ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	Fritz EGGER GmbH & Co. OG
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-EGG-20240403-IBD2-EN
Issue date	19.12.2024
Valid to	18.12.2029

EGGER OSB boards

Fritz EGGER GmbH & Co. OG

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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1. General Information

Fritz EGGER GmbH & Co. OG

Programme holder

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

Declaration number

EPD-EGG-20240403-IBD2-EN

This declaration is based on the product category rules:

Wood-based panels, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

19.12.2024

Valid to

18.12.2029

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

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

EGGER OSB boards

Owner of the declaration

Fritz EGGER GmbH & Co. OG
Weiberndorf 20
6380 St. Johann in Tirol
Austria

Declared product / declared unit

1 cubic metre average OSB board (611 kg/m³)

Scope:

This document refers to OSB boards for construction purposes, which are manufactured in the following plants of the Egger Group:
Egger Holzwerkstoffe Wismar GmbH & Co. KG, Am Haffeld 1, 23970 Wismar, Germany
SC EGGER România SRL Str. Austriei 2. PO Box 38 725400 Radauti, jud. Suceava, Romania

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

Florian Gehring,
(Independent verifier)

2. Product

2.1 Product description/Product definition

EGGER OSB boards (Oriented Strand Boards) are synthetic resin-bonded, three-layer wood-based panels made from oriented strand boards (micro-veneers) in accordance with EN 300 Boards made of long, slender, aligned chips (OSB). The orientation of the middle layer is thereby at a right angle to the surface layers. Softwood is mainly used (spruce, pine), as well as up to 30% hardwood.

Regulation (EU) no. 305/2011 (CPR) applies to bringing the product into circulation in the EU/EFTA (with the exception of Switzerland). The products require a declaration of performance in accordance with EN 13986:2004+ A1:2015 Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking, and CE marking. Trade names used:
EGGER OSB 2 E0 / OSB 2 ENF / OSB 3 / OSB 3 E0
EGGER OSB 3 TOP / OSB 4 TOP
OSB/3 ECS
EGGER Ergo Board
EGGER Roofing Board
EGGER Structural Flooring
EGGER OSB 3 I--joist
EGGER OS'Brace®/OS'Brace® H2

The use of the following products and trade names is subject to the respective national regulations at the place of use:
EGGER OS'Brace®/OS'Brace® H2
EGGER OS'Floor™ / OS'Floor H2
EGGER OSB 3 JAS TOP
EGGER OSB PS 2 EXP1
EGGER Structural Flooring

2.2 Application

EGGER OSB boards are used in the construction industry in non-load-bearing or load-bearing and stiffening components such as roofs, walls and ceilings in accordance with EN 1995-1-1 in use classes 1 (dry conditions) and 2 (humid conditions; under roofs). They can be a component of so-called engineered wood products (EWP) such as I- beams or box girders. Furthermore, OSB boards can be used for non- load bearing applications in interior design, drywall constructions, trade fair construction and shop fitting, as well as wood packaging and concrete formwork.

2.3 Technical Data

Declared properties for EGGER OSB boards with CE marking correspond to the Declaration of Performance (DOP) in accordance with *EN 13986:2004+A1:2015* Wood-based panels for use in construction and *EN 300:2006* Oriented Strand Boards (OSB). For further information see: www.egger.com

Furthermore, national provisions apply according to *JAS Standard* MAFF Notification No. 664, Structural Panels for EGGER OSB 3 JAS TOP, according to *AS/NZS 1604* Preservative- treated wood-based products for EGGER OS'Brace® H2 and EGGER OS'Floor™ H2, according to *PS 2--18* Voluntary Product Standard, Performance Standard for Structural Panels for EGGER OSB PS 2 EXP 1 and EGGER Structural Flooring.

Structural engineering data

The specified performance values apply to OSB boards of technical class OSB/3 and OSB/4

Name	Value	Unit
Gross density acc. to EN 323	580 - 650	kg/m^3
Bending strength (longitudinal) acc. toEN 789	14.8 - 25	N/mm^2
Bending strength (transverse) acc. toEN 789	7.4 - 15	N/mm^2
E-module (longitudinal) acc. toEN 789	4930 - 7000	N/mm^2
E-module (transverse) acc. toEN 789	1980 - 3000	N/mm^2
Material dampness at delivery acc. to EN 322	5 - 12	%
Thermal conductivity acc. to EN 13986	0.13	W/(mK)
Water vapour diffusion resistance factor acc. to EN ISO 12572, OSB 3 (dry/wet)	200/150	-
Sound absorption Frequency range 1000-2000 Hz acc. to EN 13986	0.25	%

The performance values of the product correspond to the declaration of performance with regard to its essential characteristics in accordance with EN 13986:2004+A1:2015.

