SENTINEL HOLDING
INSTITUT

SHI PRODUCT PASSPORT

Find products. Certify buildings.

SHI Product Passport No.:

15171-10-1003

JACKODUR LIGNIN

Product group: Roof and facade - Insulation

JACKON Insulation GmbH
Ritzlebener Str. 1
39619 Arendsee OT Mechau

Product qualities:

- SHI Product Assessment 2024
- QNG Qualitätssiegel Nachhaltiges Gebäude
- DGNB NEW CONSTRUCTION 2023.2
- DGNB NEW CONSTRUCTION 2023
- DGNB NEW CONSTRUCTION 2018
- BNB-BN NEUBAU V2015
- EU TAXONOMY
- BREEAM DE NEUBAU 2018
- LEED v4.1 (outside US)

CERTIFIED SUSTAINABLE PRODUCT
SHI PRODUCT PASSPORT
SENTINEL HOLDING INSTITUT
www.sentinel-holding.eu

Köttner

Helmut Köttner
Scientific Director
Freiburg, 26 August 2026

SENTINEL HOLDING
INSTITUT

Product:
JACKODUR LIGNIN

SHI Product Passport no.:
15171-10-1003

JACKON by BEWI

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The SHI Database is the first and only database for construction products whose comprehensive processes and data accuracy are regularly verified by the independent auditing company SGS-TÜV Saar

SGS TÜV SAAR

SENTINEL HOLDING
INSTITUT

Product:
JACKODUR LIGNIN

SHI Product Passport no.:
15171-10-1003

JACKON by BEWI

SHI Product Assessment 2024

Since 2008, Sentinel Holding Institut GmbH (SHI) has been establishing a unique standard for products that support healthy indoor air. Experts carry out independent product assessments based on clear and transparent criteria. In addition, the independent testing company SGS regularly audits the processes and data accuracy.

Criteria	Product category	Harmful substance limit	Assessment
SHI Product Assessment	Insulation materials	TVOC ≤ 300 µg/m³ Formaldehyd ≤ 24 µg/m³	Indoor Air Quality Certified
Valid untill: 05 June 2028			

SENTINEL HOLDING
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Product:
JACKODUR LIGNIN

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15171-10-1003

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QNG - Qualitätssiegel Nachhaltiges Gebäude

The Qualitätssiegel Nachhaltiges Gebäude (Quality Seal for Sustainable Buildings), developed by the German Federal Ministry for Housing, Urban Development and Building (BMWSB), defines requirements for the ecological, socio-cultural, and economic quality of buildings. The Sentinel Holding Institut evaluates construction products in accordance with QNG requirements for certification and awards the QNG ready label. Compliance with the QNG standard is a prerequisite for eligibility for the KfW funding programme. For certain product groups, the QNG currently has no specific requirements defined. Although classified as not assessment-relevant, these products remain suitable for QNG-certified projects.

Criteria	Pos. / product group	Considered substances	QNG assessment
3.1.3 Schadstoffvermeidung in Baumaterialien	12.1 Rigid plastic foam insulation boards and spray foams	Halogenated propellants / SVHC: HBCD, TCEP / emissions	QNG ready
Verification: Herstellererklärung 11.05.26			

SENTINEL HOLDING
INSTITUT

Product:
JACKODUR LIGNIN

SHI Product Passport no.:
15171-10-1003

JACKON by BEWI

DGNB New Construction 2023.2

Außenanwendung

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact	40 Dämmplatten aus Kunststoffschäumen (innen und außen)	Gehalt an gefährlichen Stoffen: TCEP (SVHC), Halogenierte Treibmittel	Quality level 4
Verification: Herstellererklärung 11.05.26			

Innenanwendung

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact			Not relevant for assessment
Verification: Nur XPS-Dämmplatten an der Gebäudehülle außen sind bewertungsrelevant.			

SENTINEL HOLDING
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Product:
JACKODUR LIGNIN

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15171-10-1003

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DGNB New Construction 2023

The DGNB System (German Sustainable Building Council) assesses the sustainability of various types of buildings. It can be applied to both large-scale private and commercial projects as well as smaller residential buildings. The 2023 version sets high standards for ecological, economic, socio-cultural, and functional aspects throughout the entire life cycle of a building.

