–A3 | Production stage
The production stage includes the upstream burdens of raw material supply, their transports, and the manufacturing plant of Mosser in Randegg (Austria). Main raw material inputs therefore refer to sawn timber and the production of the adhesive system. Within the plant boundaries the sorting, drying, fingerjointing, pressing and planing as well as the packaging of the product are considered. The production site is supplied with internally produced thermal energy from the company's own biomass power plant. At the moment, green electricity is purchased at site. As there is no longterm contract ensuring the provision of green electricity for the validity period of the EPD, the LCA considers the residual electricity mix (0.5 kg CO_2e/kWh). Direct emissions from drying are based on worst-case assumptions and are included in the study. The packaging of the products is considered in module A1–A3 as well.

Module C1 | Deconstruction and demolition
After the removal of building components overlying the product, the joints can simply be loosened by screwing or sawing and lifted by cranes to the place of removal. Required energy demand can be neglected. The actual energy demand depends on the installation of the products and can therefore vary greatly in the building context.

Module C2 | Transport to disposal
Module C2 includes the transport to waste treatment. In this case, transport by truck over a transport distance of 50 km is assumed.

Module C3 | Waste processing
In Module C3, the chipping after the removal of the products is considered. The wooden products and with them the materialinherent properties leave the product system as secondary combustibles in module C3.

Module C4 | Disposal
The applied scenario declares the energetic recovery of the wooden products, therefore no environmental impacts are to be expected from waste processing of the products in C4.

Module D | Benefits and loads beyond the system boundary Applying an European average scenario, module D describes the energetic recovery of the product at the end of life including the corresponding energy substitution potentials.

3.3 Estimates and assumptions

All assumptions are verified through detailed documentation and correspond to the best possible representation of reality based on the available data.

Regional applicability of the used background data refers to average data under European or German conditions taken from the *MLC*-database. German data were used for the Austrian market whenever European or regionalised average data were not available. Emissions from wood drying were included in the calculations according to *Rüter & Diederichs 2012*.

3.4 Cut-off criteria

The LCA model covers all available input and output flows, which can be represented based on robust data and from which a significant contribution can be expected. Data gaps are filled with conservative assumptions of average data or generic data if available and are documented accordingly. Only data with a contribution of less than 1 % were cut off. Thus, no data were neglected, of which a substantial impact is to be expected. All relevant data were collected comprehensively. Cutoff material- and energy flows were chosen carefully based on their expected quantitative contribution as well as potential environmental impacts. Thus, it can be assumed that the sum of all neglected input flows does not account for more than 5 % of the total material, water and energy flows. Environmental impacts of machines, plant and infrastructure were not included.

3.5 Background data

This study uses generic background data for the evaluation of upstream environmental impacts from *MLC* 2024.2 database in the *LCA FE*-software -version 10, as well as recognised literature such as *Rüter & Diederichs 2012*.

3.6 Data quality

Data collection is based on product- specific questionnaires. It follows an iterative process of clarifying questions via e-mail, telephone calls or in personal/web meetings. Intensive discussions between Mosser and Daxner & Merl result in anaccurate mapping of product-related material and energy flows. This leads to a high quality of foreground data collected. Data collection relies on a consistent process according to *ISO 14044*.

The technological, geographical and time--related representativeness of the database was kept in mind when selecting background data. Whenever specific data were missing, either generic datasets or representative average data were used instead. The implemented *MLC*-background datasets refer to the latest versions available and are carefully chosen (not older than ten years, except for the LCIs published by Rüter & Diederichs and the dataset for the forklifter).
The assessment of the robustness of the average can be found in Section 3.1.

3.7 Period under review

Foreground data were collected in the production year 06.2023-05.2024, and the data are based on the volumes produced on an annual basis.

3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Austria

3.9 Allocation

Carbon content and primary energy content of the products were assessed based on their material inherent properties according to underlying physical relationships.

The production of the declared products generates co-products such as briquettes, rejects and saw dust, which are sold externally. The environmental impact of the production is allocated to the main and the co-products based on their market value in line with the recommendations according to *EN 16485*.

Cross-laminated timber as well as glued laminated timber are produced at the Mosser plant in Perwarth. Main energy- and material flows are reported separately for the two products. Packaging, auxiliaries, glue residues, wood chips and wooden briquettes were allocated based on the production quantities (cubic meters).