2.4 Delivery status

EGGER OSB boards can be delivered in the following main sizes:
thickness: 6 -- 40 mm
length: (Wismar plant): 1800 -- 11500 mm
length: (Radauti plant): 2050 - 6300 mm
width: 590 -- 2800 mm
Surface: unsanded/sanded
Additional sizes and board thicknesses can be delivered upon request.
The raw densities vary depending on the board type and customer specification. Minimum order quantity: 5 t, in packages; Current information is available at www.egger.com.

2.5 Base materials/Ancillary materials

Composition of the declared average product

as delivered

Name	Value	Unit
Dry wood chips	88,5	%
Binding agent (PMDI, MUF)	3,4	%
Additives (paraffin wax, release agent)	1,2	%
Water	6,9	%

Formaldehyde-free glued EGGER OSB board types such as OSB 4 TOP, OSB 3 E0, OSB 2 E0, OSB 2 ENF, Ergo Board, Roofing Board, Structural Flooring, OSB 3 JAS TOP, OS'Brace®, OS'Brace® H2, OS'Floor H2, OSB PS 2 EXP1 consist relative to the dry OSB-board of:

- 86-89% absolutely dry wood weight; untreated, debarked roundwood (mainly softwood of the type pine and spruce, hardwood content up to max. 30 percent)
- ~ 6% water(wood moisture)
- 3-6% glue in the surface and core layer Polymeric MDI (Diphenyl methane 4,4'– Di isocyanate) is a polyuria pre- product, which is transformed during the OSB production into polyurethane and polyuria.
- ~1% paraffin wax for hydrophobisation
- <1% additive as dispersant and adhesion promoter

Formaldehyde cross-linked glued board types EGGER OSB such as OSB 2 and OSB 3 and OS'Brace® from the Radauti plant consist relative to the OSB board of:

- 80-84 % absolutely dry wood weight; untreated, debarked roundwood (mainly softwood of the type pine and spruce, hardwood content up to max. 30 percent)
- ~6 % water(wood moisture)
- 8-12% melamine-urea-formaldehyde resin (MUF) or MUF/UF.
  The aminoplastic glue sets through polycondensation during the hot pressing process.
- ~1% ammonium sulphate as hardener
- ~1% paraffin wax for hydrophobisation

Also contained in all board types with the additional designation H2:
<1% additives: according to AS/NZS 1604 as insecticide/termite protection (permethrin).

The wood origin for OSB production fulfils the legal requirements such as the *EU Timber Regulation EUTR VO(EU) 995/2010* until 31.12.2024; as well as the *EU Deforestation Regulation EUDR VO(EU) 2023/1115* in implementation for application from 01.01.2025. The certification of wood origin for EGGER OSB boards is available on request; download further information on wood origin: www.egger.com/umwelt

Chemicals legal information:
Download the current certification concerning the use of SVHC substances: www.egger.com/umwelt

1. The product/result/at least one sub-product contains substances on the *ECHA List* of substances of very high concern (date 23.01.2024) above 0.1% by weight:
   no.
2. The product/result/at least one sub-product contains other CMR substances of category 1A or 1B that are not on the *candidate list,* above 0.1 by weight % in at least one sub-product:
   no.
3. A biocidal product has been added to EGGER OSB boards with the additional labelling "H2" (Hazard class 2 according to *AS/NZS 1604*) (it is therefore a treated product within the meaning of the *Biocidal Products Regulation (EU) No. 528/2012)*.

