ENVIRONMENTAL PRODUCT DECLARATION

in accordance with *ISO 14025* and *EN 15804+A2*

Declaration holder	Elka Holzwerke GmbH
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Date of issue	21 July 2026
Valid until	20 July 2031

Chipboard and ESB boards

elka-Holzwerke GmbH

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1. General information

elka-Holzwerke GmbH

Programme sponsor

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

Declaration number

EPD-ELK-20260448-IBA1-DE

This declaration is based on the product category rules:

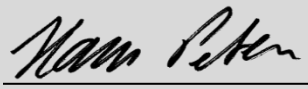
Wood-based materials, 1 August 2021
(PCR verified and approved by the Independent Council of Experts (SVR))

Date of issue

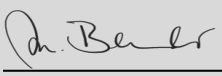
21 July 2026

Valid until

20 July 2031



Hans Peters, Dipl.-Ing.
(Chair of the Board of the Institute for Construction and the Environment e.V.)



Dr Martina Bender
(Managing Director of the Institut Bauen und Umwelt e.V.)

Chipboard and ESB boards

Holder of the declaration

Elka Holzwerke GmbH Hochwaldstrasse 44
54497 Morbach,
Germany

Declared product/declared unit

1 m^3 of average chipboard and OSB

Scope:

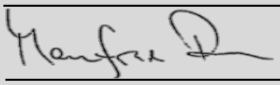
The contents of this declaration are based on the information provided by the following manufacturer regarding the production of raw chipboard and ESB boards:
elka Holzwerke GmbH, Morbach, Germany

The life cycle assessment in this declaration covers 100% of the production of chipboard and esb boards from the above-mentioned factory in 2022. This declaration may be used for chipboard and esb boards from the above-mentioned manufacturer.
The holder of the declaration is liable for the underlying information and evidence; the IBU accepts no liability with regard to manufacturer information, life cycle assessment data and supporting evidence.

The EPD was prepared in accordance with the requirements of EN 15804+A2. In the following, the standard is referred to simply as *EN 15804*.

Verification

The European standard EN 15804 serves as the core PCR
Independent verification of the declaration and data in accordance with ISO 14025:2011
☐ internal ☒ external



Manfred Russ,
(Independent verifier)

2. Product

2.1 Product description/product definition:

chipboard, raw

Unfinished chipboard is a sheet-form wood-based material with a three-layer structure. It consists of a core layer of coarser chips and two face layers of finer material. The raw materials used are mainly fresh sawmill residues in a chip- to dust-like consistency. The product is supplied uncoated.

esb board P5 (elka strong board)

The esb board is a homogeneous wood-based material made from defined, fresh, coarse softwood chips. The board has a uniform structure. It is produced in type P5 and is therefore used in structural timber construction. The esb board is low in formaldehyde and meets enhanced requirements regarding emission properties. It, too, is manufactured and supplied uncoated.

Both products are manufactured at the Morbach plant.

For placing on the market in the EU/EFTA (with the exception of Switzerland), Regulation (EU) *No 305/2011* of 9 March 2011 applies. The products require a Declaration of Performance in accordance with *EN 13986:2015* 'Wood-based materials for use in construction — Properties, assessment of conformity and marking', and must bear the CE marking. EN 312:2010-12, 'Particleboard – Requirements'; German version *EN 312:2010*, also applies. The relevant national regulations apply to the use of the products.

2.2 Application:

Raw chipboard

Unfinished chipboard from elka-Holzwerke GmbH is used for interior fit-out, furniture manufacture, the door industry and in non-load-bearing structural applications. Typical areas of use include cabinet bodies and fronts, wall and ceiling cladding, partition walls and substructures. The selection of the appropriate board type is carried out in accordance with *DIN EN 312*.

esb board P5 (elka strong board)

The esb board is a structural wood-based panel in accordance with *DIN EN 312:2010-12* and meets the requirements of panel class P5. It is suitable for use in damp environments and can be used for load-bearing and bracing purposes in timber construction, e.g. as cladding in walls, roofs or ceilings. The esb board is a wood-based material for use in construction in accordance with the harmonised standard *DIN EN 13986*, which regulates the properties, conformity assessment and CE marking. The product therefore meets the requirements of Regulation (EU) *No 305/2011* (Construction Products Regulation) for the European market.

2.3 Technical data –

Requirements according to *EN 312*
(simplified overview for panel types P1 – P7)

Structural data

Illustrative technical values for an esb P5 panel.

Description	Value	Unit
Bulk density	630–640	kg/m³
Flexural strength (longitudinal) EN 310	12–18	N/mm²
Modulus of elasticity (longitudinal) EN 310	1900–2550	N/mm²
Material moisture content on delivery EN 322	10–11	%
Thermal conductivity EN 13986	0.12	W/(mK)
Water vapour diffusion resistance factor (dry/wet)	80/40	-
Sound absorption	0.25	%
Formaldehyde emissions in accordance with EN 312	0.05	µg/m³

Note: Please refer to the manufacturers' product data sheets for specific technical data

2.4 Condition on delivery

The chipboard and esb boards from elka-Holzwerke GmbH are supplied uncoated. Both products are available in various thicknesses, widths and lengths.
The available dimensions are:

Thicknesses: 9 mm to 50 mm

Widths: 200 mm to 2,100 mm

Lengths: 200 mm to 5,500 mm

Non-standard sizes outside these standard dimensions are available on request. The boards are manufactured in accordance with the relevant application classes as specified in *DIN EN 312:2010-12*.

2.5 Base materials/additives

Composition

Designation	Value	Unit
Wood (sawmill by-products)	80.83	%
Water	6.99	%
MUF adhesive	5.49	%
UF adhesive	5.41	%
Water-repellent treatment	0.73	%
Hardener	0.32	%
Formaldehyde scavenger	0.22	%
Flame retardant	0.02	%

The product has an average bulk density of approx. 631.32 kg/m³. The functional chemical groups of the flame retardants are nitrogen compounds.

The chipboard and esb boards produced by elka-Holzwerke GmbH consist of fine wood particles, binders and other additives. The wood content is 80.83% by mass and consists entirely of sawmill by-products (e.g. sawdust, wood chips) generated at the company's own sawmill. Spruce is the predominant timber species used. The wood particles used are particularly low in emissions and have a very low VOC profile.

Urea-formaldehyde resins (UF) and melamine-urea-formaldehyde resins (MUF) are used as binders.
Other additives include paraffin-based water-repellents, hardeners, formaldehyde scavengers and, where required, flame retardants.

Our chipboard contains no substances from the ECHA list of Substances of Very High Concern (SVHC) subject to authorisation in concentrations exceeding 0.1% by mass. Furthermore, they do not contain any CMR substances in categories 1A or 1B that appear on the Candidate List in concentrations exceeding 0.1% by mass. Nor do they contain any biocidal products as defined by the Biocidal Products Regulation (EU) No 528/2012, nor have they been treated with any biocidal products.

