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-20200253-IBC3-EN
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Valid to	16/05/2028

PerfectSense Lacquered Chipboards

Fritz EGGER GmbH & Co. OG

Institut Bauen und Umwelt e.V.

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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-20200253-IBC3-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

28/08/2023

Valid to

16/05/2028

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

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

PerfectSense Lacquered Chipboards

Owner of the declaration

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

Declared product / declared unit

1 m² EGGER PerfectSense Lacquered Chipboard (12 kg/m²).

Scope:

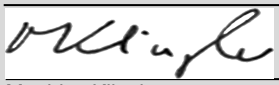
This document refers to EGGER PerfectSense Lacquered Chipboard, produced in Brilon, Germany.

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



Matthias Klingler,
(Independent verifier)

2. Product

2.1 Product description/Product definition

PerfectSense Lacquered Boards are board-shaped materials according to *EN 312:2010-09, Particleboard - Specification*, which are classified for general purposes in dry conditions.

For the preliminary product, the chip coreboard is provided, according to the
EN 14322:2017-03, Wood-based panels - Melamine faced boards for interior uses - Definition, requirements and classification with a melamine resin coat.

A special manufacturing process makes it possible to combine a matt surface lacquer finish with flat or deeper texture on a chip coreboard. The lacquer finish gives PerfectSense Lacquered Chipboard a velvety matt look and feel with anti-fingerprint properties. PerfectSense Lacquered Boards are provided with a one-sided UV lacquer finish as standard*.
To protect the lacquered surface, the PerfectSense Lacquered Board is provided with a protective film, which is peeled off the surface after final processing.

*The optionally available double-sided lacquer finish is excluded from the validity of this EPD.

For placing the product on the market in the EU/EFTA (with the exception of Switzerland), Regulation (EU) No. 305/2011(CPR) applies. The product requires a declaration of performance taking into account *EN 13986+A1:2015-04 Wood-based panels for use in construction – Characteristics, evaluation of conformity and marking* and the CE marking. Relevant national regulations apply to use.

2.2 Application

PerfectSense Lacquered Chipboard is used in a wide range of furniture and interior applications, for example, as a front, sliding door or body material.

2.3 Technical Data

The PerfectSense Lacquered Board has a melamine resin-coated chipboard as coreboard. The definition, requirement and classification of melamine faced boards for interior use and dimensional tolerances are provided by the *EN 14323* standard.

The surface properties of the lacquered board are regulated by a number of other standards, e.g. the behaviour under scratching stress according to *EN 438-2* or surface defects according to AMK leaflet *AMK-MB-009*.

For detailed information, please refer to the technical data sheets available at www.egger.com.

Structural egineering data

The following data are based on the EGGER raw chipboards Eurospan E1E05 TSCA P2 and Eurospan JP F0,3 F**** MR board type according to *EN 312:2010* and therefore refer to the uncoated coreboard of the PerfectSense Lacquered Board.

Name	Value	Unit
Gross density according to EN 323	655	kg/m^3
Grammage Eurodekor with 17,6 mm	11.6	kg/m^2
Bending strength (longitudinal) according to EN 310	7 - 20	N/mm^2
E-module (longitudinal) according to EN 310	1200 - 3150	N/mm^2
Material dampness at delivery EN 322	4 - 13	%
Thermal conductivity EN 13986	0.1 - 0.14	W/(mK)
Water vapour diffusion resistance factor EN 12524 in µ-dry	50	-
Sound absorption coefficient EN 13986 Tab. 10 250 Hz bis 500 Hz	0.1	%
Formaldehyde emissions vary by product	E1E05)*1, TSCA)*2, F****)*3	µg/m^3
Thickness tolerance sanded board according to EN 324	+-0,3	mm
Length and width tolerance according to EN 324	+-5,0	mm
Edge straightness tolerance according to EN 324	+-1,5	mm
Perpendicularity tolerance according to EN 324	+-2,0	mm

*1) E1E05: According to the ChemVerbotsV, coated and uncoated wood-based materials may not be placed on the market in DE if the compensation concentration of formaldehyde caused by the wood-based material in the air of a test room according to EN 16516 exceeds 0.1 ml/cbm (ppm).
*2) TSCA: According to the US Toxic Substances Control Act (TSCA Title VI), chipboard may not exceed 0.09 ppm according to test chamber method ASTM E 1333.
*3) F****: According to Japanese standard JIS A 5908, the uncoated chipboard complies with the limit (mean) of ≤ 0.3 mg HCHO/L according to desiccator method JIS A 1460.