3.10 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

The *MLC* 2024.2 background database in the *LCA FE*-software-version 10 was used to calculate the LCA.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

During tree growth, the wood assimilates carbon dioxide and stores biogenic carbon. The carbon stored in the product is declared in the following table.
Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	200	kg C
Biogenic carbon content in accompanying packaging	0.03	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

Installation into the building (A5)

The end of life of the product packaging is not declared in module A5.

Name	Value	Unit
Packaging (Polyethylene)	0.588	kg
Packaging (Polyethylene terephthalate)	0.090	kg
Packaging (Cardboard)	0.065	kg

The end--of--life scenario used in this LCA study is based on the following assumptions:

End of life (C1-C4)

Name	Value	Unit
Energy recovery	454	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Name	Value	Unit
Processing rate	100	%
Efficiency of power plant	68	%

The product reaches the end-of-waste status after removal from the building, transport to processing and chipping of the product. For the end of life of the cross-laminated timber product, energy recovery as secondary fuel in a biomass powerplant is assumed. As the main sales market for the solid wood products is concentrated in the European region, plant specific characteristic values correspond to a European average scenario (EU). The scenario considers a reprocessing rate of 100 % for the solid wood products after removal from the building. This assumption has to be adjusted accordingly when applying the results in the building context. At the end of life of the product, the equilibrium moisture is comparable to the moisture content at delivery. This value can vary depending on the storage of the product before energy recovery.

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5. LCA: Results

The following table contains the LCA results for a declared unit of 1 m³ of cross-laminated timber produced by Mosser (454 kg/m³).

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction 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
X	X	X	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m³ cross-laminated timber (454 kg/m³)

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 eq	-6.23E+02	0	1.75E+00	7.36E+02	0	-3.57E+02
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	1.07E+02	0	1.72E+00	2.72E+00	0	-3.46E+02
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	-7.31E+02	0	4.1E-03	7.33E+02	0	-1.15E+01
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	3.21E-01	0	2.89E-02	4.12E-04	0	-3.39E-02
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	3.35E-08	0	2.53E-13	6.15E-11	0	-3.72E-09
Acidification potential of land and water (AP)	mol H^+ eq	6.71E-01	0	6.09E-03	5.25E-03	0	3.62E-01
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	2.23E-03	0	7.34E-06	1.13E-05	0	-6.89E-04
Eutrophication potential aquatic marine (EP-marine)	kg N eq	2.66E-01	0	2.83E-03	1.31E-03	0	4.59E-02
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	2.68E+00	0	3.17E-02	1.37E-02	0	5.6E-01
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	7.5E-01	0	5.82E-03	3.46E-03	0	2.21E-01
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	5.78E-05	0	1.5E-07	5.08E-07	0	-3.46E-05
Abiotic depletion potential for fossil resources (ADPF)	MJ	1.83E+03	0	2.26E+01	5.7E+01	0	-6.32E+03
Water use (WDP)	m^3 world eq deprived	2.23E+01	0	2.66E-02	7.5E-01	0	-2.02E+01

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m³ cross-laminated timber (454 kg/m³)

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	2.14E+03	0	1.95E+00	4.11E+01	0	-2.49E+03
Renewable primary energy resources as material utilization (PERM)	MJ	7.4E+03	0	0	-7.4E+03	0	0
Total use of renewable primary energy resources (PERT)	MJ	9.54E+03	0	1.95E+00	-7.36E+03	0	-2.49E+03
Non renewable primary energy as energy carrier (PENRE)	MJ	1.7E+03	0	2.26E+01	5.7E+01	0	-6.32E+03
Non renewable primary energy as material utilization (PENRM)	MJ	1.3E+02	0	0	-1.02E+02	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	1.83E+03	0	2.26E+01	-4.53E+01	0	-6.32E+03
Use of secondary material (SM)	kg	0	0	0	0	0	0
Use of renewable secondary fuels (RSF)	MJ	0	0	0	0	0	7.4E+03
Use of non renewable secondary fuels (NRSF)	MJ	0	0	0	0	0	1.02E+02
Use of net fresh water (FW)	m^3	8.44E-01	0	2.17E-03	3.15E-02	0	-1.32E+00

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m³ cross-laminated timber (454 kg/m³)