Außenanwendung

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact, 03.05.2024 (3rd edition)	40 Synthetic foam insulation for buildings and building services	Halogenated propellants	Quality level 4
Verification: Herstellererklärung 11.05.26			

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact, 29.05.2025 (4th edition)	40 Synthetic foam insulation for buildings	Halogenated propellants / SVHC: HBCD, TCEP / emissions	Quality level 4
Verification: Herstellererklärung 11.05.26			

Innenanwendung

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact, 03.05.2024 (3rd edition)	not applicable		Not relevant for assessment
Verification: Nur XPS-Dämmplatten an der Gebäudehülle außen sind bewertungsrelevant.			

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact, 29.05.2025 (4th edition)	not applicable		Not relevant for assessment
Verification: Nur XPS-Dämmplatten an der Gebäudehülle außen sind bewertungsrelevant.			

Criteria	Assessment
ENV1.1 Climate action and energy (*)	May positively contribute to the overall building score
Verification: Es liegt eine EPD vor. - Eine effizientere Energienutzung im Gebäude wird durch den Wärmedämmstoff hervorgerufen. - Das Produkt besteht aus recyceltem (CO2-reduzierten) PS und Biopolymer	

Criteria	Assessment
ECO1.1 Life cycle cost (*)	May positively contribute to the overall building score
Verification: Das Produkt trägt durch die Reduktion der Energiekosten zur Senkung der Lebenszykluskosten bei.	

Criteria	Assessment
ECO2.6 Climate resilience (*)	May positively contribute to the overall building score
Verification: Das Produkt ist ein Wärmedämmstoff und trägt damit zum Kühl- oder Hitzeschutz des Gebäude bei.	

Criteria	Assessment
SOC1.1 Thermal comfort (*)	May positively contribute to the overall building score
Verification: Das Produkt ist eine Wärmedämmstoff und kann damit die Innenraumtemperatur mit regulieren.	

Criteria	Assessment
SOC1.2 Indoor air quality (*)	May positively contribute to the overall building score
Verification: Das Produkt entspricht dem AgBB Schema	

Criteria	Assessment
TEC1.3 Quality of the building envelope (*)	May positively contribute to the overall building score
Verification: Das Wärmedämmprodukt minimiert den Wärme-/Kältedurchgang an der Gebäudehülle.	

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Product:
JACKODUR LIGNIN

SHI Product Passport no.:
15171-10-1003

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DGNB New Construction 2018

The DGNB System (German Sustainable Building Council) assesses the sustainability of various types of buildings. It can be applied to both large-scale private and commercial projects as well as smaller residential buildings.

Außenanwendung

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact	40 Synthetic insulating materials for buildings and building services	Halogenated propellants	Quality level 4
Verification: Herstellererklärung 11.05.26			

Innenanwendung

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact	not applicable	not applicable	Not relevant for assessment

SENTINEL HOLDING
INSTITUT

Product:
JACKODUR LIGNIN

SHI Product Passport no.:
15171-10-1003

JACKON by BEWI

BNB-BN Neubau V2015

The Bewertungssystem Nachhaltiges Bauen (Assessment System for Sustainable Building) is a tool for evaluating public office and administrative buildings, educational facilities, laboratory buildings, and outdoor areas in Germany. The BNB was developed by the former Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and is now overseen by the Federal Ministry for Housing, Urban Development and Building (BMWSB).

Außenanwendung

Criteria	Pos. / product type	Considered substance group	Quality level
1.1.6 Risiken für die lokale Umwelt	36a Mineral and non-mineral external wall insulations (external wall paints see Position 6, plasters see Position 35)	Biocides / hazardous substances / halogenated blowing agents	Quality level 3
Verification: Herstellererklärung 11.05.26			

Innenanwendung

Criteria	Pos. / product type	Considered substance group	Quality level
1.1.6 Risiken für die lokale Umwelt	36b Mineral and non-mineral interior insulations	VOC / biocides / hazardous substances / individual hazardous substances (formaldehyde) / halogenated blowing agents	Quality level 4
Verification: Herstellererklärung 11.05.26, Prüfbericht-Nr.: DE22EIXI 001			

SENTINEL HOLDING
INSTITUT

Product:
JACKODUR LIGNIN

SHI Product Passport no.:
15171-10-1003

JACKON by BEWI

EU taxonomy

The EU Taxonomy classifies economic activities and products according to their environmental impact. At the product level, the EU regulation defines clear requirements for harmful substances, formaldehyde and volatile organic compounds (VOCs). The Sentinel Holding Institut GmbH labels qualified products that meet this standard.