Performance values of the product as stated in the declaration of performance in relation to its essential characteristics according to *EN 13986+A1:2015-04, Wood-based panels for use in construction – Characteristics, evaluation of conformity and marking* (not part of the CE marking).

2.4 Delivery status

Standard format [mm]: 2.800 × 2.070
Thicknessrange [mm]: 8/28

2.5 Base materials/Ancillary materials

Pre-products

Raw chipboards between 8 and 28 mm thick with an average density of 655 kg/m³ consisting of (information in weight % per 1 m³ of production):
- approx. 84-86 % wood weight: Fresh wood from thinning measures and sawmill residues, mainly spruce and pine, are used for the production of chipboard. Up to 30 % of the raw material is covered by recycled wood, which is materially utilised.
- approx. 4-7 % water
- approx. 8-10 % UF glue: consisting of urea-formaldehyde resin. Through polycondensation, the aminoplastic adhesive hardens completely in the pressing process.
- < 1 % PMDI glue (polymer diphenylmethane diisocyanate): MDI (diphenylmethane - diisocyanate), a polycarbamide pre-

product, is used, which is converted into PUR (polyurethane) and polyurea during board production. These serve the purpose of bonding the wood fibres.
- <1 % paraffin wax emulsion: A paraffin wax emulsion is added to the recipe during application as a water repellent (improves moisture resistance).

For the coating:
- Decorative papers: with a grammage of 60 - 120 g/m²
- Melamine formaldehyde resin: amino-plastic resin for the impregnation of decorative paper for lamination; the resin hardens inside the press into a hard and wear-resistant surface.

For the lacquer finish:
- UV-curing acrylic varnish: 94.5-97.5% acrylic preparation; 2.5-5.5% photo-initiators for UV-curing. The paint polymerises completely under UV radiation to a hard surface.

The product contains substances on the *ECHA List* of substances of very high concern (16.01.2020) above 0.1% by weight: no.

The 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.

Biocidal products have been added to this building product or it has been treated with biocidal products (this refers to treated goods within the meaning of the Biocidal Products Regulation (EU) No. 528/2012): no.

2.6 Manufacture

The base material of PerfectSense Lacquered Chipboard is melamine-resin-coated chipboard (EGGER Eurodekor chipboard coated).

Production of the raw boards (EGGER Eurospan):
1. Wood preparation
- Roundwood cutting
-- Wood chip preparation
-- Waste wood treatment
2. Drying the chips to approximately 2 – 3 % residual moisture
3. Sorting the chips
4. Applying glue to the chips
5. Spreading the glue-coated chips onto a forming machine
6. Pressing the chip cake in a continuously operating hot press (ContiRoll)
7. Formatting of the raw boards
8. Cooling the raw boards in star coolers
9. Sanding the upper and lower sides
10. Stacking into large stacks.
All scraps generated during production (trimming, cutting and milling scraps) are fed back into the production process.

Production of impregnates for coating:
1. Processing the base paper
2. Addition of saturating resins (MUF) in the plant
3. Drying the impregnated paper in heated dryers
4. Formatting the endless paper by means of a cross-cutter
5. Stacking the formatted sheets on pallets

Coating the chipboard (EGGER Eurodekor):
1. Laying the impregnated papers onto the upper and lower sides of the raw board
2. Pressing the board in the hot press with variously textured pressing sheets
3. Grading by quality and stacking
4. Acclimatisation phase of up to 14 days
All waste generated in the course of the coating is used thermally within the plant.

Lacquer finish of the coated chipboard:
1. Lacquering with adhesive primer, curing by means of UV rays
2. Lacquering with top coat as final surface, curing by means of UV rays
3. Application of protective film
4. Sorting by quality and stacking

A quality management system in accordance with *ISO 9001* requirements is implemented and certified at the production site.