1) The product/article/at least one sub-article contains substances from the ECHA list of Substances of Very High Concern (SVHC) eligible for authorisation (date: 12 May 2026) in concentrations exceeding 0.1% by mass: no.

2) The product/article/at least one component contains other CMR substances of category 1A or 1B that are not on the Candidate List, in concentrations exceeding 0.1% by mass in at least one component: no.

3) Biocidal products have been added to this construction product or it has been treated with biocidal products (it is therefore a treated article within the meaning of the Biocidal Products Regulation (EU) No 528/2012): no.

2.6 Manufacture

Only wood residues from the company's own sawmill and from regional suppliers are used in the manufacture of the chipboard and esb boards produced by elka-Holzwerke GmbH. These are sawmill by-products such as wood chips, shavings and offcuts. Waste wood and recycled materials are not used.

The manufacturing process comprises the following steps:

1. Chipping or processing of the raw wood materials

2. Drying of the wood chips to the required moisture content

3. Sorting the wood shavings by size (top and middle layers)

4. Coating the shavings with thermosetting binders (UF, MUF); addition of flame retardants where required

5. Formation of mats by spreading the glued chips in several layers

6. Compression of the chip cake under high pressure and temperature in a press
7. Conditioning of the raw panels to stabilise moisture content

8. Sanding and sizing of the resulting raw panels to the required dimensions

9. (Optional) Fitting of tongue and groove for flooring panels

Subsequent packaging and labelling of the finished boards The adhesives used cure completely during the pressing process. The finished boards are destacked and packaged for storage.
The entire manufacturing process takes place at the Morbach site. Production waste such as offcuts or sanding dust is recycled internally, either as raw material or for energy recovery.

2.7 Environment and health during production

The manufacturing conditions do not require any special health and safety measures apart from those stipulated by the authorities for the specific work area, e.g. high-visibility vests, safety footwear, dust masks. The *MAK values* (Germany) are not exceeded at any stage of the production process.

Air: The exhaust air generated during production is treated in accordance with statutory requirements. Emissions are below the limits set by *the TA Luft*.

Water/soil: There is no contamination of water or soil.

Noise control: All values measured both inside and outside the production facilities are below the requirements applicable in Germany.
Noisy plant components, such as machining operations, are suitably insulated through structural measures

Energy: The energy management system *(ISO 50001)* is geared towards the continuous reduction of energy consumption and CO_2 emissions.

2.8 Product processing/installation

Chipboard and esb boards from elka-Holzwerke GmbH can be processed using standard woodworking machinery.
The products can be sawn, milled, planed, sanded and drilled.

During processing, care must be taken to ensure that the products are installed in accordance with building physics principles, particularly when used in damp areas or in timber construction.

Wood dust is produced during processing. The standard health and safety measures must therefore be observed:

- Wearing a dust mask
- Wear gloves and protective clothing
- Use of extraction systems on machinery

For certain applications, such as flooring or load-bearing structures, the relevant standard requirements and installation instructions must be observed.

2.9 Packaging

The products are packed securely for transport. Materials such as solid timber, PE film, paper and cardboard are used in the following average quantities per cubic metre of product:

- Solid timber 0.17 kg/m³
- PE film 0.06 kg/m³
- Paper and cardboard 0.01 kg/m³

The transport packaging used for delivery – such as cardboard boxes, PE film/straps and solid wood supports – can be sent for recycling provided it is sorted by type. Alternatively, thermal recovery is permitted if material-based recycling is not possible.

2.10 Condition of use

The composition of the chipboard and esb boards corresponds to the raw materials listed in section 2.5 (Raw materials). The binders are chemically stable and firmly bound to the wood.

2.11 Environment and health during use

Environmental protection: Based on current knowledge, there are no risks to water, air or soil when the
the products described, according to current scientific knowledge

arise.

Health protection: Based on current knowledge, no adverse health effects or impairments are to be expected under normal use in accordance with the intended purpose of chipboard. Emissions are detectable only in quantities that pose no risk to health.

2.12 Reference service life

The service life of chipboard and esb boards from elka-Holzwerke GmbH depends on the area of application and, when installed correctly, is up to 50 years (in accordance with *the BBSR table*). Durability in service depends on the respective application class in accordance with *DIN EN 312*.

2.13 Exceptional conditions: Fire

Unfinished chipboard has the following fire behaviour in accordance with *EN 13501-1; EN 13986*.

Fire protection

Designation	Value
Building material class	D
Dripping when burning	d0
Smoke emission	s2

Change in physical state:
Burning dripping is not possible, as raw chipboard does not become liquid when heated. It is not necessary to demonstrate the toxicity of fire gases for Class D building materials.

Water

The product contains no constituents which, if leached out, would pose a risk to water. As prolonged exposure to water leads to the destruction of the board's composite structure, the products must be protected from continuous exposure to moisture.

Mechanical damage

Under mechanical stress, the product exhibits a brittle fracture behaviour. Splintering and sharp fracture edges may occur. Resistance to mechanical impact corresponds to the respective board types P1–P7.

2.14 Post-use phase

Reuse:
Chipboard and esb boards can be collected separately by type during the demolition or conversion of buildings as part of a selective demolition process and sent for reuse. This can be done either for their original intended purpose or in alternative applications, provided the structural and technical condition of the boards permits this.

Recycling:
If the boards are sorted by type, material recycling in the form of reintroduction into the wood-based materials manufacturing process is possible. If reuse or material recycling is not practicable, the boards can be used for energy recovery due to their high calorific value. In this process, they are used as a secondary fuel in suitable plants (e.g. biomass power stations).

2.15 Disposal

Any waste or end-of-life chipboard and ESB boards should, as a priority, be directed towards reuse or material recycling. These measures are in line with the principle of cascading use and are preferable to direct energy recovery.

Landfilling of waste wood is not permitted under Section 9 of the Waste Wood Ordinance (AltholzV). Disposal is generally carried out via authorised collection and recovery systems.
Waste code (*AVV/EAK*): 17 02 01 – Wood

2.16 Further information

Further information can be found on the website: www.elka-holzwerke.de

3. LCA: Calculation rules

3.1 Declared unit

The reference for this declaration is 1 m^3 of chipboard and esb board with an average mass of 631.32 kg/m^3.

Declared unit and mass reference

Designation	Value	Unit
Declared unit	1	m^3
Mass reference	631.32	kg/m^3
Layer thickness	0.019	m
Grams per square metre	12	kg/m^2
Bulk density	631.32	kg/m^3

The declared unit for environmental assessment is the production of 1 m^3 of chipboard and ESB board with a mass of 631.32 kg/m^3, a water content of approx. 7 per cent and a content of adhesives and additives of approx. 12.2 per cent.

The composition corresponds to the average weighted by production volume.

3.2 System boundary

The declaration type corresponds to a cradle-to-factory-gate EPD – with options. It covers the production stage, i.e. from the provision of raw materials to the factory gate of Production (cradle-to-gate, Modules A1 to A3), as well as the module A5 and parts of the end-of-life phase (Modules C1 to C4).

In addition, the potential benefits and impacts beyond the product's life cycle are considered (Module D).