Außenanwendung

Criteria	Product type	Considered substances	Assessment
DNSH - Pollution prevention and control	Sonstige	Stoffe nach Anlage C	compliant

Verification: Herstellererklärung 11.05.26

Innenanwendung

Criteria	Product type	Considered substances	Assessment
DNSH - Pollution prevention and control	Internal insulation	Stoffe nach Anlage C, Formaldehyd, Karzinogene VOC Kategorie 1A/1B	compliant

Verification: Herstellererklärung 11.05.26, Prüfbericht-Nr.: DE22EIXI 001

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JACKON by BEWI

BREEAM DE Neubau 2018

BREEAM (Building Research Establishment Environmental Assessment Methodology) is a UK-based building assessment system that evaluates the sustainability of new constructions, refurbishments, and conversions. Developed by the Building Research Establishment (BRE), the system aims to assess and improve the environmental, economic, and social performance of buildings.

Außenanwendung

Criteria	Product category	Considered substances	Quality level
Hea 02 Indoor Air Quality			Not relevant for assessment

Innenanwendung

Criteria	Product category	Considered substances	Quality level
Hea 02 Indoor Air Quality	Ceiling, wall, and acoustic and thermal insulation materials	Emissions: Formaldehyde, TVOC, TSVOC, carcinogens	Exemplary quality
Verification: Prüfbericht-Nr.: DE22EIXI 001			

SENTINEL HOLDING
INSTITUT

Product:
JACKODUR LIGNIN

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15171-10-1003

JACKON by BEWI

LEED v4.1

LEED (Leadership in Energy and Environmental Design) is an internationally recognised building certification system developed by the U.S. Green Building Council. It is one of the most widely used sustainability standards for buildings worldwide and is particularly applied in internationally oriented projects. LEED assesses buildings holistically across categories such as energy efficiency, resource conservation, material selection, indoor environmental quality and site sustainability. Depending on the number of points achieved, projects are awarded one of the certification levels: LEED Certified, Silver, Gold or Platinum.

Außenanwendung

Criteria	Product category	Considered substances	Assessment
EQ Credit: Low-Emitting Materials			Not relevant for assessment

Innenanwendung

Criteria	Product category	Considered substances	Assessment
EQ Credit: Low-Emitting Materials	Dämmstoffe	Emissionen: Formaldehyd, VOC, Krebserregende Stoffe	compliant
Verification: Prüfbericht-Nr.: DE22EIXI 001			

SENTINEL HOLDING
INSTITUT

Product:
JACKODUR LIGNIN

SHI Product Passport no.:
15171-10-1003

JACKON by BEWI

Product labels

In the construction industry, high-quality materials are crucial for a building's indoor air quality and sustainability. Product labels and certificates offer guidance to meet these requirements. However, the evaluation criteria of these labels vary, and it is important to carefully assess them to ensure products align with the specific needs of a construction project.



This product is SHI Indoor Air Quality certified and recommended by Sentinel Holding Institut. Indoor-air-focused construction, renovation, and operation of buildings is made possible by transparent and verifiable criteria thanks to the Sentinel Holding concept.



Products bearing the Sentinel Holding Institute QNG-ready seal are suitable for projects aiming to achieve the "Qualitätssiegel Nachhaltiges Gebäude" (Quality Seal for Sustainable Buildings). QNG-ready products meet the requirements of QNG Appendix Document 3.1.3, "Avoidance of Harmful Substances in Building Materials." The KfW loan program Climate-Friendly New Construction with QNG may allow for additional funding.

epd-norge

EPD-Norge is the Norwegian program operator for Environmental Product Declarations (EPDs). The program follows ISO 14025 and EN 15804 and ensures that EPDs for construction and industrial products are published in a consistent, verified and comparable manner. Before publication, each EPD undergoes independent third-party verification; EPD-Norge provides clear procedures, Product Category Rules (PCR/NPCR) and a public register for this purpose.

Product:
JACKODUR LIGNIN

SHI Product Passport no.:
15171-10-1003

Legal notices

(*) These criteria apply to the construction project as a whole. While individual products can positively contribute to the overall building score through proper planning, the evaluation is always conducted at the building level. The information was provided entirely by the manufacturer.