2.7 Environment and health during manufacturing

Environmental management begins at EGGER with state-of-the-art technologies: The plants are equipped with state-of-the-art wastewater, noise protection and air purification systems.
The EGGER environmental management system runs through the entire company, enabling efficient implementation of environmental objectives and the integration of environmental aspects into work processes. The objective is to ensure compliance with legislation, to avoid or reduce negative operational environmental impact, and to continuously improve environmental performance.
The production plant is certified with an energy management system according to *ISO 50001* and an environmental management system according to *ISO 14001*.

2.8 Product processing/Installation

EGGER PerfectSense Lacquered Boards can be sawed and drilled with regular (electrical) wood processing machines. Hard metal tipped tools are recommended, particularly in the case of circular saws. Wear a respiratory mask if using hand tools without a dust extraction device. Detailed information and processing recommendations are available at: www.egger.com

2.9 Packaging

Wooden chipboard and corrugated cardboard are used for covering, as well as PET packaging straps.
The lacquered surface of the board is also provided with a protective film. This is laminated onto the board immediately after lacquering to protect the surface during further processing.

2.10 Condition of use

The component materials of coated chipboard comply in terms of their proportions to those of the basic material composition described in section
2.6 Basic materials.
During compression, the aminoplast resin (UF) is cross-linked three-dimensionally by an irreversible polycondensation reaction under the application of heat.
The bonding agents as well as the paint used are chemically stable and permanently bonded to the wood.

2.11 Environment and health during use

Environmental protection: According to the present state of knowledge, hazards to water, air and soil cannot arise if the products described are used as intended.

Health aspects: According to the current state of knowledge, no health hazards or adverse effects are to be expected from normal use in accordance with the intended purpose of PerfectSense Lacquered Boards. Natural wood constituents may be released in small quantities. With the exception of minor amounts of formaldehyde in quantities that are harmless to health, no emissions of hazardous substances can be detected.

2.12 Reference service life

The service life of PerfectSense Lacquered Boards depends on the area of application in the specific project, taking into account the use class according to *EN 1995-1-1*, *DIN 68800-2* and appropriate maintenance.

For general fixtures/furniture systems, the *BBSR table* "Service life of building components for life cycle analysis according to BNB" gives a range of 10-40 years (KG 371-378). These useful lives are based on empirical values and are used to develop forecast scenarios for further LCAs. No binding statements (warranties, construction contracts, expert opinions, etc.) can be derived from the data.
The temperature, humidity, UV radiation, frequency and extent of room climate changes as well as the presence of standing water have a significant influence on the ageing of the product.

2.13 Extraordinary effects

Fire

The PerfectSense Lacquered Board complies with fire class D according to *EN 13501-1* and falls into categories s2 (normal smoke development) and d0 (non-dripping). PerfectSense Lacquered Boards do not become liquid when heated. Burning dripping is not possible.

The PerfectSense Lacquered Board meets the material properties and end-use conditions according to *EN 13986* and is classified without the need for retesting (CWFT).

Fire protection

Name	Value
Building material class	D (normal flammability)
Burning droplets	d0 (non-dripping)
Smoke gas development	s2 (normal smoke)

Water

No water-polluting substances are washed out. Chipboard is not resistant to the long-term effects of water (change to the mechanical properties from swelling of the fibres), yet damaged areas can be replaced at a local level.

Mechanical destruction

The fracture pattern of a chipboard shows a relatively brittle behaviour, whereby sharp edges can occur at the fracture edges of the boards (risk of injury).

2.14 Re-use phase

Re-use / Recycling: EGGER PerfectSense Lacquered Boards can easily be collected separately in the case of selective dismantling when a building is converted or ends its use phase, and can be re-used or recycled for purposes other than its original application. Exceptions to this are boards that have not been bonded over their surface.
Reclamation for energy generation (in approved facilities): With the high average calorific value of approximately 18.5 MJ/kg an energy utilisation for the generation of process energy and electricity (combined heat and energy power plants) from residues from the construction site as well as from demolition measures are to be preferred over dumping.