Specifically, Module A1 accounts for the sourcing of wood raw materials as well as the sourcing of adhesives and additives. The transport of raw materials used as feedstock to the factory is taken into account in Module A2. Module A3 covers the procurement of fuels, operating materials, product packaging and electricity, as well as on-site manufacturing processes. These essentially comprise the processing, drying (including emissions), sorting and pressing of the raw materials.

An electricity mix comprising 20% photovoltaic and 80% wind energy is used for the manufacture of the declared product. The supply of this electricity mix is verified by Guarantees of Origin (GoO) and by corresponding proof of supply or self-generation. The GWP of the

electricity mix used in Modules A1–A3, comprising 20% photovoltaic and 80% wind energy, is 0.0164 kg CO_2e/kWh. The environmental impacts were calculated on the basis of the use of green electricity, taking into account the residual electricity mix for the remaining electricity. The proportion of total electricity demand covered by green electricity is 100%.

Module A5 exclusively models the disposal of product packaging, which includes the release of the biogenic carbon it contains as well as the primary energy it contains (PERM and PENRM).

For Module C1, manual dismantling with no associated loads is assumed. Module C2 takes into account transport to the disposal facility, and Module C3 covers the processing and sorting of waste wood. Furthermore, in Module C3, in accordance with *EN 16485,* the CO_2equivalents of the wood-inherent carbon contained in the product, as well as the renewable and non-renewable primary energy (PERM and PENRM) contained in the product, are recorded as outputs. Module C4 was calculated in accordance with normative requirements and shows no waste destined for landfill. This is because, at the end of its life (EoL), the product system becomes waste wood, which, in accordance with *the Waste Wood Ordinance (2020)*, must not be landfilled but must be recovered thermally or through material recycling.

Module D assesses the thermal recovery of the product at the end of its life cycle, as well as the resulting potential benefits and burdens, in the form of a system extension.

3.3 Estimates and assumptions

In principle, all material and energy flows associated with the processes required for production were determined on the basis of questionnaires. On-site emissions from the combustion of wood are modelled using a background dataset from 2023 sourced from the *Sphera* database *(2024)*.
Emissions from wood drying, internal combustion systems and the curing of adhesives are based on literature sources and are documented in detail in *Rüter, Diederichs (2012)*. As a conservative estimate, the transport distance for disposal is assumed to be 50 km by lorry; the supply of packaging materials is assumed to be 100 km by lorry; and the transport of the product from the construction site for reprocessing and reuse is assumed to be 50 km by lorry. All other data are based on real-world data where available.
The use of spruce is assumed, with small quantities of other coniferous woods also covered by this. To calculate the environmental impacts of upstream processes (e.g. the sawn timber supply chain), a model was used which is described on pages 73–78 in *Rüter, Diederichs (2012)*.
For the end-of-life scenario, a collection rate of 100 per cent is assumed, with no losses due to the shredding of the material.

3.4 Cutting-off rules

The decision on which flows to consider is based on existing studies on the life cycle assessment of wood products. At a minimum, those material and energy flows were assessed that account for 1 per cent of the input of renewable or non-renewable primary energy or mass, with the total of the flows not considered not exceeding 5 per cent. Furthermore, care was taken to ensure that no material and energy flows were neglected which have particular potential to exert a significant influence on the environmental indicators.

The costs of providing the infrastructure (machinery, buildings, etc.) for the entire system under consideration were not taken into account. This is based on the assumption that the total costs of constructing and maintaining the infrastructure do not exceed the 1 per cent of total costs described above. By contrast, the energy expenditure required to operate the infrastructure, in the form of heat and electricity, was taken into account. Material and energy flows for installation (A5) and decommissioning (C1) were disregarded in accordance with the cut-off rules.
Detailed information on the culling rules is documented in *Rüter, Diederichs 2012*.

3.5 Background data

All background data were taken from the *Sphera* database *(2024*) and the final report ‘Life Cycle Assessment: Basic Data for Timber-Based Construction Products’ by *Rüter and Diederichs (2012)*. The latter forms the basis for a regularly updated, internal database, from which the modelling of the pre-harvest forestry chain and the processes for representing the assumptions listed in Chapter 3.3 were derived.

3.6 Data quality

The foreground data were collected at the plant over a period of twelve consecutive months in 2022.
The primary data collected were validated on the basis of quantity and against plausibility criteria. Overall, the data quality of the primary data can be described as very good. The background data on wood raw materials used for material and energy purposes, taken from the literature and excluding forest timber, are from the years 2008 to 2012. The supply of forest timber was taken from a publication from 2008, which is based primarily on data from 1994 to 1997. The data is up to date, is regularly checked and updated where necessary. All other figures were taken from the *Sphera* database *(2024*) and are no more than three years old. Overall, the data quality can be described as good. The data quality complies with *EN 15941:2024*.

3.7 Study period

The primary data was collected for the plant in Morbach (DE) over a period of twelve consecutive months from January 2022 up to and including December 2022.

3.8 Geographical representativeness

Country or region in which the declared product system is manufactured and, where applicable, used and treated at the end of its life: Germany

3.9 Allocation

The allocations carried out comply with the requirements of *EN 15804+A2* and *EN 16485* and are explained in detail in *Rüter, Diederichs (2012*).

Essentially, the following system extensions and allocations were carried out.

General
Flows of material-inherent properties (biogenic carbon and embodied primary energy) were generally allocated according to physical causality. All other allocations in the case of linked co-productions were made on an economic basis. An exception is the allocation of the heat required in combined heat and power (CHP) plants, which was allocated on the basis of the exergy of the products electricity and process heat.

Module A1

- Forestry: All costs in the forestry upstream chain were allocated to the products sawlogs and industrial timber using economic allocation factors based on their prices.

Module A3

- Wood-processing industry: In the case of associated co-productions, costs were allocated economically to the main products and residues on the basis of their prices.
- Thermal and electrical energy produced from the disposal of waste generated in Module A3 (with the exception of wood-based materials) is fed back into the product system in the form of a notional loop. The energy generated and accounted for as a loop accounts for less than 1 per cent of the energy input in Module A3.
- In the case of combined heat and power generation, all costs associated with combustion were allocated to these two products according to their exergy.
- The provision of waste wood as fuel does not take into account any costs from its previous life cycle.

Module D

- The system scope extension carried out in Module D corresponds to an energy recovery scenario for waste wood.

3.10 Comparability

In principle, a comparison or evaluation of EPD data is only possible if all data sets to be compared have been prepared in accordance with *EN 15804* and the building context or product-specific performance characteristics are taken into account. The life cycle assessment modelling was carried out using the 'Sphera LCA for Experts' software; see *Sphera (2026)*. All background data was taken from Sphera's 'MLC CUP' database, *Sphera (2024),* or is derived from references.

4. LCA: Scenarios and further technical information

Characteristic product properties: biogenic carbon

Raw chipboard and esb chipboard are mainly made from wood and therefore contain biogenic carbon.