Find our criteria here: https://www.sentinel-holding.eu/de/Themenwelten/Pr%C3%BCfkriterien%20f%C3%BCr%20Produkte

The SHI Database is the first and only database for construction products whose comprehensive processes and data accuracy are regularly verified by the independent auditing company SGS-TÜV Saar

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JACKODUR® LIGNIN 300 Standard



Innovative Wärmedämmung mit biobasiertem Lignin

Dämmstoff neu gedacht – mit der Kraft nachwachsender Rohstoffe.
JACKODUR® LIGNIN Dämmstoffe stehen für eine neue Generation nachhaltiger Bauprodukte. Durch die intelligente Nutzung nachwachsender Rohstoffe wie Lignin sowie ausgewählter Recyclingmaterialien leisten sie einen aktiven Beitrag zum Klima- und Umweltschutz.

Anwendungsbereiche

- **Wärmedämmung unter Estrich**
- **als Sockel und Kerndämmung**
- **Aufsparrendämmung**
- **Innendämmung**
- **Außendämmung der Wand hinter Bekleidung (Holzverschalung)**

Vorteile

- **mit biosbasierten Rohstoffen**
- **geringer CO_2-Fußabdruck**
- **Nennwert λ_D = 0,032 W/(m·K)**
- **zu 100 % werkstofflich recyclebar**



Art.-Nr.	EAN-Code	Dicke mm	Platten/Paket	m²/Paket	Platten/Paket
4530407	40 25345 18271 2	50	8	6,00	12
4530408	40 25345 18272 9	60	7	5,25	12
4530409	40 25345 18273 6	80	5	3,75	12
4530413	40 25345 18274 3	100	4	3,00	12
4530414	40 25345 18275 0	120	3	2,25	14
4530470	40 25345 18305 4	140	3	2,25	12
4530471	40 25345 18306 1	160	3	2,25	10
4530472	40 25345 18307 8	180	2	1,50	14
4530473	40 25345 18308 5	200	2	1,50	12

Technische Daten JACKODUR® LIGNIN 300 Standard

Eigenschaften	Angabe / Einheit	Norm	JACKODUR® LIGNIN 300 Standard								
Dicke	mm		50	60	80	100	120	140	160	180	200
Bemessungswert der Wärmeleitfähigkeit λ	W/(m·K)	DIN 4108-10	0,033								
Nennwert der Wärmeleitfähigkeit λ_D	W/(m·K)	EN 13164	0,032								
Wärmedurchlasswiderstand R_D	m²·K/W	EN 13164	1,55	1,95	2,50	3,10	3,75	4,35	5,00	5,60	6,25
Wasserdampfdiffusions-widerstandszahl μ		EN 12086	50 - 300								
Wasseraufnahme durch Diffusion, WD(V)	Vol.-%	EN 12088	≤ 4								
Druckspannung bei 10% Verformung oder Druckfestigkeit	kPa	EN 826	300								
Brandverhalten	Euro-klasse	EN 13501-1	E								
Wasseraufnahme bei lang-zeitigem Eintauchen, WL(T)	Vol.-%	EN 12087	≤ 3								
Widerstandsfähigkeit gegen Frost-Tau-Wechsel-beanspruchung, FTCD	Vol.-%	EN 12091	≤ 5								
Dimensionsänderung bei 70°C. und 90% rel. Feuchte, DS(70/90)	%	EN 1604	≤ 5								
Verformung bei 40 kPa Druck- und 70°C. Temperatur-beanspruchung, DLT(2)5	%	EN 1605	≤ 5								
Anwendungsgrenz-temperatur	°C		-50 bis +75								
Oberflächenbeschaffenheit			glatt								
Kantenausprägung			Stufenfalz								

***JACKODUR® LIGNIN** ist ein innovativer Biopolymer-Hartschaum, der ausschließlich aus biobasierten und recycelten Polystyrol besteht.*

Mit seinen hervorragenden Eigenschaften bietet JACKODUR® LIGNIN eine leistungsstarke Lösung für viele Anwendungen im Hochbau. Für den Einsatz als Perimeterdämmung, oder im Umkehrdach empfehlen wir jedoch unsere dafür zugelassenen JACKODUR® KF / EVO / Plus Alternativen.