2.15 Disposal

Construction site waste of EGGER PerfectSense, and waste from demolition projects, should primarily be used in materials. If this is not possible, they must be sent for energy recovery instead of landfilling (waste code according to the European Waste Catalogue *EWC: 170201/030105*).
The transport packaging materials, chipboard and PET packaging straps as well as protective film can be recycled as long as they are collected separately. In some cases, external disposal can be arranged with the manufacturer.

2.16 Further information

Detailed information and recommendations are available at www.egger.com.

3. LCA: Calculation rules

3.1 Declared Unit

This environmental product declaration refers to a declared unit of one square meter of EGGER PerfectSense Lacquered Chipboard produced with an average surface weight of 12 kg/m².

Specification of the declared unit

Name	Value	Unit
Declared unit	1	m²
Grammage	12	kg/m^2

EGGER PerfectSense Lacquered Chipboard is made at the Brilon (DE) plant. The surface weight of the PerfectSense Lacquered Chipboard was calculated surface-weighted. The calculations of the EURODEKOR products are again based on the averaging of the chipboard, which is volume-weighted. The glue mix of the products was also included in the calculation as a weighted average.

The data for the PerfectSense Lacquered Boards lacquer system was collected for the period from September 2021 to February 2022, because this is a new product from EGGER. The period before September 2021 was used to prepare for the modification of the systems and test phase. The period from September 2021 was chosen because it can be assumed that representative production conditions were in place from this point on.

3.2 System boundary

The LCA of the EGGER PerfectSense Lacquered Chipboard 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 production stage includes the expenses for the supply of raw materials (roundwood, production of the basic chemicals used for the gluing systems of the wood-based materials, the impregnation components such as decorative and kraft paper, production of the paint, auxiliary materials, etc.) and the associated transport to the production site in Brilon. Within the plant boundaries, the log yard, wet chip preparation, drying, gluing, spreading, pressing, the sanding line up to the warehouse and shipping are taken into account. The EURODEKOR products are also finished by applying an impregnation in the short-cycle presses and then packaged. In the case of PerfectSense Lacquered Chipboard, the EURODEKOR products are additionally coated with a paint layer. The glue system used is not manufactured on site. Thermal and electrical energy, compressed air and water are provided by central suppliers at the Brilon site. The majority of the electrical energy used is obtained from the German power grid. Both internal wood waste and scrap wood sourced

externally are used in the in-house biomass power plant. The system boundary for the scrap wood used in the production is set after sorting and chopping. It is assumed that the end of the waste status has been reached. The system boundary for secondary raw materials according to *EN 15804* applies.

Module C1 | Dismantling / Demolition
Manual dismantling was assumed for the PerfectSense Lacquered Board. The associated efforts are negligible, which means that no environmental impact from the dismantling of the products is declared.

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 representative scenario.

Module C3 | Waste processing
Chopping after product disassembly is considered in module C3. 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 products, 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 *GaBi* 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
Secondary data are included to represent the background system in the LCA model. These are taken, on the one hand, from the *GaBi*-10 database and, on the other hand, from recognised literature sources, such as *Rüter & Diederichs 2012*.

3.6 Data quality
The data was collected via spreadsheets specifically created by EGGER. Questions were answered through an iterative process in writing via e-mail, phone, or in person/in 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 *GaBi* background data sets are not older than ten years.

3.7 Period under review
As part of the collection of the foreground data, the life cycle was recorded for the production year 2018. The data are based on the annual volumes used and produced. In addition, data for the PerfectSense Lacquered Chipboard lacquering line were collected for the period September 2021 to February 2022.

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: Germany

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. Allocation within the forestry chain is based on the publication of *Hasch 2002* and its update by *Rüter & Albrecht 2007*.
For board production, sawing by-products were also used in addition to roundwood. A price allocation according to *Rüter & Diederichs 2012* and according to the primary data for the sawmill in Brilon was used to calculate the environmental impact of these by-products from the sawing system. The thermal and electrical energy generated in the combined heat and power systems is allocated according to exergy.