Information describing the biogenic carbon content at the factory gate

Designation	Value	Unit
Biogenic carbon in the product	255.15	kg C
Biogenic carbon in the associated packaging	0.16	kg C

At the factory gate and during use, the product contains 255.15 kg of biogenic carbon per cubic metre, which corresponds to a CO_2equivalent of 935.55 kg. The wooden packaging contains 0.16 kg C.

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

The following technical information forms the basis for the declared modules or can be used to develop specific scenarios in the context of a building assessment where modules are not declared (ND).

Installation in the building (A5)

Module A5 is declared; however, it contains only information on the disposal of the product packaging and no information whatsoever on the actual installation of the product in the building.

Designation	Value	Unit
Plastic packaging for thermal waste treatment	0.06	kg
Overall efficiency of thermal waste treatment (plastics)	38	%
Wood/paper packaging for thermal waste treatment	0.17	kg
Overall efficiency of thermal waste treatment (wood)	44	%
Total electrical energy exported	1.50	MJ
Total thermal energy exported	2.04	MJ

The quantity of packaging material generated in Module A5 per m^3 of product as waste for thermal recovery, and

The resulting exported energy is shown in the previous

is specified in the table as technical scenario information.

Service lives can be found in the *BNB's* reference service life table.

End of life (C1–C4)

A scenario for the end of the life cycle in Germany is assumed. Accordingly, the German electricity mix is used for the processing of the material.

Description	Value	Unit
Product share until the end of the waste status	631.32	kg
Redistribution transport distance of waste wood (Module C2)	50	km

For a scenario in which the product reaches the end of its waste status, a collection rate of 100% is assumed, with no losses due to the shredding of the material.

Reuse, recovery and recycling potential (D), relevant scenario details

Module D describes all impacts and potential benefits arising from the energy recovery of the product following complete waste treatment.

Designation	Value	Unit
Thermal recovery scenario: electricity that can be generated (per net flow of the declared unit)	537.42	kWh
Thermal scenario: usable waste heat (per net flow of the declared unit)	3,918.49	MJ

The product is recovered at the end of its life cycle in the same composition as the declared unit described. As required in PCR Part A, the scenario is presented as a 100% scenario.

Scenario (energy recovery)

This scenario assumes purely energy recovery in a waste-to-energy plant with an overall efficiency of 54.54% and an electrical efficiency of 18.04%, such that R1 > 0.6. As 29.22 kg (dry weight) of waste wood is used in Modules A1–A3, the net flow assessed in Module D corresponds to 481.08 kg

of waste wood (dry weight), including the adhesives it contains. Taking the proportion of adhesives into account, Module D produces a potential 537.42 kWh of electricity and 3,918.49 MJ of thermal energy per declared unit.
The exported energy has the potential to substitute fuels from fossil sources, whereby, in this scenario for recovery in Germany, it is assumed that the thermal energy is generated from natural gas and that the substituted electricity corresponds to the German electricity mix (consumption mix).

5. LCA: Results

The declared unit of 1 m^3 of esb chipboard causes the following environmental impacts.

SPECIFICATION OF SYSTEM BOUNDARIES (X = INCLUDED IN LIFE CYCLE ASSESSMENT; MND = MODULE OR INDICATOR NOT DECLARED;
MNR = MODULE NOT RELEVANT)

Production stage			Construction stage		Use phase							Disposal stage				Credits and loads outside the system boundary
Raw material supply	Transport	Manufacture	Transport from the manufacturer to the point of use	Assembly	Use/Application	Maintenance	Repair	Replacement	Renewal	Energy consumption for operating the building	Water consumption for the operation of the building	Dismantling/demolition	Transport	Waste treatment	Disposal	Potential for reuse, recovery or recycling
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MON	X	MON	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

LIFE CYCLE ASSESSMENT RESULTS – ENVIRONMENTAL IMPACTS in accordance with EN 15804+A2: 1 m³ chipboard and ESB board

Indicator	Unit	A1	A2	A3	A5	C1	C2	C3	C4	D
Total GWP	kg CO_2equivalent	-8.26E+02	1.16E+00	9.79E+00	4.08E-01	0	9.75E-01	9.45E+02	0	-6.35E+01
GWP (fossil)	kg CO_2eq.	1.09E+02	1.15E+00	1.01E+01	8.16E-02	0	9.73E-01	9.25E+00	0	-6.31E+01
GWP – biogenic	kg CO_2equivalent	-9.35E+02	7.41E-03	-2.79E-01	3.27E-01	0	2.74E-03	9.36E+02	0	-3.7E-01
GWP-luluc	kg CO_2eq.	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	ND
ODP	kg CFC-11 equivalent	6.42E-07	3.3E-13	4.85E-09	2.7E-14	0	9.86E-14	2.9E-10	0	2.18E-10
AP	mol H^+ equivalents	1.95E-01	6.53E-03	3.93E+00	4.29E-05	0	5.83E-03	1.45E-02	0	6.14E-02
EP-freshwater	kg P-eq.	6.71E-03	3.21E-05	2.06E-03	2.52E-06	0	1.65E-05	1.24E-02	0	9.19E-03
EP-marine	kg N-eq.	8.42E-02	3.08E-03	2.04E+00	1.14E-05	0	2.86E-03	4.52E-03	0	-1.17E-02
EP-terrestrial	mol N-eq.	8.5E-01	3.44E-02	2.24E+01	1.89E-04	0	3.17E-02	4.66E-02	0	2.46E-01
POCP	kg NMVOC-eq.	1.8E-01	6.17E-03	5.49E+00	3.05E-05	0	5.48E-03	1.09E-02	0	-5.06E-02
ADPE	kg Sb-eq.	1.41E-05	2.09E-07	9.03E-06	2.92E-10	0	8.33E-08	1.95E-06	0	-4.31E-06
ADPF	MJ	2.54E+03	2.26E+01	9.92E+01	5.75E-02	0	1.28E+01	1.3E+02	0	-4.03E+03
WDP	m^3 global equivalent removed	8.1E+00	2.01E-02	-8.88E-01	2.59E-02	0	1.46E-02	3E-01	0	1.19E+02

GWP = Global Warming Potential; ODP = Ozone Depletion Potential; AP = Acidification Potential of Soil and Water; EP = Eutrophication Potential; POCP = Tropospheric Ozone Formation Potential; ADPE = Potential for the Depletion of Abiotic Resources – Non-fossil Resources (ADP – Substances); ADPF = Potential for the depletion of abiotic resources – fossil fuels (ADP – fossil energy sources); WDP = Water withdrawal potential (users)

LIFE CYCLE ASSESSMENT RESULTS – INDICATORS FOR DESCRIBING RESOURCE USE in accordance with EN 15804+A2: 1 m³ of chipboard and OSB