2.6 Manufacture

1. Bark removal of roundwood
2. Chipping of the roundwood into'strands' (micro-veneers), separately for outer layer and middle layer
3. Drying strands to approx. 3-4 % residual moisture
4. Screening outer and middle layer strand portions
5. Blending outer and middle layers with resins
6. Spreading and orienting the strands on the forming machine
7. Compression of the mat of strands in a continuous press
8. Dividing and edge-trimming the OSB board strand into raw board sizes
9. Cooling of the raw board formats in the star cooler
10. Stacking into large stacks, conditioning
11. Cut-to-size, surface sanding and edge processing of the OSB boards if necessary
12. Package formation and packaging

2.7 Environment and health during manufacturing

Waste resulting from the production process is recycled or used for heat generation in neighbouring production lines so that there is no waste resulting from the core process. Both production plants have biomass power plants.
Waste water from production is treated internally and returned to the production cycle. Noise-intensive plant components such as the chip removal are encapsulated through structural measures. Both production plants are certified with a quality and environmental management system in accordance with *ISO 9001* and I*SO 14001* and the Wismar plant is certified with the *ISO 50001* energy management system. Current environmental protection measures can be found in the EGGER Sustainability Report, see www.egger.com/umwelt.

2.8 Product processing/Installation

EGGER OSB boards can be sawn, milled and planed like solid wood using conventional electrical hand tools.
Hard metal-tipped tools are recommended. The safety measures that are usual for solid wood processing must be observed (safety shoes, work gloves, if applicable dust mask). A dust mask must always be worn when using manual tools without suction. Regular clamps, nails, and screws can be used for mechanical fastening of the boards.
Construction bonding can be done with approved glues on sanded, clean, dust- and oil-free surfaces.

2.9 Packaging

Underlays made of wood-based materials, cardboard, PET plastic straps, steel straps and paper labels are used as transport packaging, which can be sorted and collected for recycling. PE films are also used for sea transport with bulk carriers or so-called Mafi trailers. Transport packaging made of paper, cardboard, PET strapping, steel strapping and PE film can be recycled if collected separately. Cover boards can be reused. Retrieval of the packaging material can be arranged with the manufacturer in individual cases.

2.10 Condition of use

The usage condition of EGGER OSB material components correspond to section 2.5 'Base materials'. The bonding agents are chemically stable and mechanically bonded to the wood under normal conditions..

2.11 Environment and health during use

Environmental protection:
There is no risk of water, air or ground contamination given currently available knowledge assuming intended use is observed.
Health aspects:
There are no known health hazards or effects to be expected from normal use, i.e. in accordance with the intended uses of EGGER OSB. All board types can release small quantities of natural, volatile organic substances typical of wood. Emissions of harmful substances are not detectable, with the exception of small, harmless quantities of formaldehyde in board types manufactured with glue containing formaldehyde in accordance with section 2.5.

2.12 Reference service life

The service life of OSB boards depends on the area of application in the specific building/construction project in use classes 1 and 2 in accordance with *EN 1995-1-1*. If used correctly, taking into account the applicable technical rules for wood protection such as e.g. *DIN 68800-2* and with regular maintenance, the service life is 50 years or longer, according to the *BBSR table* dated 24 February 2017. Durability in the utilisation state is defined by the use classes (see chapter 2.2).

2.13 Extraordinary effects

Fire
Reaction to fire:
The Fire resistance reaction to fire according to *EN 13986*, Table 8 (CWFT) with board thickness ≥ 9 mm and raw density ≥600 kg/m³ corresponds to building material class D-s2, d0.
With raw density
≥580 kg/m³ and board thickness ≥ 12 mm, the fire resistance corresponds to class Ds1, d0 according to the classification report in accordance with *EN 13501-1*. Other OSB boards correspond to building material class E.

Smoke development / smoke density:
The smoke development according to *EN 13986*, Table 8 (CWFT) with board thickness ≥ 9 mm and raw density ≥600 kg/m³ corresponds to class s2.
Toxicity of fire gases:
When checked by the EPA Aachen, the emissions were in the range of solid wood (cf. 7.4 Toxicity of fire gases). Sulphur dioxide and hydrogen cyanide may be released when burning OSB boards under certain fire conditions, in addition to the usual fire gasses such as carbon monoxide and dioxide.
Change of the aggregate state:
Dripping by combustion does not occur because EGGER OSB boards do not liquefy when hot.

Water
As a rule, EGGER OSB boards do not contain any substances that pose a risk to water due to leaching. An exception are OSB boards of type H2, which are treated with a biocide as a termiticide. The EGGER SDS with the coding SDS-OSBH2-EN, version 01, provides safety instructions.
OSB boards are not resistant against continuous water exposure, however, localised damaged parts can be easily replaced. A significant change in material moisture leads to dimensional changes in length, width and thickness, which can affect the serviceability of the structure, see *CEN/TR 12872*.