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 *GaBi*-2022.2 background database in *GaBi* software version 10 was used to calculate the LCA.

4. LCA: Scenarios and additional technical information

Characteristic product properties biogenic carbon
The biogenic carbon content quantifies the amount of biogenic carbon in the declared building product.

Information describing the biogenic carbon content at the plant gate

Name	Value	Unit
Biogenic carbon content in product	4.9	kg C
Biogenic carbon content in accompanying packaging	0.01	kg C

Since the end-of-life of the product packaging is not declared in module A5, its carbon uptake is not included in modules A1-A3.

Integration into building (A5)

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

Name	Value	Unit
Packaging (PE film)	0,051	kg
Packaging (hoops)	0,002	kg
Packaging (Kraftliner)	0,007	kg

The following technical information represents the basis for the declared module or can be used for the development of specific scenarios in the context of a building evaluation if modules are not declared (MND).

Reference utilisation duration

The product is tested according to the normative product requirements. When used according to the rules and the state of the art, the reference service life corresponds to 10-40 years. These periods are to be used for further calculations and do not constitute manufacturer's guarantees.

Name	Value	Unit
Reference service life	10 - 40	a
Life Span (according to BBSR)	10 - 40	a
Declared product properties (at the gate) and finishes	according to EN 622-5	-
Design application parameters (if instructed by the manufacturer), including the references to the appropriate practices and application codes	Service life depending on intended use	-
An assumed quality of work, when installed in accordance with the manufacturer's instructions	according to the processing instructions EGGER Eurodekor/Eurodekor Plus, available at www.egger.com	-
Outdoor environment, (for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature	not relevant, given use in interiors	-
Indoor environment (for indoor applications), e.g. temperature, moisture, chemical exposure Chemical exposure according to EN 12720	Class 1B	-
Resistance to scratching according to EN 438-2	≥2	N
Maintenance e.g. required frequency, type and quality and replacement of components	regular visual inspection and replacement in case of damage	-

You can find detailed processing and usage instructions for download on the product pages at www.egger.com

End of life cycle (C1-C4)

Name	Value	Unit
For energy recovery [balance moisture 12%]	12,7	kg/m²

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

Name	Value	Unit
Net flow in module D [balance moisture 12 %]	11,9	kg/m²
Moisture during thermal reuse	12	%
Processing rate	100	%
Efficiency of the system	61	%

The EGGER PerfectSense Lacquered Chipboard 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 the product, 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 (EU28), given that the sales market of EGGER PerfectSense Lacquered Chipboard is focussed on Europe. The scenario foresees a processing rate of the product after removal from the building of 100%. The assumption must be adapted accordingly after using the results in the context of the building. A balance moisture of 12% must be assumed at the product's end of life. 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 one square meter of EGGER PerfectSense Lacquered Chipboard produced with an average surface weight of 12 kg/m².

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = 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 m² PerfectSense Lackplatte Span (12 kg/m²)

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 eq	-1.35E+01	0	3.8E-02	1.85E+01	0	-8.49E+00
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	4.77E+00	0	3.81E-02	9.35E-02	0	-8.43E+00
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	-1.83E+01	0	-3.72E-04	1.84E+01	0	-5.54E-02
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	3.23E-03	0	2.56E-04	1.98E-05	0	-1.19E-03
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	6.3E-11	0	3.73E-15	1.37E-12	0	-7.7E-11
Acidification potential of land and water (AP)	mol H^+ eq	1.13E-02	0	1.27E-04	2.05E-04	0	8.65E-03
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	1.58E-05	0	1.36E-07	2.73E-07	0	-1.55E-05
Eutrophication potential aquatic marine (EP-marine)	kg N eq	4.63E-03	0	5.81E-05	4.6E-05	0	2.04E-03
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	4.14E-02	0	6.51E-04	4.83E-04	0	2.4E-02
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	9.27E-03	0	1.14E-04	1.24E-04	0	8.48E-03
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	2.16E-06	0	3.83E-09	2.55E-08	0	-1.64E-06
Abiotic depletion potential for fossil resources (ADPF)	MJ	1.01E+02	0	4.99E-01	1.7E+00	0	-1.68E+02
Water use (WDP)	m^3 world eq deprived	2.37E-01	0	4.25E-04	2.13E-02	0	-5.38E-01