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	5.51E-05	0	8.67E-10	8.23E-08	0	-5.02E-06
Non hazardous waste disposed (NHWD)	kg	3.08E+00	0	3.7E-03	4.7E-02	0	6.42E-02
Radioactive waste disposed (RWD)	kg	1.08E-01	0	4.13E-05	9.1E-03	0	-5.5E-01
Components for re-use (CRU)	kg	0	0	0	0	0	0
Materials for recycling (MFR)	kg	0	0	0	0	0	0
Materials for energy recovery (MER)	kg	0	0	0	4.54E+02	0	0
Exported electrical energy (EEE)	MJ	0	0	0	0	0	0
Exported thermal energy (EET)	MJ	0	0	0	0	0	0

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m³ cross-laminated timber (454 kg/m³)

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Incidence of disease due to PM emissions (PM)	Disease incidence	ND	ND	ND	ND	ND	ND

Human exposure efficiency relative to U235 (IR)	kBq U235 eq	ND	ND	ND	ND	ND	ND
Comparative toxic unit for ecosystems (ETP-fw)	CTUe	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (carcinogenic) (HTP-c)	CTUh	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	ND	ND	ND	ND	ND	ND
Soil quality index (SQP)	SQP	ND	ND	ND	ND	ND	ND

The additional and optional impact categories according to *EN 15804+*A2 are not declared, as the uncertainty of these indicators is to be classified as high.

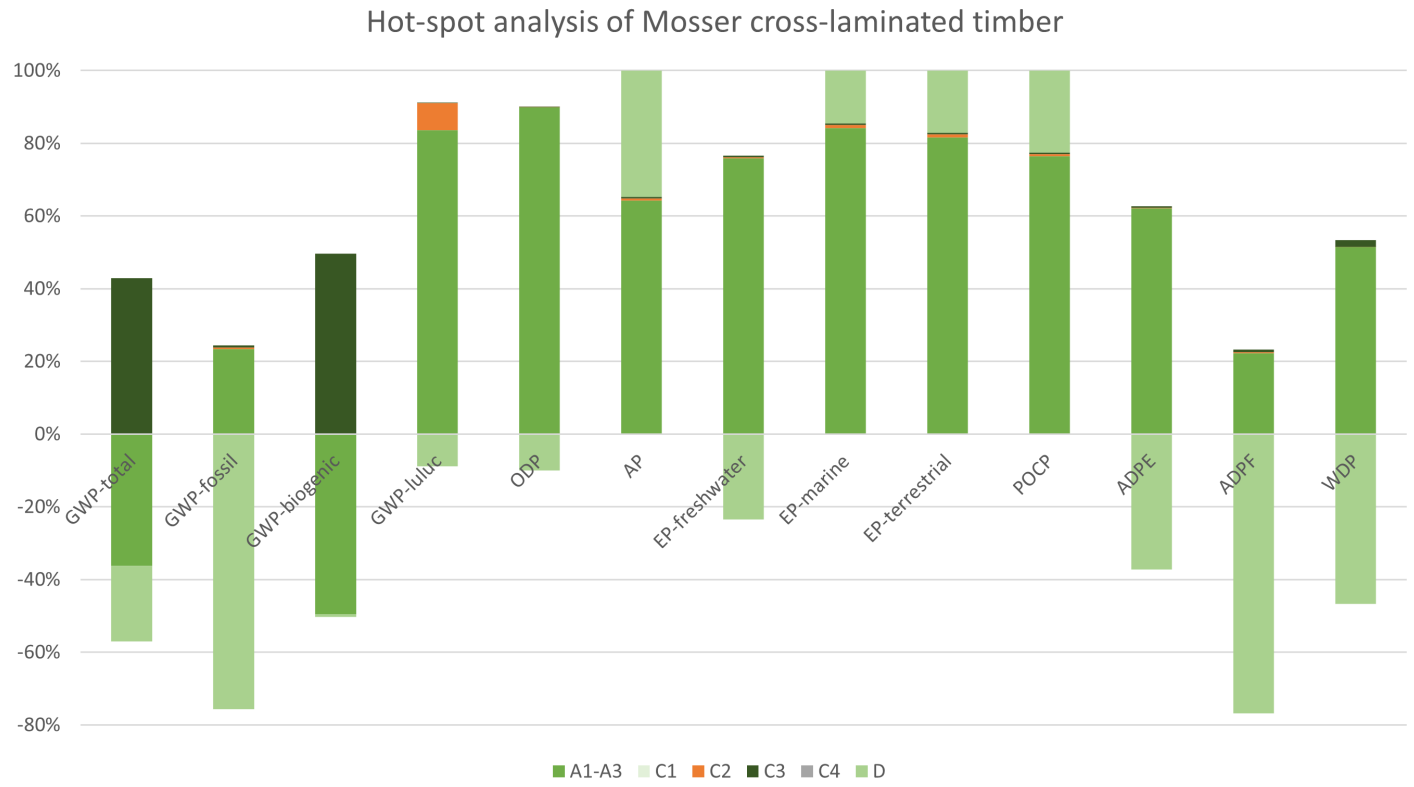
Disclaimer 1 – for the indicators 'abiotic depletion potential for non--fossil resources', 'abiotic depletion potential for fossil resources', 'water (user) deprivation potential, deprivation- weighted water consumption'. The results of this environmental impact indicators shall be used with care as the uncertainties on these results are high as there is limited experience with the indicators.