Mechanical destruction
Breaking behaviour:
The breaking pattern of EGGER OSB displays a relatively brittle behaviour when exposed to high forces, and small smooth breaking surfaces occur on the broken edges of the boards. There is no negative impact on the environment.

2.14 Re-use phase
Reuse: When renovating or discontinuing the utilisation phase of a building, OSB boards can be collected separately during demolition, and be reused for construction. As a rule, exceptions to this are OSB boards that are untreated and have been bonded full surface.
Material utilisation: Untreated OSB boards can be used as recycling material for the production of chipboards when collected by type.
Energy utilisation: If neither reuse nor material recycling is possible, energy recovery can be pursued. This is recommended, given the high calorific value of OSB boards of approx. 17 MJ/kg. OSB may only be incinerated in suitable and authorised plants. Local determinations are available from the relevant authorities.

2.15 Disposal
Waste code: 03 01 05 / 17 02 01 according to European Waste Catalogue *EU/2014/955 (EAK)*. In the interests of cascading use and avoiding CO_2 emissions, the OSB boards should be reused or recycled before being used to generate energy.

2.16 Further information
Extensive information and processing recommendations are available under www.egger.com/bauprodukte.

3. LCA: Calculation rules

3.1 Declared Unit
This environmental product declaration is based on a declared unit of 1 m³ EGGER OSB boards with an average raw density of 611 kg/m³ and a delivery moisture of approximately 6%.

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	m^3
Gross density	611	kg/m^3

EGGER OSB boards are manufactured in the plants of Wismar (DE) and Radauti (RO).

The calculation of the declared raw density and summarisation was volume-weighted.
In addition to the raw density, the products analysed differ in part with regard to the glue system used. In Wismar, the OSB boards are glued with isocyanate glue systems, whereas Radauti uses MUF glue systems in addition to isocyanate glue systems.

Due to the balanced production proportions of the two plants, the declared unit reflects a representative average.

3.2 System boundary
The LCA of the EGGER OSB boards includes a cradle-to-gate consideration of the occurring environmental impact with the modules C1-C4 and module D (A1-A3, +C, +D). The following life cycle phases are taken into account in the analysis:

Module A1– A3 | Production stage
The product stage includes the cost of raw material procurement (roundwood, producing the glue system, additives, etc.), as well as related transport relative to the production plants in Wismar and Radauti. Within the plant premises, the lumberyard, the strand preparation, OSB production, board finishing are considered to the plant or to shipping. The preparation of thermal and electric energy takes place in the case of both plants via their own biomass power plant; in addition, electricity is purchased from the grid.

Module C1 | Dismantling / Demolition
The products are dismantled manually or with little use of machinery. It can therefore be assumed that the energy required to dismantle the products is a negligible factor, which means that no environmental impact from the dismantling of the products is declared in Module C1.

Module C2 | Transport to waste treatment
Module C2 includes transport to waste treatment. For this purpose, transport by lorry over a distance of 50 km is used as a scenario.

Module C3 | Waste processing
Module C3 declares the biogenic carbon dioxide emissions in energetic utilisation at the end of the product life. Furthermore, chopping after product disassembly is also considered. The wood products and with them the material-inherent properties leave the product system as secondary fuel in module C3.

Module C4 | Disposal
The scenario used declares the energy recovery of the wood-based materials, which means that no environmental impact from the waste treatment of the products in C4 are to be expected.

Module D | Uses and charges beyond the limits of the product system
The energy utilisation of the product at the end of its life cycle is described in Module D, including energetic substitution potentials as a European average scenario.

3.3 Estimates and assumptions

Assumptions and estimates are used in the absence of a representative background data set to represent the environmental impact of certain raw materials. All assumptions are supported with detailed documentation and correspond to the best possible representation of reality given the available data. A generic data set from the *MLC Database* for spruce roundwood was used as background data set for roundwood. A large part of the wood processed by EGGER represents coniferous fibrewood. For other wood types used, the data set for spruce roundwood should be considered as an approximation. In the case of missing measurement data for emissions from the presses, these values were estimated based on the publication by *Rüter & Diederichs 2012*.

3.4 Cut-off criteria

All inputs and outputs for which data are available and from which a significant contribution can be expected are included in the LCA model. Missing data are populated when a data basis is available using conservative assumptions for average data or generic data and are documented accordingly. Only data with a contribution of less than 1% were removed. Neglecting these data can be justified by the limited effect to be expected. Thus, no processes, materials or emissions were neglected that are expected to make a significant contribution to the environmental impact of the products under consideration. It can be assumed that the data were recorded in full and that the total sum of the neglected input flows does not exceed 5 % of the energy and mass input.
Expenses for machinery and infrastructure were not taken into account.