100%
recycelbar

Wichtige Informationen für Ihre Planung finden Sie unter www.jackon-insulation.com

EPD verified
EPD nach ISO 14025 und EN 15804+A2

JACKODUR® FREI
HBCD FCKW HFCKW

Frei von HBCD Flammschutzmitteln sowie Fluorchlorkohlen-wasserstoffe (FCKW), HFCKW- und HFKW-haltigen Treibmitteln.

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D-33803 Steinhagen

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JACKON by BEWI

JACKODUR® und JACKOBOARD® sind eingetragene Warenzeichen der JACKON Insulation GmbH. Irrtümer und Änderungen vorbehalten. Art.-Nr. 0000000 DE DE/AT/CH 05/2026

epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

JACKODUR® LIGNIN



The Norwegian EPD Foundation

Owner of the declaration:
BEWI ASA, Insulation and Construction

Product:
JACKODUR® LIGNIN

Declared unit:
1 m3

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR.
NPCR 012:2022 Part B for Thermal insulation products

Program operator:
The Norwegian EPD Foundation

Declaration number:
NEPD-9802-9742

Registration number:
NEPD-9802-9742

Issue date:
22.04.2025

Valid to:
22.04.2030

EPD software:
LCAno EPD generator ID: 172376

General information

Product

JACKODUR® LIGNIN

Owner of the declaration:

BEWI ASA, Insulation and Construction
Contact person: Marc Storm Andersen
Phone: +45 72157902
e-mail: marc.andersen@bewi.com

Program operator:

The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
Phone: +47 977 22 020
web: www.epd-norge.no

Manufacturer:

BEWI Insulation Germany and Belgium

, Europe

Declaration number:

NEPD-9802-9742

Place of production:

JACKON Insulation GmbH
Ritzlebener Str.1
39619 Arendsee, Germany

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR.
NPCR 012:2022 Part B for Thermal insulation products

Management system:

ISO 14001 og 9001 for all production sites

Statement of liability:

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

Organisation no:

925437948

Declared unit:

1 m3 JACKODUR® LIGNIN

Issue date:

22.04.2025

Declared unit with option:

A1, A2, A3, A4, A5, C1, C2, C3, C4, D

Valid to:

22.04.2030

Year of study:

2024

Functional unit:

1 m^2 of JACKODUR® LIGNIN insulation material with a thickness (34 mm) provide a thermal resistance (R-value)=1 m^2K/W within an expected service life for insulation materials. Therefore the conversion factor for R=1 m^2K/W is f=0,029.

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804:2012+A2:2019 and seen in a building context.

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway. NEPDT97

Developer of EPD: Mark Plate

Reviewer of company-specific input data and EPD: Martin Bendix

Verification of EPD tool:

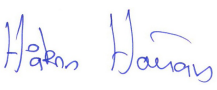
Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Elisabet Amat, GREENIZE projects

(no signature required)

Approved:



Håkon Hauan, CEO EPD-Norge

Product

Product description:

JACKODUR® LIGNIN is an extruded polymer foam (with lignin and rPS) produced on the basis EN 13164 and available in board shape with a density 36 kg/m3 in average (measured). Lignin is a biopolymer and is abundantly produced as a byproduct of the paper industry during the breakdown of cellulose. rPS is made from post-consumer waste.

Product specification

JACKODUR® LIGNIN has specifically low values of thermal conductivity. To meet the need of various applications the boards are produced with different surfaces: with the extrusion skin, planed, grooved or with thermal embossing. JACKODUR® LIGNIN boards are supplied with different edge treatments such as butt edge, ship-lap and tongue and groove. The EPD is related to an unlaminated product only; lamination and additional product treatment are not considered.

Materials	kg	%
Emissions and waste streams	25,20	66,098
Expansion gas	1,29	3,39
Fuels, fossil	0,61	1,60
Organic Polymer	10,80	28,32
Packaging - EPS	0,21	0,56
Total	38,12	100,00

Packaging	kg	%
Packaging - Plastic	0,43	100,00
Total incl. packaging	38,56	100,00

Technical data:

Name	Value	Unit	Norm
Gross density	> 30	kg / m3	EN 1602
Compressive strength (thickness > 30 mm)	0.3	N/mm2	EN 826
Tensile strength	0,1 - 0,4	N/mm2	EN 1607
Dimensional stability at 70°C and 90% relative humidity	< 5	%	EN 1605
Deformation under 40 kPa load and 70°C	< 5	%	EN 1605
Thermal conductivity	0,034	W/(m·K)	EN 13164
Water vapour diffusion resistance factor	250-80		EN 12086

Market:

Europe

Reference service life, product

A reference service life (RSL) according to ISO 15686 cannot be declared. The durability of JACKODUR® LIGNIN is normally at least as long as the lifetime of the building in which it is used (more than 80 years).