6. LCA: Interpretation

The following interpretation contains a summary of the LCA results referenced to a declared unit of 1 m³ of Mosser cross-laminated timber.

The global warming potential (GWP) of Mosser cross-laminated timber shows negative values in the production phase (**modules A1–A3**). These negative impacts results from the use of wood as raw material. Wood sequesters biogenic carbon during tree growth. The sequestered carbon does not contribute to global warming as long as it is stored in the biomass. After its use in the building, the product is assumed to be incinerated in a biomass power plant. As a result, the incorporated carbon is emitted again to the atmosphere representing biogenic carbon dioxide emissions (**module C3**).

The negative values in the end-of-life (**module D**) result from the energetic treatment of the product. As the energy produced at the biomass power plant can substitute (mainly fossil) fuels, an environmental net benefit is generated.



Potential global warming (GWP) from the production of Mosser cross-laminated timber (module A1–A3) mainly results from the upstream supply chain of the wood processed in Randegg. In addition, the environmental backpack of the adhesives used for production as well as electricity consumption represent an important driver in the environmental profile of the products.

For all indicators considered, with the exception of the depletion potential of the stratospheric ozone layer (ODP) and the abiotic depletion potential for non fossil resources (ADPE), the upstream chain of the purchased wood can be identified as the major driver. ODP and ADPE are mainly influenced by the adhesive system used.

Total use of renewable primary energy resources (PERT) is mainly influenced by the wood used as a material. Total use of non-renewable primary energy resources (PENRT) is mainly influenced by the upstream chain of the lamellas and glue used.

The declared results are representative for Mosser cross-laminated timber. They refer to an annual average of the total production volume of Mosser including all available dimensions (width, height, length) and strength classes. The average considers the annual input quantity of wood and adhesives for all variants of Mosser cross-laminated timber. All products undergo the same manufacturing process. Due to this fact and the homogeneous structure of the products, the declared results are expected to be representative for all products. A product-specific allocation of annual input and output flows is

not possible.

7. Requisite evidence

7.1 Formaldehyde
Measuring point
BASF - Türmerleim GmbH
Arnulfstraße 43, 67061 Ludwigshafen/Rhein, Germany

Test report and test date
Test report: E-CMP/KT - F206
Test date: 25.03.2025

Measurement method and result
Determination of formaldehyde release according to the test chamber method in accordance with *EN 717-1*.

Test result
The formaldehyde emission of Mosser cross laminated timber is 0.012 ppm and therefore corresponds to formaldehyde class E1 (< 0.1 ppm).

7.2 MDI
When bonding the single-component polyurethane adhesive, the adhesive cross-links by reacting with water. This reaction does not need heat. This reaction causes the MDI contained in the adhesive to harden completely. This means that MDI can no longer be released from the cured cross laminated timber.

7.3 Fire gas toxicity
The toxicity of the combustion gases produced when cross laminated timber burns, corresponds to those produced when untreated wood burns.

7.4 VOC emissions
Measuring point
Holzforschung Austria – Austrian Society for Wood Research
Gewerbegebiet 6, A2100 Stetten

Test report and test period
Test report: 16356/2025 - KW
Test period: 18.03.-19.05.2025

Measurement methodology and result
Measurement of the emissions of a sample with regard to VOC, formaldehyde and short-chain carbonyl compounds according to *EN 16516*.