3.5 Background data

The *MLC* 2023.2 background database in *LCA FE* software version 10 was used to calculate the LCA. In addition, secondary data from recognised literature sources (e.g. *Rüter & Diederichs 2012*) was used.

3.6 Data quality

The data was collected via spreadsheets specifically created by EGGER. Questions were answered through an iterative process in writing via email, phone, or in persona/web meetings. Given the intense discussion concerning a representation of material and energy flows in the company that is as close as possible to reality, led by EGGER and Daxner & Merl, the high quality of collected foreground data can be assumed. A consistent and uniform calculating procedure was applied in line with *ISO 14044*.

When selecting the background data, the technological, geographical, and time-related representativeness of the data basis was taken into consideration. When specific data was missing, generic data sets or a representative average were used. The background data sets are not older than ten years.

The assessment of the representativeness of the average can be found in section 3.1.

3.7 Period under review

As part of the collection of foreground data, the life cycle inventory was collected for the production year May 2022-April 2023 (financial year 2023). The data are based on the annual volumes used and produced.

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: EU-27 Member States

3.9 Allocation

The carbon dioxide content and primary energy content of the products have been balanced on the basis of their inherent material characteristics in line with underlying physical relationships.

In addition to the wood waste utilised internally, the plant in Radauti also obtains fresh wood, which is used to generate energy in the plant's own power plant. A price allocation according to *Rüter & Diederichs 2012* was used to calculate the environmental impact of by-products from the sawing system.

In addition to OSB products, the Wismar plant also produces MDF/HDF, laminate flooring, glue and impregnating resin. The delineation of material and energy flows between the products is based on analyses from EGGER's controlling system.

In addition to the declared products, the production of OSB products in Wismar also generates wooden by-products such as bark and strands. Sold by-products are treated in line with the recommendations of the *EN 16485* as by-products and allocated on the basis of currently applicable market prices. The wood residues are not sold in Radauti.

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* 2023.2 background database in *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.

Information describing the biogenic carbon content at the plant gate

Name	Value	Unit
Biogenic carbon content in product	270.6	kg C
Biogenic carbon content in accompanying packaging	2.6	kg C

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

Integration into building (A5)

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

Name	Value	Unit
Packaging (polyethylene)	0,01	kg
Packaging (polyethylene terephthalate)	0,17	kg
Packaging (wood-based material)	5,74	kg
Packaging (steel)	0,09	kg
Packaging (paper)	0,45	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	611	kg

Reuse, recuperation and recycling potential (D), relevant scenarios

Name	Value	Unit
Processing rate	100	%
Efficiency of the system	68	%

The product reaches the end of the waste status after it is removed from the building, transported for preparation, and the chopping of the product. For the end of life of OSB boards, energy recovery as secondary fuel is assumed. Energetic utilisation takes place in a biomass power plant. System-specific figures correspond to a European average scenario, given that the main sales market of EGGER products is focussed on Europe. The scenario foresees a processing rate of the wood-based materials after removal from the building of 100%. This assumption must be adapted accordingly after using the results in the context of the building. At the end of the product's life, a comparable equilibrium moisture content to the delivery moisture content is assumed. This value may fluctuate significantly depending on the storage of the product prior to energetic utilisation.

5. LCA: Results

The following table contains the life cycle assessment results for a declared unit of 1 m³ of average EGGER OSB boards (611 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 EGGER OSB-Platte (611 kg/m³)

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 eq	-8.05E+02	0	2.4E+00	9.96E+02	0	-4.75E+02
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	1.72E+02	0	2.38E+00	4.18E+00	0	-4.73E+02
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	-9.78E+02	0	6.34E-03	9.92E+02	0	-2.43E+00
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	3.03E-01	0	2.19E-02	4.55E-04	0	-3.35E-02
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	5.85E-10	0	3.07E-13	7.71E-11	0	-4.46E-09
Acidification potential of land and water (AP)	mol H^+ eq	8E-01	0	8.37E-03	8.93E-03	0	4.67E-01
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	7.64E-04	0	8.63E-06	1.56E-05	0	-9.13E-04
Eutrophication potential aquatic marine (EP-marine)	kg N eq	3.55E-01	0	3.84E-03	2.14E-03	0	9.26E-02
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	3.8E+00	0	4.31E-02	2.23E-02	0	1.1E+00
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	1.03E+00	0	7.57E-03	5.7E-03	0	3.92E-01
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	1.75E-05	0	1.56E-07	6.47E-07	0	-3.96E-05
Abiotic depletion potential for fossil resources (ADPF)	MJ	3.97E+03	0	3.22E+01	8.81E+01	0	-8.92E+03
Water use (WDP)	m^3 world eq deprived	4.96E+00	0	2.85E-02	9.32E-01	0	-2.23E+01