Indicator	Unit	A1	A2	A3	A5	C1	C2	C3	C4	D
PERE	MJ	6.03E+02	2.16E+00	3.42E+03	3.23E+00	0	1.08E+00	1.39E+02	0	1.01E+02
PERM	MJ	9.83E+03	0	3.21E+00	-3.21E+00	0	0	-9.83E+03	0	0
PERT	MJ	1.04E+04	2.16E+00	3.43E+03	1.59E-02	0	1.08E+00	-9.69E+03	0	1.01E+02
PENRE	MJ	2.54E+03	2.26E+01	9.44E+01	2.22E+00	0	1.28E+01	1.3E+02	0	-2.94E+03
PENRM	MJ	1.09E+03	0	2.16E+00	-2.16E+00	0	0	-1.09E+03	0	0
PENRT	MJ	3.62E+03	2.26E+01	9.66E+01	5.75E-02	0	1.28E+01	-9.6E+02	0	-2.94E+03
SM	kg	0	0	0	0	0	0	0	0	0
RSF	MJ	5.63E+02	0	1.1E+03	0	0	0	0	0	9.83E+03
NRSF	MJ	0	0	0	0	0	0	0	0	1.09E+03
FW	m^3	5.33E-01	2.23E-03	-1.64E-02	6.08E-04	0	1.21E-03	4.39E-02	0	2.8E+00

PERE = Renewable primary energy as an energy source; PERM = Renewable primary energy for material use; PERT = Total renewable primary energy; PENRE = Non-renewable primary energy as an energy source; PENRM = Non-renewable primary energy for material use; PENRT = Total non-renewable primary energy; SM = Use of secondary materials; RSF = Renewable secondary fuels; NRSF = Non-renewable secondary fuels; FW = Net use of freshwater resources

LIFE CYCLE ASSESSMENT RESULTS – WASTE CATEGORIES AND OUTPUT FLOWS in accordance with EN 15804+A2: 1 m³ of chipboard and ESB board

Indicator	Unit	A1	A2	A3	A5	C1	C2	C3	C4	D
HWD	kg	6.71E-03	3.21E-05	2.06E-03	2.52E-06	0	1.65E-05	1.24E-02	0	9.19E-03
NHWD	kg	1.03E+00	3.65E-03	1.74E+00	5.04E-03	0	1.99E-03	1.31E-01	0	2.48E+01
RWD	kg	2.32E-05	8.87E-10	9.4E-07	3.35E-11	0	4.13E-10	3.2E-07	0	1.76E-07
CRU	kg	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	0	0
MER	kg	0	0	9.93E-01	2.4E-01	0	0	6.31E+02	0	0
EEE	MJ	0	0	0	1.5E+00	0	0	0	0	0

EET	MJ	0	0	0	2.04E+00	0	0	0	0	0

HWD = Hazardous waste sent to landfill; NHWD = Disposed non-hazardous waste; RWD = Disposed radioactive waste; CRU = Components for reuse; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy – electrical; EET = Exported energy – thermal

LIFE CYCLE ASSESSMENT RESULTS – additional impact categories according to EN 15804+A2 (optional): 1 m³ chipboard and ESB board

Indicator	Unit	A1	A2	A3	A5	C1	C2	C3	C4	D
PM	Cases of illness	2.83E-06	4.48E-08	8.94E-06	2.8E-10	0	3.73E-08	1.14E-07	0	5E-07
IR	kBq U235 equivalent	1.1E+00	3.96E-03	1.89E-01	3.8E-04	0	2.31E-03	1.32E+00	0	9.61E-01
ETP-fw	CTUe	4.98E+02	1.7E+01	9.4E+01	2.53E-02	0	9.4E+00	4.81E+01	0	6.76E+01
HTP-c	CTUh	2.3E-08	3.41E-10	9.61E-08	2.34E-12	0	1.89E-10	2.75E-09	0	-9.28E-09
HTP-nc	CTUh	8.42E-07	1.48E-08	1.22E-07	9.83E-11	0	8.4E-09	3.79E-08	0	-1.61E-06
SQP	SQP	8.42E+01	1.28E+01	3.89E+01	1.89E-02	0	6.32E+00	9.08E+01	0	9.83E+01

PM = Potential incidence of disease due to particulate matter emissions; IR = Potential effect of human exposure to U235; ETP-fw = Potential toxicity comparison unit for ecosystems; HTP-c = Potential toxicity comparison unit for humans (carcinogenic effect); HTP-nc = Potential Toxicity Comparison Unit for humans (non-carcinogenic effect); SQP = Potential Soil Quality Index

Limitation note 1 – applies to the indicator 'Potential effect due to human exposure to U-235': This effect category primarily addresses the potential impact of low-dose ionising radiation on human health within the nuclear fuel cycle. It does not take into account effects attributable to potential nuclear accidents and occupational exposure, nor to the disposal of radioactive waste in underground facilities. Potential ionising radiation from the ground, radon and certain building materials is also not measured by this indicator.

Limitation note 2 – applies to the indicators 'Potential for abiotic resource scarcity – non-fossil resources', 'Potential for abiotic resource scarcity – fossil fuels', 'Water withdrawal potential (users)', Potential Toxicity Comparison Unit for Ecosystems, Potential Toxicity Comparison Unit for Humans – carcinogenic effects, Potential Toxicity Comparison Unit for Humans – non-carcinogenic effects, Potential Soil Quality Index: The results of these environmental impact indicators must be applied with caution, as there is a high degree of uncertainty surrounding these results or because there is only limited experience with the indicators.

Appendix 1
Biogenic GWP: The reported 'biogenic GWP' indicator aggregates biogenic GHG emissions from upstream chains involving energy use (e.g. fuels containing bioethanol) and material-inherent biogenic GWP (wood). A clear distinction must be made between this reported indicator and GWP-biogenic (wood), which is attributable exclusively to wood as a raw material and represents an inherent carbon sink; see also Chapters 4 and 6.

Addendum 2
The GWP-luluc indicator was not declared, as its contribution – including all omissions – accounts for less than 5% of the total GWP across the declared modules A–C.
Furthermore, as part of the primary data collection, detailed information on the origin of raw materials was requested; according to this, in the case of the product in question, 100 per cent of the industrial timber and industrial waste wood used originates from Germany (the federal states of Rhineland-Palatinate, Saarland, Hesse and North Rhine-Westphalia). Waste wood, used as a secondary fuel, is sourced from Germany.
We can therefore only make a statement regarding the foreground system, and conclude that the use of the primary raw material does not result in deforestation. Furthermore, as part of international greenhouse gas reporting under the United Nations Framework Convention on Climate Change (*UNFCCC*) and *EU Regulation (EU) 2018/841*, the annual volume of timber harvested from existing forests in Germany is estimated, including the proportion of timber resulting from the land-use change 'deforestation' (*Federal Environment Agency 2023*). For the year 2022, the proportion of timber removals associated with deforestation stood at 1.86% nationwide. At the same time, it can be assumed that timber assortments associated with a change in land use type can hardly be utilised by wood-processing companies due to the irregular supply (unpredictable in terms of location, timing and therefore logistics), as they rely on a continuous supply of specific raw timber assortments of consistent quality and dimensions (in this case: industrial timber for the production of wood-based materials).
Addendum 3
Primary energy used in the material (PERM and PENRM) is regarded as an inherent property of the material in accordance with *EN 16485*. Consequently, it always leaves the product system with the material and is deducted as a negative value from the corresponding indicator. RSF and NRSF are to be understood as part of PERE and PENRE and are included therein.