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m² PerfectSense Lackplatte Span (12 kg/m²)

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	1.25E+02	0	3.46E-02	1.87E+02	0	-5.31E+01
Renewable primary energy resources as material utilization (PERM)	MJ	2.11E+02	0	0	-1.86E+02	0	0
Total use of renewable primary energy resources (PERT)	MJ	3.36E+02	0	3.46E-02	9.41E-01	0	-5.31E+01
Non renewable primary energy as energy carrier (PENRE)	MJ	7.01E+01	0	5.01E-01	3.06E+01	0	-1.68E+02
Non renewable primary energy as material utilization (PENRM)	MJ	3.11E+01	0	0	-2.89E+01	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	1.01E+02	0	5.01E-01	1.7E+00	0	-1.68E+02
Use of secondary material (SM)	kg	5.19E+00	0	0	0	0	0
Use of renewable secondary fuels (RSF)	MJ	1.3E+01	0	0	0	0	1.76E+02
Use of non renewable secondary fuels (NRSF)	MJ	0	0	0	0	0	2.67E+01
Use of net fresh water (FW)	m^3	1.76E-02	0	4E-05	8.98E-04	0	-3.53E-02

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m² PerfectSense Lackplatte Span (12 kg/m²)

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	7.13E-06	0	2.65E-12	1.47E-10	0	-1.03E-08
Non hazardous waste disposed (NHWD)	kg	1.09E-01	0	8.17E-05	1.28E-03	0	4.09E-03
Radioactive waste disposed (RWD)	kg	2.39E-03	0	9.3E-07	2.71E-04	0	-1.52E-02
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	1.27E+01	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 m² PerfectSense Lackplatte Span (12 kg/m²)

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Incidence of disease due to PM emissions (PM)	Disease incidence	1.13E-07	0	7.27E-10	1.7E-09	0	-2.01E-08
Human exposure efficiency relative to U235 (IR)	kBq U235 eq	2.63E-01	0	1.4E-04	4.59E-02	0	-2.58E+00

Comparative toxic unit for ecosystems (ETP-fw)	CTUe	2.67E+01	0	3.54E-01	7.44E-01	0	-4.19E+01
Comparative toxic unit for humans (carcinogenic) (HTP-c)	CTUh	3.15E-09	0	7.29E-12	2.13E-11	0	-2.03E-10
Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	5.09E-08	0	4.47E-10	7.81E-10	0	4.74E-08
Soil quality index (SQP)	SQP	5.67E+02	0	2.11E-01	6.11E-01	0	-3.5E+01

Limitation note 1 - applies to the indicator Potential effect from human exposure to U235: This impact category mainly addresses the possible effect of low dose ionising radiation on human health in the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents and occupational exposure, nor does it consider the disposal of radioactive waste in underground facilities. Potential ionising radiation from soil, radon and some building materials is also not measured by this indicator.

Limitation note 2 - applies to the indicators Potential for Abiotic Resource Depletion - Non-Fossil Resources, Potential for Abiotic Resource Depletion - Fossil Fuels, Water Depletion Potential (User), Potential Ecosystem Toxicity Comparison Unit, Potential Human Toxicity Comparison Unit - Carcinogenic Effect, Potential Human Toxicity Comparison Unit - Non-Carcinogenic Effect, Potential Soil Quality Index:
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.