Reference service life, building or construction works

LCA: Calculation rules

Declared unit:

1 m3 JACKODUR® LIGNIN

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

< 0,5%

Allocation:

The allocation is made in accordance with the provisions of EN 15804+A2. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

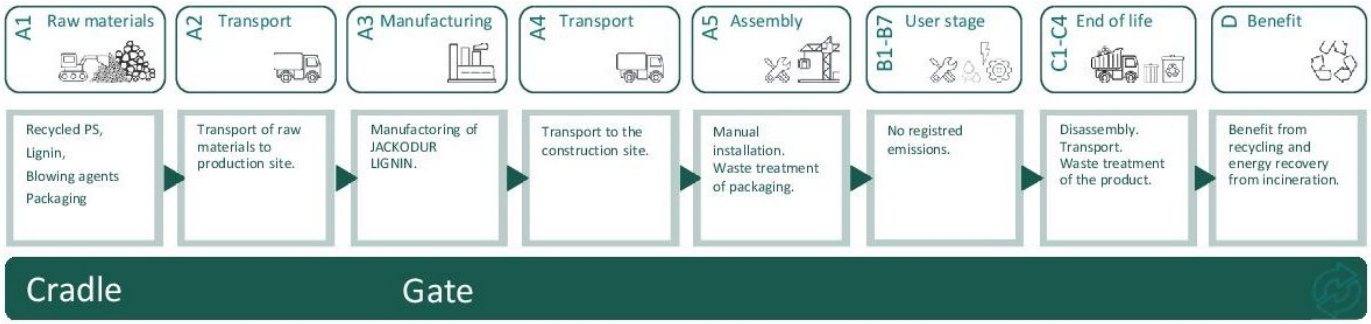
Materials	Source	Data quality	Year
Emissions and waste streams	LCA.no	Database	2024
Expansion gas	ecoinvent 3.6	Database	2019
Expansion gas	ecoinvent 3.6	Database	2020
Fuels, fossil	ecoinvent 3.6	Database	2019
Organic Polymer	Supplier	Supplier specific	2022
Packaging - EPS	Plastics Europe + ecoinvent 3.6	European average.	2019
Packaging - Plastic	ecoinvent 3.6	Database	2019

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	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	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:

Type of EPD: cradle-to-gate (A1 - A3) – with options
The following modules are considered in the Life Cycle Assessment:
- Raw material supply (A1),
- Transport to manufacturer (A2),
- Manufacturing (A3),
- Transport to construction site (A4)
- Deconstruction (C1) andTransport to EoL (C2),
- Wasteprocessing (C3) and Disposal (C4) with one scenarios (thermal treatment)
- Reuse, recovery or recycling potential (D)



Additional technical information:

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (kgkm)	36,7 %	500	0,043	l/tkm	21,50

Assembly (A5)	Unit	Value			
Waste, packaging, plastic to average treatment - A5 (inkl transport) (kg)	kg	0,65			

De-construction demolition (C1)	Unit	Value			
Waste treatment, PS, Insulation, Germany (kg)	kg/DU	36,00			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 6 (kgkm)	53,3 %	50	0,023	l/tkm	1,15