AgBB overview of results (28 days)

Name	Value	Unit
TVOCspec (incl. SVOC with LCI)	532	µg/m^3
TSVOC (SVOC without LCI)	n.d.	µg/m^3
Carcinogenic Substances	n.d.	µg/m^3
R (dimensionless)	0.56	-
Sum VOC without LCI	n.d.	µg/m^3

n.d. ... not detected

AgBB overview of results (3 days)

Name	Value	Unit
TVOCspec (incl. SVOC with LCI)	903	µg/m^3
TSVOC (SVOC without LCI)	-	µg/m^3
Carcinogenic Substances	n.d.	µg/m^3
R (dimensionless)	-	-
Sum VOC without LCI	n.d.	µg/m^3

n.d. ... not detected

8. References

Standards

EN 301
ÖNORM EN 301:2023-02, Adhesives, phenolic and aminoplastic, for load-bearing timber structures – Classification and performance requirements.

EN 302-1
ÖNORM EN 302-1:2023-02, Adhesives for load-bearing timber structures – Test methodes, Part 1: Determination of longitudinal tensile shear strength.

EN 717-1
EN 717-1:2004, Wood-based panels – Determination of formaldehyde release – Part 1: Formaldehyde emission by the chamber method.

EN 1912
ÖNORM EN 1912:2024-07, Structural Timber – Strength classes – Assignment of visual grades and species.

EN 1995-1-1
ÖNORM EN 1995-1-1:2023-08, Eurocode 5: Design of timber structures- Part 1-1: General – Common rules and rules for buildings.

EN 1995-1-2
ÖNORM EN 1995-1-2:2011-09, Eurocode 5: Design of timber structures- Part 1-2: General – Structural fire design.

EN 13183-1
ÖNORM EN 13183-1:2002 + AC:2003, Moisture content of a piece of sawn timber, Part 1: Determination by oven dry method.

EN 13556
ÖNORM EN 13556:2003, Round and sawn timber – Nomenclature of timbers used in Europe.

EN 14080
EN 14080:2013-06, Timber structures – Glued laminated timber and glued solid timber – Requirements.

EN 15425
ÖNORM EN 15425:2023-02, Adhesives – One component polyurethabe (PUR) for load-bearing timber structures – Classification and performance requirements

EN 15804
DIN EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works -Environmental product declarations - Core rules for the product category of construction products.

EN 16485
DIN EN 16485:2014-07, Round and sawn timber - Environmental Product Declarations - Product category rules for wood and wood-based products for use in construction.

EN 16516
ÖNORM EN 16516:2017 + A1:2020-07, Construction products:

Assessment of release of dangerous substances - Determination of emissions into indoor air

ETA-23/0498
ETA-23/0498 from 22.08.2023, European technical Assessment for Mosser cross laminated timber

ISO 10456
EN ISO 10456:2007-12 + AC:2009-12, Building materials and products – Hygrothermal properties – Tabulated design values and procedures for determining declared and design thermal values – Technical Corrigendum 1

ISO 14025
DIN EN ISO 14025:2011-10, Environmental labels and declarations – Type III environmental declarations – Principlesand procedures.

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ÖNORM M 7132
ÖNORM M 7132:2016, Energy-economical utilization of wood and bark as fuel – Terms, definitions ad properties.

Further literature

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ECHA-Candidate List
Candidate List of substances of very high concern for Authorisation (published in accordance with Article 59(10) of the REACH Regulation).

EU-Construction Products Regulation
Regulation (EU) No. 305/2011 of the european parliament and of the council laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC dated 09.03.2011.

Holzforschung Austria
Holzforschung Austria, Emissionsmessung einer Probe gemäß EN 16516 (21.05.2025), Nr. 16356/2025 - KW

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General instructions for the EPD program of Institut Bauen und Umwelt e.V. (IBU). Version 2.0, Berlin: Institut Bauen undUmwelt e.V., 2021. www.ibu-epd.com

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Product category rules for building-related products and services. Part A: Calculation rules for the life cycle assessment and requirements for the project report in accordance with EN 15804+A2:2019. Version 1.4. Berlin: Institut Bauen und Umwelte.V. (eds.), 2024.

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