ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	FALCO Zrt.
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-FAL-20240509-CBI1-EN
Issue date	09/07/2025
Valid to	08/07/2030

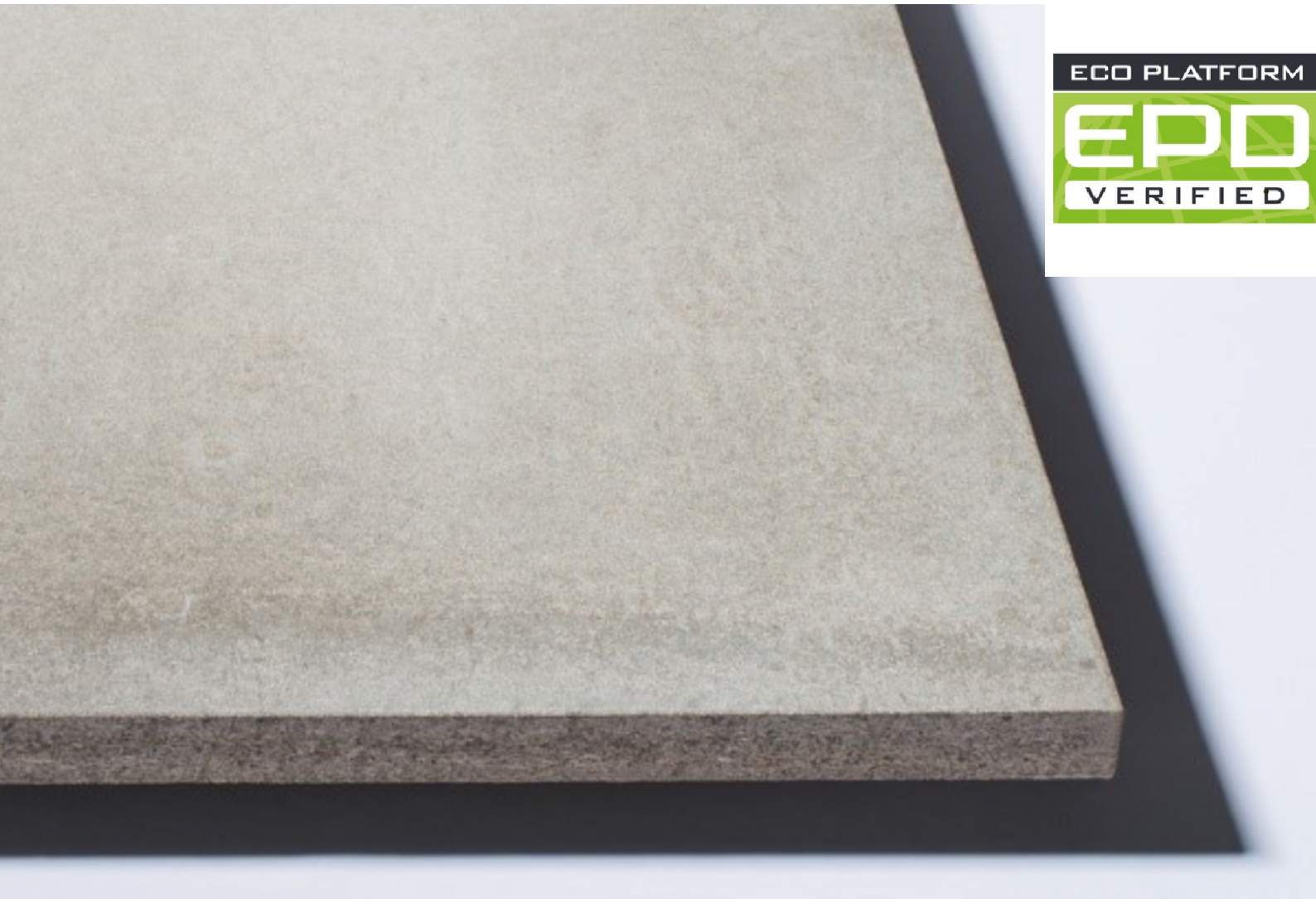
BETONYP - Cement Bounded Particle Board

FALCO Zrt.

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

www.ibu-epd.com | https://epd-online.com



General Information

FALCO Zrt.

Programme holder

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

Declaration number

EPD-FAL-20240509-CBI1-EN

This declaration is based on the product category rules:

Wood cement - Mineral-bonded wooden composites, 01/08/2021
(PCR checked and approved by the SVR)

Issue date

09/07/2025

Valid to

08/07/2030

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

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

BETONYP - Cement Bounded Particle Board

Owner of the declaration

FALCO Zrt.
Zanati út 26
9700 Szombathely
Hungary

Declared product / declared unit

1 ton BETONYP - Cement Bounded Partical Board

Scope:

BETONYP is a Cement Bounded Particle Board manufactured at the FALCO Zrt. site in Szombathely, Hungary.

BETONYP is a special combination of debarked pine wood cement, waterglass and water. It is characterised by their resistance to moisture and frost, fungi and insects, as well as their low flammability and fire-retardant properties. It is used where lightweight construction and facing elements require toughness and durability.