Waste processing (C3)	Unit	Value			
Waste, Polystyrene, incineration	kg	32,40			
Recycling of PS	kg	3,60			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of PS	kg	0,097			
Waste, inert waste, to landfill (kg)	kg	0,00			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
substitution of electricity (MJ)	MJ	18,79			
Substitution of thermal energy (MJ)	MJ	1034,59			
Substitution of expandable polystyrene, EPS, granulate (kg)	kg	3,60			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact												
	Indicator	**Unit**	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	-6,95E+00	2,45E+00	1,58E+00	3,15E+00	5,16E-02	0,00E+00	1,68E-01	1,03E+02	5,04E-03	-1,94E+01
	GWP-fossil	kg CO_2 -eq	6,07E+00	2,45E+00	1,57E+00	3,15E+00	5,16E-02	0,00E+00	1,68E-01	1,03E+02	5,03E-03	-1,91E+01
	GWP-biogenic	kg CO_2 -eq	-1,30E+01	1,01E-03	4,64E-03	1,30E-03	7,12E-06	0,00E+00	7,19E-05	7,12E-04	2,67E-06	-9,23E-02
	GWP-luluc	kg CO_2 -eq	2,67E-02	8,70E-04	1,70E-03	1,12E-03	3,95E-06	0,00E+00	5,12E-05	1,13E-04	7,72E-07	-2,05E-01
	ODP	kg CFC11 -eq	1,01E-06	5,54E-07	1,20E-07	7,13E-07	3,10E-09	0,00E+00	4,05E-08	7,41E-08	5,40E-10	-4,37E-01
	AP	mol H+ -eq	7,06E-02	7,03E-03	1,05E-02	9,05E-03	6,36E-05	0,00E+00	5,41E-04	1,23E-02	1,77E-05	-9,32E-02
	EP-FreshWater	kg P -eq	2,65E-04	1,95E-05	9,23E-05	2,52E-05	1,06E-07	0,00E+00	1,34E-06	7,31E-06	6,80E-08	-7,45E-04
	EP-Marine	kg N -eq	1,19E-02	1,39E-03	1,68E-03	1,79E-03	5,81E-05	0,00E+00	1,18E-04	5,91E-03	5,53E-06	-2,29E-02
	EP-Terrestial	mol N -eq	1,31E-01	1,56E-02	1,83E-02	2,00E-02	2,28E-04	0,00E+00	1,32E-03	6,32E-02	6,29E-05	-2,46E-01
	POCP	kg NMVOC -eq	4,51E-02	5,96E-03	6,37E-03	7,67E-03	7,49E-05	0,00E+00	5,19E-04	1,52E-02	1,74E-05	-8,76E-02
	ADP-minerals&metals[1]	kg Sb-eq	8,54E-05	6,75E-05	1,80E-04	8,70E-05	2,74E-07	0,00E+00	2,99E-06	3,19E-06	2,82E-08	-3,80E-05
	ADP-fossil[1]	MJ	1,55E+02	3,70E+01	1,72E+01	4,76E+01	2,13E-01	0,00E+00	2,73E+00	6,33E+00	4,58E-02	-3,80E+02
	WDP[1]	m^3	6,72E+02	3,58E+01	4,27E+01	4,61E+01	7,52E-01	0,00E+00	2,09E+00	1,40E+01	4,74E-01	-3,07E+02

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment: EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Remarks to environmental impacts

Additional environmental impact indicators

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	3,30E-07	1,50E-07	1,03E-07	1,93E-07	1,14E-09	0,00E+00	1,54E-08	5,17E-08	2,20E-10	-3,41E-06
	IRP[2]	kgBq U235 -eq	4,24E-01	1,62E-01	4,99E-02	2,08E-01	9,61E-04	0,00E+00	1,19E-02	1,06E-02	2,17E-04	-4,69E-01
	ETP-fw[1]	CTUe	1,64E+02	2,74E+01	7,15E+01	3,53E+01	2,03E-01	0,00E+00	1,99E+00	1,53E+01	8,42E-02	-4,99E+02
	HTP-c[1]	CTUh	2,44E-09	0,00E+00	5,01E-09	0,00E+00	5,00E-12	0,00E+00	0,00E+00	4,34E-09	4,00E-12	-1,03E-08
	HTP-nc[1]	CTUh	8,10E-08	2,99E-08	9,52E-08	3,86E-08	1,92E-10	0,00E+00	1,93E-09	1,72E-07	1,55E-10	-4,50E-07
	SQP[1]	dimensionless	5,14E+02	2,59E+01	3,70E+01	3,33E+01	3,71E-01	0,00E+00	3,13E+00	7,54E-01	1,26E-01	-5,72E+02