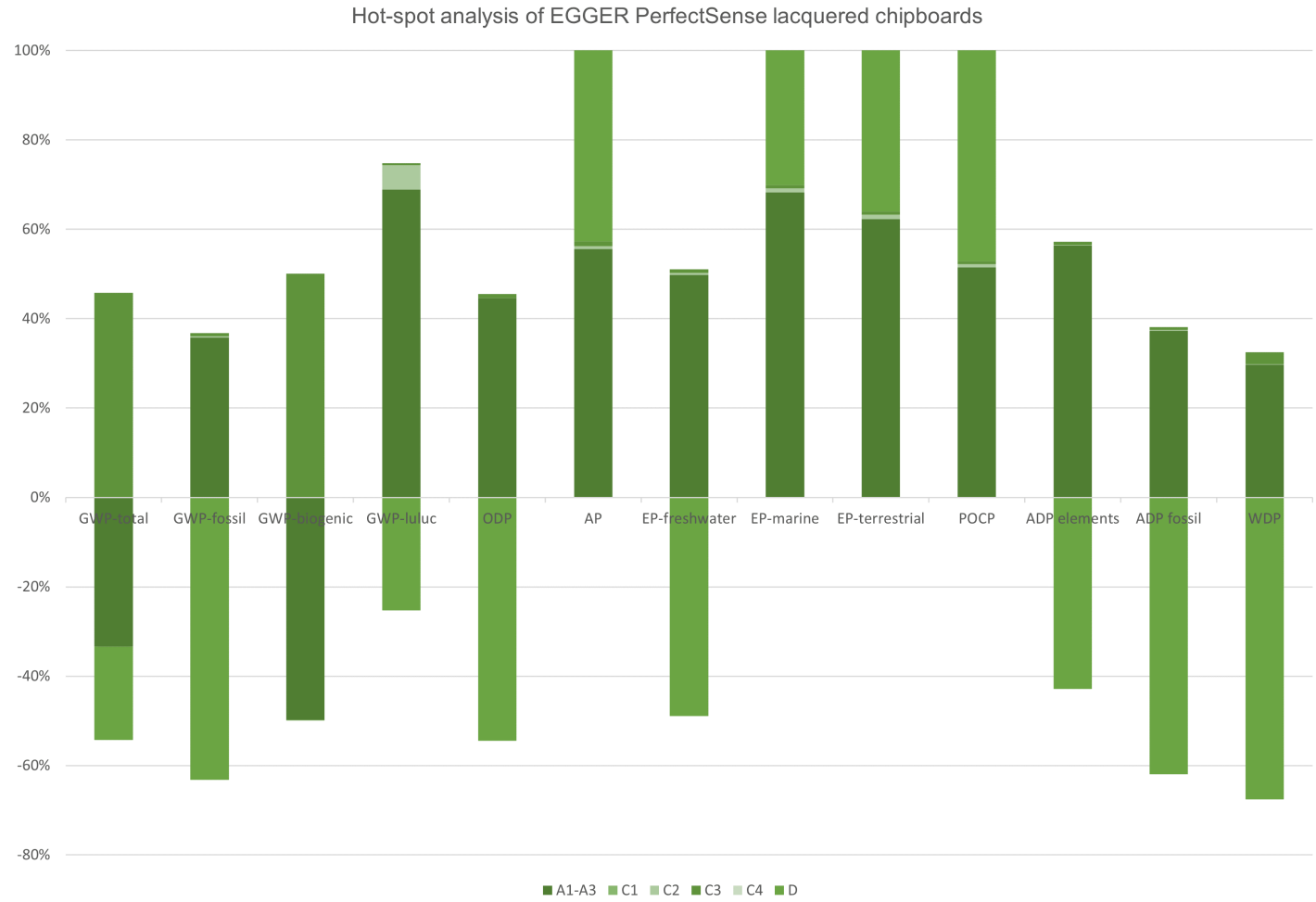
6. LCA: Interpretation

The following interpretation includes a summary of the LCA results relative to a declared unit of 1 m³ average EGGER PerfectSense Lacquered Chipboard.

For the global warming potential (GWP) during the production phase (Module A1-A3) of the EGGER PerfectSense Lacquered Chipboard, 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 upon the energy utilisation at the end of the product life cycle (Module C3) does the stored carbon leave the product system as a material-specific characteristic of the secondary fuel.

The negative values in Module D can be explained through the fact that the energy generated by the energetic 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.



In the production of coated and lacquered PerfectSense chip products, the production of raw chipboard and impregnation, including their upstream chains, as well as the use of electricity for coating can be identified as the most significant influencing factors. Electricity and steam supply as well as the upstream costs for the production of the UMF gluing system have the greatest influence on the potential environmental impact from the production of the raw chipboard. In the case of

impregnation, the decorative paper as well as urea and melamine impregnation resin play a dominant role with regard to the considered environmental indicators. The potential depletion of the stratospheric ozone layer (ODP) is also significantly influenced by the lacquer system and its associated upstream chains.