6. LCA: Interpretation

The focus of the interpretation of results lies on the production phase (Modules A1 to A3), as this is based on specific information provided by the company. The interpretation is carried out using a dominance analysis of the environmental impacts (fossil GWP, ODP, AP, EPfw, POCP, ADPE, ADPF, WDP) and the renewable/non-renewable primary energy inputs (PERE, PENRE), as well as fresh water use (FW) and hazardous waste (HWD). The most significant factors for each category are therefore listed below.

The analysis of the product's environmental impacts shows that different phases and materials represent different drivers of environmental impacts throughout the life cycle. The environmental impacts are essentially determined by three main areas – adhesive systems, thermal energy and electricity.

Interpretation of the individual indicators

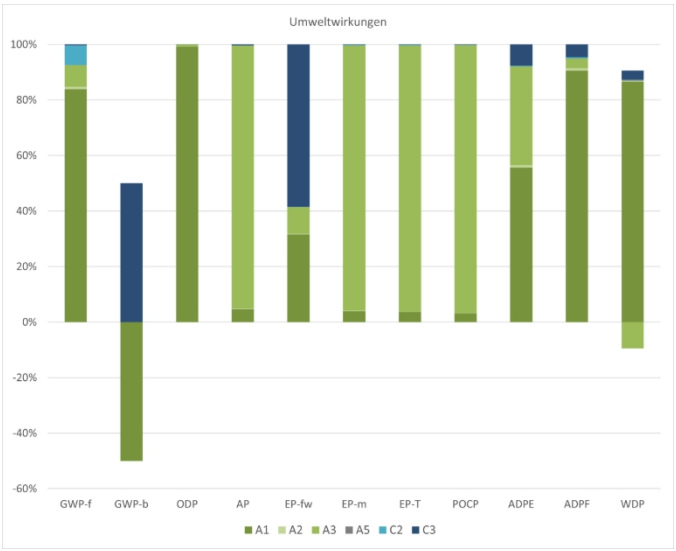


Fig. 2: Environmental dominance analysis, relative contributions of the modules under consideration to the most significant environmental impacts.

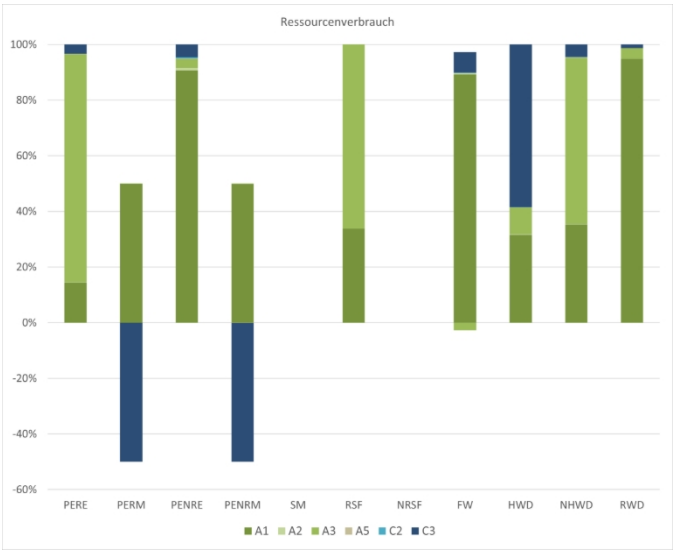


Fig. 3: Resource dominance analysis, relative contributions of the modules under consideration to the most important resource indicators

6.1 Global Warming Potential (GWP)

Biogenic GWP (GWP-b): When considering GWP, the $_{CO_2}$inputs and outputs inherent to the wood product system deserve special attention. The following table shows how GWP-biogenic (Total) is composed of the GWP-biogenic (M) component for material use (material-inherent emissions) plus GWP-biogenic (E) from energy use (upstream processes).

Parameter	Einheit	A1	A2	A3	A1-A3	A5	C1	C2	C3	C4	A-C
a. (GWP-b) nur Holz, materialinhärente Eigenschaft	[kg CO_2-Äqv.]	-9,36E+02	0,00E+00	-3,15E-01	**-9,36E+02**	3,27E-01	0,00E+00	0,00E+00	9,36E+02	0,00E+00	**1,13E-02**
b. (GWP-b) Sphera	[kg CO_2-Äqv.]	2,24E-01	7,41E-03	3,61E-02	**2,67E-01**	1,58E-05	0,00E+00	2,74E-03	1,34E-01	2,79E-03	**4,07E-01**
Summe a.+b. (GWP-b)	[kg CO_2-Äqv.]	-9,35E+02	7,41E-03	-2,79E-01	**-9,36E+02**	3,27E-01	0,00E+00	2,74E-03	9,36E+02	2,79E-03	**4,18E-01**

Fig. 4: Biogenic GWP (Total) comprising biogenic GWP (M) used for material purposes and biogenic GWP biogenic (E).

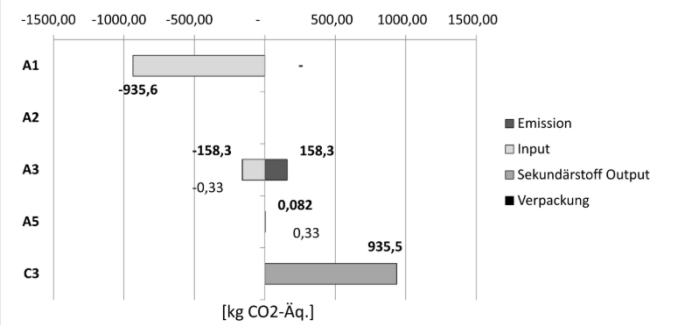


Figure 5: $_{CO_2}$inputs and outputs inherent to the wood product system. The inverse sign assignment for inputs and outputs takes account of the life cycle assessment approach to$_{CO_2}$flows from the perspective of the atmosphere.

The growth of the wood required for production sequesters 935.6 kg $_{of\ CO_2}$ in Module A1; see Fig. 3.
The growth of the wood used for energy in production also sequesters 158.3 kg $_{of\ CO_2}$, which is included in Module A3 and is subsequently re-emitted in this module as a result of combustion on-site. Module A3 also incorporates the biogenic $_{CO_2}$ contained in wood and paper packaging, amounting to 0.33 kg. This leaves the system boundary when the packaging is disposed of in Module A5. The remaining 935.5 kg $_{of\ CO_2}$leave the product system in Module C3 in the form of recoverable waste wood.

Fossil GWP (GWP-f): The contributing factors affecting the Global Warming Potential – Fossil (GWP-f) [kg CO_2 eq.] are as follows: 53% – MUF-specific adhesive (A1); 26.2% – UF-specific adhesive (A1); 5.5% – water-repellent treatment (A1); 3.9% – heat drying (A3); 3.3% – heat pre-forming (A3); 1.6% – formaldehyde scavenger (A1); remainder 6.6%.