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator
2. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Resource use												
Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	4,36E+01	5,29E-01	1,90E+02	6,82E-01	5,37E-03	0,00E+00	3,43E-02	1,82E-01	2,67E-03	-4,74E+02
	PERM	MJ	1,42E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,42E+02	0,00E+00	0,00E+00
	PERT	MJ	1,85E+02	5,29E-01	1,90E+02	6,82E-01	5,37E-03	0,00E+00	3,43E-02	-1,41E+02	2,67E-03	-4,74E+02
	PENRE	MJ	1,30E+02	3,70E+01	1,72E+01	4,76E+01	2,13E-01	0,00E+00	2,73E+00	6,33E+00	4,58E-02	-3,80E+02
	PENRM	MJ	2,54E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PENRT	MJ	1,56E+02	3,70E+01	1,72E+01	4,76E+01	2,13E-01	0,00E+00	2,73E+00	6,33E+00	4,58E-02	-3,80E+02
	SM	kg	2,52E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	RSF	MJ	1,73E-01	1,89E-02	3,30E-02	2,44E-02	1,41E-04	0,00E+00	1,20E-03	5,08E-03	6,63E-05	-4,77E-02
	NRSF	MJ	7,69E-02	6,77E-02	1,75E-03	8,72E-02	3,69E-04	0,00E+00	4,02E-03	0,00E+00	1,06E-02	-3,13E+01
	FW	m^3	7,28E-02	3,95E-03	4,59E-02	5,09E-03	1,12E-04	0,00E+00	3,10E-04	1,79E-02	4,21E-05	-4,42E-01

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Waste

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	3,90E-02	1,91E-03	1,99E-02	2,46E-03	0,00E+00	0,00E+00	1,49E-04	0,00E+00	8,35E-02	-6,51E-03
	NHWD	kg	8,75E-01	1,80E+00	1,60E+00	2,32E+00	6,51E-01	0,00E+00	2,37E-01	0,00E+00	4,14E-02	-1,83E+00
	RWD	kg	3,71E-04	2,52E-04	4,98E-05	3,24E-04	0,00E+00	0,00E+00	1,86E-05	0,00E+00	2,76E-07	-4,11E-04

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Output flow

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	3,20E-03	0,00E+00	3,89E-01	0,00E+00	3,32E-01	0,00E+00	0,00E+00	3,60E+00	0,00E+00	0,00E+00
	MER	kg	3,16E-04	0,00E+00	9,07E-02	0,00E+00	3,26E-05	0,00E+00	0,00E+00	3,24E+01	0,00E+00	0,00E+00
	EEE	MJ	8,25E-04	0,00E+00	1,35E-01	0,00E+00	5,00E-05	0,00E+00	0,00E+00	5,71E+01	0,00E+00	0,00E+00
	EET	MJ	1,25E-02	0,00E+00	2,05E+00	0,00E+00	7,57E-04	0,00E+00	0,00E+00	8,64E+02	0,00E+00	0,00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	3,56E+00
Biogenic carbon content in accompanying packaging	kg C	0,00E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Source	Amount	Unit
Electricity, with Guarantee of origin, 01.01.2025 - 31.12.2025 - BEWI Arendsee, Germany (kWh)	ecoinvent 3.6	29,24	g CO2-eq/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list.

Indoor environment

JACKODUR® LIGNIN can be used indoor however they are generally not exposed to the indoor air but covered by a finishing element or system.
The VOC emission testing meets the requirements of the AgBB/DIBt method.
The tested products all comply with the requirements of DIBt and AgBB for the use in the indoor environment.
The tested products also all achieved the A+ rating of the French VOC labelling scheme.

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products											
Indicator	**Unit**	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	6,12E+00	2,45E+00	1,58E+00	3,15E+00	5,16E-02	0,00E+00	1,68E-01	1,03E+02	5,22E-03	-1,93E+01

GWP-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

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Herstellererklärung für das Produkt JACKODUR LIGNIN

Hiermit bestätigen wir, dass bei den extrudierten Polystyrolhartschaumprodukten JACKODUR LIGNIN keine Stoffe enthalten sind, die

- SVHC entsprechend Verordnung (EG) 1907/2006 (REACH)
- HBCD
- halogenierte Treibmittel wie (H)F(C)KW
- CMR-Stoffe der Kategorie 1A/1B entsprechend CLP-Verordnung 1272/2008

sind.

Arendsee, 11.05.2026

Daniel Geigenfeind
Geschäftsführer

i.V. Dr. Mark Plate
Sustainability and Product Stewardship