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m³ EGGER OSB-Platte (611 kg/m³)

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	2.44E+04	0	2.34E+00	1.01E+04	0	-3.04E+03
Renewable primary energy resources as material utilization (PERM)	MJ	1.01E+04	0	0	-1E+04	0	0
Total use of renewable primary energy resources (PERT)	MJ	3.45E+04	0	2.34E+00	5.26E+01	0	-3.04E+03
Non renewable primary energy as energy carrier (PENRE)	MJ	3.58E+03	0	3.23E+01	4.75E+02	0	-8.92E+03
Non renewable primary energy as material utilization (PENRM)	MJ	3.96E+02	0	0	-3.87E+02	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	3.97E+03	0	3.23E+01	8.81E+01	0	-8.92E+03
Use of secondary material (SM)	kg	0	0	0	0	0	0
Use of renewable secondary fuels (RSF)	MJ	4.95E+01	0	0	0	0	1E+04
Use of non renewable secondary fuels (NRSF)	MJ	0	0	0	0	0	3.87E+02
Use of net fresh water (FW)	m^3	7.69E-01	0	2.56E-03	4.25E-02	0	-1.72E+00

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m³ EGGER OSB-Platte (611 kg/m³)

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	5.26E-04	0	9.99E-11	6E-07	0	-2.82E-07
Non hazardous waste disposed (NHWD)	kg	1.52E+01	0	4.92E-03	6.45E-02	0	1.47E-01
Radioactive waste disposed (RWD)	kg	4.31E-02	0	6.04E-05	1.4E-02	0	-8.08E-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	6.48E+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 EGGER OSB-Platte (611 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 categorised as high.

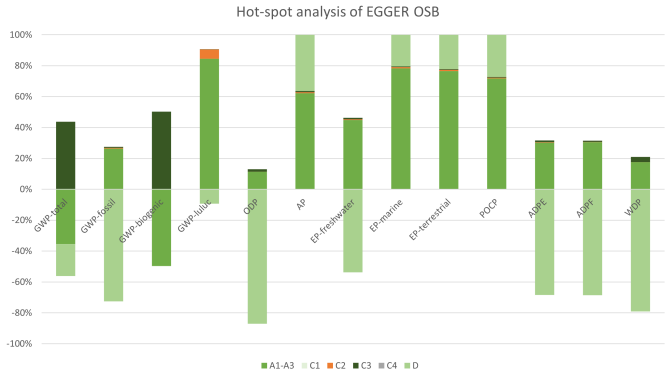
Limitation note 1 - applies to the indicators: 'Potential for depletion of abiotic resources non-fossil resources', 'Potential for depletion of abiotic resources fossil fuels', 'Water depletion potential (user)'.
The results of this environmental impact indicator need to be used with caution as the uncertainties in these results are high or as there is limited experience with the indicator.

6. LCA: Interpretation

The following interpretation includes a summary of the LCA results relative to a declared unit of 1 m³ average EGGER OSB boards.

For the global warming potential (GWP) during the production phase (**Module A1– A3**) of OSB products, the total is a negative value. This is due to the material use of wood in the products.
While the tree is growing, the wood stores carbon dioxide as biogenic carbon (negative greenhouse potential) and does therefore not have a greenhouse effect as long as it is stored in the product. Only once the product is utilised energetically at the end of its life (**Module C3**), the stored carbon is released into the atmosphere as carbon dioxide emissions and contributes to the global warming potential.
The energy utilisation of scrap wood was modelled CO_2neutral.

The negative values in **Module D** can be explained through the fact that the energy generated by the energy utilisation of the product is able to replace the combustion of fossil fuels. In this way, more emissions of (mainly fossil) fuels are avoided than those emitted through the use of the energy stored in the wood. The environmental impact (AP, EP, POCP) in Module D is due mainly to emissions from the combustion of the biomass.