The use of renewable primary energy (PERT) is due to the material use of biomass in the product. Looking at the use of non-renewable primary energy (PENRT), this is mainly allocated for the production of the raw boards.

7. Requisite evidence

7.1 Formaldehyde emissions
Measurement centre: Entwicklungs und Prüflabor Holztechnologie GmbH (EPH Dresden)
Test report: PB 2521401 2021 3+4 A1
Test basis: Emission test according to TÜV PROFiCERT product Inferior award criteria version 1.3 of 01.01.2021 Initial test / Formaldehyde *EN 16516*
Test result: Measured value 0.027 - 0.030 mg/m³ and 0.022 - 0.024 ppm. The limit value for formaldehyde class E1 according to the ChemVerbotsV is complied with.

Test basis: Emission test with regard to formaldehyde in accordance with TÜV PROFiCERT product Interior award criteria version 1.3 of 01.01.2021 Incl. VOC screening Day 3
Test report: PB 2521401 2021 5+6
Test result: French VOC regulation Class A+ fulfilled

7.2 MDI emissions
Measurement centre: Wessling Beratende Ingenieure GmbH,
Test report: IAL-08-0310 of 04.09.2008
Test basis: BIA 7670. The test looked at uncoated Raw chipboards with a total surface of 1 m². They were set in a 1000l test chamber with an air exchange rate of 1 h--1. The edges of the test pieces were sealed with aluminium adhesive tape. Sampling took place 24 h after chamber loading. The obtained sample was analysed for MDI emissions together with the blank value of the emission test chamber.
Result: The emission of MDI and other isocyanates in the test chamber were below the detection limit of the analytical method after 2 hours. The test method is identical to the NIOSH P&CAM 142 test required in the PCR document. Given that the recipe hasn't changed, the said test reports maintain their validity.

7.3 Measurement in accordance with the Waste Wood Ordinance (AltholzVO)
Measurement centre: Eurofins Umwelt West GmbH
Test basis: Continuous testing of the chipboard according to the German AltHolzVO.
Result: statistical mean values of the year 2021 for the Brilon plant, own evaluation of the individual reports PCP (pentachlorophenol) 0.2 mg/kg dry matter (limit value 3 mg/kg dry matter) lead: 4 mg/kg dry matter (limit value 30 mg/kg dry matter)
Cadmium: 0.2 mg/kg dry matter (limit value 2 mg/kg dry matter)
Arsenic: all measurements below the limit of determination (limit value 2 mg/kg dry matter)
Mercury: all measurements below the limit of determination (limit value 0.4 mg/kg dry matter)
PCB (polychlorinated biphenyls): all measurements below the limit of determination (limit value 5 mg/kg dry matter total)
Total chlorine compounds: 150 mg/kg dry matter (limit value 600 mg/kg dry matter)
Total fluorine compounds: all measurements below the limit of determination (limit value 100 mg/kg dry matter)

7.4 VOC emissions
Measurement centre: Entwicklungs und Prüflabor Holztechnologie GmbH (EPH Dresden)
Test report: PB 2521401 2021 1 A1
Method: Emission test according to TÜV PROFiCERT product Inferior award criteria version 1.3 of 01.01.2021 Initial test including assessment according to AgBB 2018
Test result: The product tested meets the requirements of the principles for the health assessment of building products (*AgBB* scheme 2018, NIK list 2018)

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

Name	Value	Unit
TVOC (C6 - C16)	≤ 300	µg/m³
Sum SVOC (C16 - C22)	≤ 100	µg/m³
R (dimensionless)	0.505	-
VOC without NIK	≤ 100	µg/m³

AgBB result overview (3 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16)	≤ 1000	µg/m³
Sum SVOC (C16 - C22)	≤ 30	µg/m³
R (dimensionless)	1.012	-
VOC without NIK	≤ 50	µg/m³

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