6.2 Further indicators and their main sources

Ozone Depletion Potential (ODP) [kg CFC-11 equivalent]: 57.4% – MUF-specific adhesive (A1); 41.8% – UF-specific adhesive (A1); 0.5% – electricity for primary shaping (A3); 0.1% – electricity for final finishing (A3); 0.1% – electricity for drying (A3); 0% – electricity for longitudinal gluing process (A3); remainder 0%.

Acidification potential (AP) [mol H^+-eq.]: 51.4% – heat from drying (A3); 43.5% – heat from pre-forming (A3); 2.1% – MUF-specific adhesive (A1); 1.3% – UF-specific adhesive (A1); 0.4% – water-repellent treatment (A1); 0.4% – diesel (A1); remainder 0.9%.

Eutrophication, freshwater (EP-fw) [kg P-eq.]: 52.2% – MUF-specific adhesive (A1); 10.4% – heat drying (A3); 8.8% – heat moulding (A3); 8.4% – water-repellent treatment (A1); 5.4% – formaldehyde scavenger (A1); 4.7% – UF-specific adhesive (A1); remainder 10.2%.

Photochemical Ozone Formation (POCP) [kg NMVOC-eq.]: 51% – heat drying (A3); 43.2% – thermal pre-forming (A3); 2.3% – on-site dryer emissions (A3); 1.3% – MUF-specific adhesive (A1); 0.7% – UF-specific adhesive (A1); 0.4% – diesel (A1); remainder 1.1%.

Potential for abiotic degradation of non-fossil resources (ADPE) [kg Sb-eq.]: 29.5% – MUF-specific adhesive (A1); 23.5% – electricity for primary shaping (A3); 19.8% – UF-specific adhesive (A1); 6.1% – electricity for final finishing (A3); 4.8% – water-repellent treatment (A1); 4.5% – electricity for drying (A3); remainder 11.9%.

Potential for abiotic degradation of fossil fuels (ADPF) [MJ]: 51% – MUF-specific adhesive (A1); 30.7% – UF-specific adhesive (A1); 9.9% – water-repellent treatment (A1); 1.7% – formaldehyde scavenger (A1); 1.7% – heat for drying (A3); 1.4% – heat for primary moulding (A3); remainder 3.6%.

Water use (WDP) [m³ global equivalent withdrawn]: 25.7% – MUF-specific adhesive (A1); 6.4% – UF-specific adhesive (A1); 8.2% – operating materials (A1); -2.3% – electricity for primary shaping (A3); -2.9% – water-repellent treatment (A1); -2.6% – electricity for final finishing (A3); remainder 67.6%.

Renewable primary energy as an energy source (PERE) [MJ]: 35% – heat for drying (A3); 29.7% – heat for primary shaping (A3); 21.2% – electricity for primary shaping (A3); 5.5% – electricity for finishing (A3); 4% – electricity for drying (A3); 1.9% – electricity for the longitudinal gluing process (A3); remainder 2.7%.

Non-renewable primary energy as an energy source (PENRE) [MJ]: 51% – MUF-specific adhesive (A1); 30.7% – UF-specific adhesive (A1); 9.9% – water-repellent treatment (A1); 1.7% – formaldehyde scavenger (A1); 1.7% – heat drying (A3); 1.4% – heat for initial shaping (A3); remainder 3.6%.

Use of fresh water resources (FW) [m³]: 54% – MUF-specific adhesive (A1); 39.1% – UF-specific adhesive (A1); 5.6% – operating materials (A1); 1.1% – water-repellent treatment (A1); 0.3% – formaldehyde scavenger (A1); 0.9% – electricity for primary moulding (A3); remainder – 1%.

The dominant driver across many impact categories is the use of MUF and UF adhesives in the upstream supply chain (A1). These primarily determine the climate-related and resource-related indicators such as GWP-f, ADPF and PENRE, to which they collectively contribute well over 70–80 per cent.
They are also virtually the sole determining factor for ODP and water consumption (FW).
A second driver of environmental impacts is thermal energy in production (A3), particularly for drying and primary moulding. This dominates the traditional air-emission-driven categories such as acidification (AP) and photochemical ozone creation (POCP), each accounting for over 90 per cent. Heat supply is also the key driver for PERE and hazardous waste. This primarily reflects combustion processes and their emissions. Electricity plays a subordinate role overall, but is relevant in specific instances. It is particularly notable in the case of ADPE, where electricity-based processes account for a significant share, whilst its influence on GWP-f or other impact categories remains comparatively low.

Correlations and patterns can be identified between the results of the impact assessment across the various impact categories. Clear, process-driven correlations are evident between the indicators. The fossil-fuel-dominated categories, such as GWP-f, ADPF and PENRE, follow an almost parallel trajectory, as they are heavily dominated by the same sources, in particular MUF and UF adhesives. Changes in these upstream chains therefore consistently affect all three indicators. A second, closely linked cluster is formed by AP and POCP, which are almost entirely determined by the thermal energy used in drying and primary moulding. These two indicators therefore respond very similarly to changes in fuel consumption or in the emission profile of combustion plants.

There is some overlap between GWP-f and EP-fw, as adhesive systems also play a central role here; however, EP-fw is additionally influenced more strongly by individual additives and is therefore somewhat more widely varied.
ADPE shows a certain degree of decoupling from the other indicators, as, in addition to adhesives, electricity-related processes are particularly relevant here, resulting in a distinct profile. Accordingly, this indicator is more sensitive to changes in the electricity mix than most other impact categories.
The water-related indicators (WDP, FW), on the other hand, correlate strongly with one another and are primarily shaped by the upstream stages of the adhesives, whilst energy processes play a secondary role here. Overall, the correlations clearly reflect the underlying process groups: adhesives link the resource- and climate-related indicators, thermal energy links the air emissions-related categories, and electricity selectively influences individual resource-related impacts.

6.3 Hazardous waste

The relative volumes of hazardous, non-hazardous and radioactive waste per declared unit of the product are shown in Fig. 4 and are composed as follows.

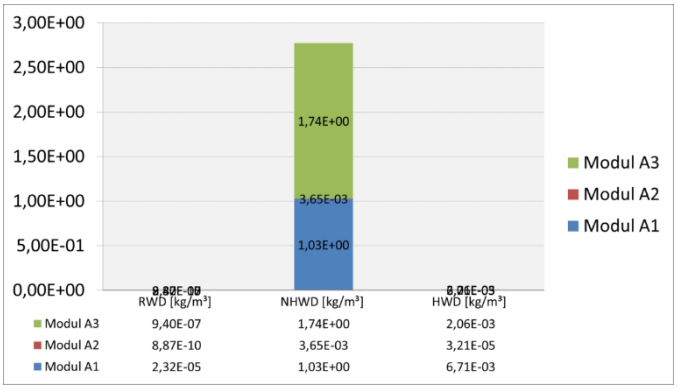


Fig. 4: Waste generation per declared unit at module level. HWD = Hazardous waste sent to landfill; NHWD = Disposed non-hazardous waste; RWD = Disposed radioactive waste.