The potential global warming (GWP) caused by the production phase (modules A1-A3) of OSB boards can be largely attributed to the production costs of the chemicals used in production, primarily the glue system. In addition to the gluing system, the greenhouse gas emissions from the forestry processes for the provision of roundwood and the provision of energy for production also represent a potential impact factor.

The potential range of the average lies within a corridor of ±1 % relative to the fossil greenhouse gas emissions. For other indicators, there are deviations in a corridor of up to ±20 % (outliers: ±25 % for water use, ±35 % for freshwater eutrophication potential, ±50 % for GWP-biogenic).
The results of the previous EPD (EPD-EGG -20180107-IBD2-DE) are not directly comparable with the present, updated version due to the update of the underlying methodology in accordance with EN 15804+A2.

7. Requisite evidence

The following tests are performed for EGGER OSB as part of the on-going external supervision or on request.

7.1 Formaldehyde

Background information: EGGER OSB boards fulfil the requirements of *EN 13986*:2004+A1:2015 emission class E1 and the German Chemicals Prohibition Ordinance *ChemVerbotsV* as well as emission class F****, whose limit value is defined as 0.3mg/L according to the desiccator method JAS standard.
Measurement centre: EPH GmbH, Dresden, Germany

Test reports:
2118075/E1/2020/OSB-9/2023/01
2118075/E1/2020/OSB-10/2023
2118074/QDF/OSB3/2023
2118075/QDF/OSB3/2023/01
2118074/QDF/OSB4/2023
Measurement centre: PFS TECO, Cottage Grove, Wisconsin, USA
Test reports:
22-756 (2022, Table 11)
23-765 (2023, Table 11)

Results: The emission values determined for EGGER OSB boards (chamber method according to *EN 717-1*) are <0.03 ppm for formaldehyde-free glued OSB boards, the emission values for MUF-glued E1 boards are <0.1 ppm. The measured values for OSB 3 JAS TOP are < 0.3 mg/L (F****) (desiccator method according to *JAS standard*)

7.2 MDI
Measurement centre: EPH GmbH, Dresden, Germany Test reports:
2520047/2 (2020)
2523618/2 (2024)
2523618/1 (2024)
Results: The test was carried out in accordance with the RAL UZ 76 award guidelines. The monomeric isocyanate 4,4 MDI could not be detected.

7.3 Testing for pre-treatment of the applied materials
7.3.1 Heavy metals
Measurement centre: EPH GmbH, Dresden, Germany
Test reports:
2118074/QDF/OSB3/2023
21180785/QDF/OSB3/2023/1
2118074/QDF/OSB4/2023
Results: The analysis was carried out for the heavy metals arsenic, copper, chromium, cadmium, mercury and lead. OSB boards fulfil the requirements of the Waste Wood Ordinance (*AltHolzV*) and the increased requirements of the *QDF directive*.

7.3.2 PCP and lindane
Measurement centre: EPH GmbH, Dresden, Germany Test reports:
2118074/QDF/OSB3/2023
21180785/QDF/OSB3/2023/01
2118074/QDF/OSB4/2023
Results: The pesticides PCP and lindane were not detectable in any sample (BG < 0.05 mg/kg).

7.4 Toxicity of fire gases
Measurement centre: EPA Aachen, Germany
Test report:
PB 0011/2023 - (Wismar)
PB 0010/2023 - (Radauti)
Results: The OSB samples were analysed according to *DIN 53436* or *DIN 41021* (at 400°C).
The gaseous emissions released correspond largely to the emissions released by wood under the same conditions.

7.5 VOC-emissions
Measurement centre: EPH GmbH, Dresden, Germany
Test reports: Loading 1.0 m²/m³
2117289/2020/8
2117289/2020/9
2118075/2022/3
2519550/1 (2019)
2519550/2 (2019)

AgBB-result overview (28 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16)	139 - 414	µg/m^3
Sum SVOC (C16 - C22)	-	µg/m^3
R (dimensionless)	0.691 - 0.799	-
VOC without NIK	0 - 32	µg/m^3
Carcinogenic Substances	-	µg/m^3

8. References

Standards

AS/NZS 1604
AS/NZS 1604.2:2021, Specification for preservative treatment - Part 2: Reconstituted wood--based products.

CEN/TR 12872
CEN/TR 12872:2014, Wood-based materials guideline for the use of load-bearing boards in floors, walls and roofs.