The relevant and verifiable waste is attributable to Modules A1 and A3. This is because all production residues are either fed back into the production cycle or incinerated in the plant's own combustion plant to provide process heat in A3. The main drivers for hazardous waste for landfill (HWD) [kg] are: 40.4% – heat from drying (A3); 34.2% – heat from primary moulding (A3); 10.2% – MUF-specific adhesive (A1); 7.4% – UF-specific adhesive (A1); 2.7% – forestry (A1); 1.4% – SNP recycled (A1); remainder 3.7%. The variance in the LCIA results was not investigated, as the product is manufactured at a single site.

The quality of the results can be assessed as robust and good, as the correlations and significant influences are plausible and largely correspond to the observations from the life cycle inventory.

7. Evidence

Formaldehyde and VOC data are provided below

7.1 Formaldehyde

Monitoring: WKI Fraunhofer Institute Braunschweig (Qualitätsgemeinschaft Holzwerkstoffe e.V.)
Testing body: WKI Fraunhofer Institute Braunschweig Test standard: *DIN EN 717-1* Determination of formaldehyde release *DIN EN 16516* Assessment of the release of hazardous substances – determination of emissions into indoor air

No current use of MDI No waste wood is used in the manufacture of our chipboard and esb boards; consequently, there is no heavy metal contamination.
Testing body: ECO-Institut

Purpose of the test: Determination of VOC emissions in accordance with *the AgBB scheme* / MVVTB Test method: *DIN EN 16516 2020-10*

Result: The raw chipboard panels tested in accordance with *DIN EN 16516* meet the requirements of the AgBB scheme / MVVTB of 2018 for VOCs after 3 days and after 28 days.

esb Plus boards bear the RAL Blue Angel quality mark *(UZ-76)*.

AgBB results overview (28 days [µg/m³])
Detailed measurement data for all products can be provided on request.

Product name	Value	Unit
TVOC (C6 – C16)	260	µg/m³
Total SVOC (C16–C22)	<5	µg/m³
VOC excluding NIK	<5	µg/m³
Carcinogens	<1	µg/m³

AgBB results overview (3 days [µg/m³])
Detailed measurement data for all products can be provided on request.

Product name	Value	Unit
TVOC (C6 – C16)	170	µg/m³
Total SVOC (C16–C22)	<5	µg/m³
VOC excluding NIK	<5	µg/m³
Carcinogens	<1	µg/m³

8. References

DIN EN 310:1993-08
Wood-based materials; Determination of the modulus of elasticity in bending and the bending strength; German version of EN 310:1993

DIN EN 311:2002-08
Wood-based materials – Surface peel strength – Test method; German version of EN 311:2002

DIN EN 312:2010-12
Particleboard – Requirements; German version of EN 312:2010 DIN EN 317:1993-08 Particleboard and fibreboard; Determination of thickness swelling after immersion in water; German version of EN 317:1993

DIN EN 319:1993-08
Particleboard and fibreboard; determination of tensile strength perpendicular to the board plane; German version of EN 319:1993

DIN EN 322:1993-08
Wood-based materials; Determination of moisture content; German version of EN 322:1993

DIN EN 323:1993-08
Wood-based materials; Determination of bulk density; German version of EN 323:1993 DIN EN 324-1:1993-08 Wood-based materials; Determination of panel dimensions; Part 1:
Determination of thickness, width and length; German version of EN 324-1:1993

DIN EN 324-2:1993-08
Wood-based materials; Determination of panel dimensions; Part 2: Determination of squareness and edge straightness; German version of EN 3242:1993

DIN EN 717-1:2005-01
Wood-based materials – Determination of formaldehyde emission – Part 1: Formaldehyde emission using the test chamber method; German version of EN 7171:2004

DIN EN 1087-1:1995-04
Particleboard – Determination of moisture resistance – Part 1: boiling test
; German version of EN 10871:1995

DIN E 13501-1:2019-0
Classification of construction products and construction types according to their reaction to fire – Part 1: Classification based on the results of fire performance tests on construction products; German version of EN 13501-1:2018

DIN EN 13986:2015-06
Wood-based materials for use in construction – Properties, assessment of conformity and marking; German version of EN 13986:2004+A1:2015

DIN EN 15804+A2:2022-11
Sustainability of construction works – Environmental product declarations – Basic rules for the product category 'construction products'; German version of EN 15804:2012+A2:2019 + AC:2021

DIN ISO 16000-3:2023-12
Indoor air pollutants — Part 3: Measurement of formaldehyde and other carbonyl compounds in indoor air and in test chambers — Sampling using a pump (ISO 16000-3:2022)

DIN ISO 16000-6:2022-03
Indoor air pollutants — Part 6: Determination of organic compounds (VVOC, VOC, SVOC) in indoor and test chamber air by active sampling on adsorption tubes, thermal desorption and gas chromatography with MS or MSFID (ISO 16000-6:2021)

DIN EN ISO 16000-9:2008-04
Indoor air pollutants — Part 9: Determination of emissions of volatile organic compounds from construction products and furnishings — Emission test chamber method (ISO 16000-9:2006); German version of EN ISO 16000-9:2006

DIN EN 16516:2020-10
Construction products: Assessment of the release of hazardous substances – Determination of emissions into indoor air; German version of EN 16516:2017+A1:2020

ISO 50001:2018-08
Energy management systems — Requirements with guidance on use

AgBB scheme
Procedure for the health assessment of emissions of volatile organic compounds (VVOCs, VOCs and SVOCs) from construction products; Committee on the Health Assessment of Construction Products. 2021 edition.

AltholzV
Regulation on requirements for the recovery and disposal of waste wood 'Waste Wood Regulation' (AltholzV).

BNB/BBSR Table
BBSR table on the service lives of building components for life cycle assessments in accordance with the Sustainable Building Assessment System (BNB), Federal Ministry of the Interior, Building and Community, as at 24 February 2017.

CPR
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 (EU Construction Products Regulation).

ChemVerbotsV
Chemicals Prohibition Ordinance (ChemVerbotsV): Ordinance on prohibitions and restrictions on the placing on the market and the supply of certain substances, mixtures and articles pursuant to the Chemicals Act.

ECHA Candidate List
List of substances of very high concern eligible for authorisation (as at 27 June 2018) in accordance with Article 59(10) of the *REACH Regulation*. European Chemicals Agency.

IPCC (2006)
IPCC Guidelines for Greenhouse Gas Inventories, Volume 4 Agriculture, Forestry and Other Land Use. Hayama, Kanagawa, Japan: IEA/OECD, IPCC National Greenhouse Gas Inventories Programme, Technical Support Unit, 683 pp.

PCR Part A
Product Category Rules for building-related products and services. Part A: Calculation rules for life cycle assessment and requirements for the project report. Version 1.4. Berlin: Institut Bauen und Umwelt e.V. (publisher), 30 April 2024.

PCR Part B
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