DIN 4102-1
DIN 4102-1:1998, Fire behaviour of building materials and elements- Part 1: Building materials; terminology, requirements and test methods.

DIN 53436
DIN 53436:2015; Generation of thermal decomposition products from materials for their analytic-toxicological testing - Decomposition apparatus and determination of test temperature.

DIN 68800-2
DIN 68800:2022, Wood preservation - Part 2: Preventive constructional measures in buildings.

EN ISO 12572
EN ISO 12572:2016, Thermal and moisture insulation performance of building materials and products - Test method - Determination of water vapour permeability - Method using a test vessel (ISO 12572:2016).

EN 300
EN 300:2006, Oriented strand board (OSB) Definitions, classification and specifications.

EN 323
EN 323:1993, Wood-based panels - Determination of density.

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

EN 789
EN 789:2004, Timber structures. Test methods. Determination of mechanical properties of wood-based panels.

EN 1995-1-1
EN 1995-1-1:2010, Eurocode 5: Design of timber structures - Part 1- 1: General - Common rules and rules for buildings.

EN 13986
EN 13986:2004+A1:2015, Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking.

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

ISO 9001

ISO 9001:2015: 11, Quality management systems — Requirements.

ISO 14001
ISO 14001:2015-11, Environmental management systems — Requirements with guidance for use.

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

ISO 14044
DIN EN ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines.

JAS standard
Japanese Agricultural Standard (JAS) for Structural Panels; MAFF No. 664:2019.

PS 2-18
NIST PS 2-18, Voluntary Product Standard PS 2-18, Performance Standard for Wood Structural Panels; March 2019.

QDF-directive
QDF directive 'Wood-based materials'. Qualitätsgemeinschaft Deutscher Fertigbau e.V.

RAL-UZ 76
Testing guidelines of RAL ecolabel - RAL-UZ 76 (wood-based materials) "Determination of the MDI emission according to BIA 7680 - Test chamber method"

Additional bibliography
Biocidal Products Regulation (EU) No. 528/2012
Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products.

CPR Regulation (EU) No 305/2011
CPR Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC.

EUTR VO (EU) 995/2010
Regulation (EU) No. 995/2010 of the European Parliament and of the Council of 20 October 2010 laying down the obligations of operators who place timber and timber products on the market; text with EEA relevance.

EUTR VO (EU) 2023/1115
Regulation (EU) 2023/1115 of the European Parliament and of the Council of 31 May 2023 on the making available on the Union market and the export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No 995/2010 (Text with EEA relevance).

ECHA list/candidate list
published in accordance with Article 59(10) of REACH Regulation (EC) No. 1907/2006 of the European Parliament and the Council for Registration, Assessment, Approval and Restriction of chemical substances (REACH)

BBSR Table
BBSR Table 'Useful lives of components for life cycle analyses according to the BNB rating system' of 24.02.2017.

AltholzV
Waste wood ordinance: Regulation laying out the requirements for the recovery and disposal of waste wood; version 06- 2020.

EU/2014/955 (EWC)
Regulation on the European Waste Catalogue EU/2014/955.

IBU 2021
Institut Bauen und Umwelt e.V.: General EPD Programme Guidance of the Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021 http://www.ibu epd.com

LCA FE
LCA FE 10, LCA for Experts Software System and Database for Life Cycle Engineering. Version 10.7.1.28. Sphera, 19922023.

MLC
MLC 2023.2, Database for Life Cycle Engineering implemented in LCA for Experts software system. DB v10.7 2023.2. Sphera, 1992-2023. Available at: https://lcadatabase.sphera.com/

PCR Part A
Product category rules for building-related products and services. PART A: Calculation rules for the ecological balancing and requirements towards the project report according to EN 15804+A2:2019. Version 1.3. Berlin: Institut Bauen und Umwelt (Institute for Construction and Environment) e.V. (eds.), 2022.

PCR Part B
Product category rules for building-related products and services. PART B: Requirements of the EPD for wood-based materials. Version 10, Berlin: Institut Bauen und Umwelt e.V., 30.04.2024.

Rüter & Diederichs, 2012
Rüter, S.; Diederichs, p.: Ökobilanz--Basisdaten für Bauprodukte aus Holz. Working report from the Institute of Wood Technology and Wood Biology No. 2012/1. Hamburg: Johann Heinrich von Thünen-Institut.

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