The EPD for BETONYP is representative for BETONYP produced in the standard dimensions 3200 mm x 1250 mm and 2800 x 1250 mm in thicknesses from 8 to 40 mm.

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

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

Verification

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

Mrs Dariya Hadzhiyska,
(Independent verifier)

Product

Product description/Product definition

One of the most successful products of FALCO Zrt. is the Cement Bounded Particle Board, called BETONYP. It is used where lightweight construction and facing elements require toughness and durability. BETONYP is characterised by their resistance to moisture and frost, fungi and insects, as well as their low flammability and fire-retardant properties.

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration EN 13986:2015, Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking, and the CE-marking.

BETONYP is CE certified, Fire class B-s1, d0 (according to EN 13501-1). Once a year, the production process is reviewed by ÉMI (accredited Hungarian control institute for the building industry).

For the application and use, the respective national provisions apply.

Application

BETONYP can be used or further processed for

- facing elements, e.g. exterior facade cladding, false ceiling, interior space divider, etc.
- auxiliary panel elements for lightweight and traditional construction systems, e.g. interior space divider panels, ceiling elements, facing panels and
- shuttering elements.

Technical Data

The table below indicates the technical specifications including the reference to the test methods/test standards of BETONYP.

Constructional data

Name	Value	Unit
Board sizes	3200 x 1250 and 2800 x 1250	mm x mm
Thickness (MSZ EN 324-1)	sanded ± 0,3	mm
	unsanded	
	< 12: ± 0,7	mm
	12 ≤ t < 15: ± 1,0	mm
	15 ≤ t < 19: ± 1,2	mm
	≥ 19: ± 1,5	mm
Lenght and width (MSZ EN 324-1)	± 5,0	mm
Straightness tolerance (MSZ EN 324-2)	≤ 1,5	mm/m
Squareness tolerance (MSZ EN 324-2)	≤ 2	mm/m
Moisture content (MSZ EN 322)	6 - 12	%
Density (MSZ EN 323)	≥ 1000	kg/m³
Bending strength (MSZ EN 310)	9	N/mm²
Modulus of elasticity (MSZ EN 310)	I. class min: 4500	N/mm²
	II. class min: 4000	N/mm²
Internal bond (EN 319)	0,5	N/mm²
Internal bond after cyclic stress (MSZ EN 319, EN 321)	0,3	N/mm²
Swelling in 24 h (MSZ EN 317)	1,5	%
Swelling in 24 h after cyclic stress (MSZ EN 317, MSZ EN 321)	1,5	%
Dimensional change under the influence of moisture (MSZ EN 318)	On 20 °C degrees, under the influence of increasing air humidity from 25 % to 85 %, it can be max. 0,3 %	
Thermal conductivity (MSZ EN ISO 13787:2003)	0,23	λW/mK
Buckling, distortion; Delamination; Extraneous materials (stone, metal, grit); Surface contamination; Edge defect Visual inspection	Not allowed	

The performance data of the product is according to the standards mentioned in the first column in the table for constructional data.

Product according to the CPR, based on a hEN: Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to EN 13986:2004+A1.

Base materials/Ancillary materials

Name	Value	Unit
raw particle board	18.6	%
portland cement	73,0	%
natron water glass	0,9	%
water	7,5	%

The product BYTONYP - Cement bounded partical board according to the 1272/2008/EK policy (regarding the classification, labeling and packaging of substances and

mixtures) and its annexes are not considered to be dangerous.

This product contains substances listed in the candidate list (date: 22.07.2024) exceeding 0.1 percentage by mass: no.

This product contains other carcinogenic, mutagenic, reprotoxic (CMR) substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: no.

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

Reference service life

The service life of BETONYP depends mainly on the service life of the building in which the panels are installed and the ambient conditions (outdoor or indoor use). Due to the wide range of applications, no statement can be made about the service life.

LCA: Calculation rules

Declared Unit

1 ton BETONYP - Cement Bounded Particle Board was chosen as the declared unit.

BETONYP is mainly used as a cladding element, e.g. as exterior façade cladding, intermediate decks, interior room dividers, as auxiliary panel elements for lightweight and traditional construction systems, as room divider panels, as ceiling elements, as facing formwork or shuttering elements.

Declared unit and mass reference

The declared unit comprises the following boundary conditions:

Name	Value	Unit
Gross density	1314	kg/m^3
Declared unit	1	t
Layer thickness	10	mm
Weight per unit area	13,14	kg/m²

The basis for modelling is the produced amount of BETONYP in the business year 2022/2023 from 10.2022 to 09.2023 at the FALCO Zrt. site in Szombathely, Hungary. The data collected was converted to 1 ton with the help of LCA software (Umberto). The representative layer thickness of 10 mm was chosen. CBPBs with a thickness of 10 mm were the largest quantity FALCO Zrt. produced in the 2022/2023 financial year (33,48 % of the total quantity).

Falco Zrt. offers BETONYP - cement bonded particleboard in standard dimensions of 3200 mm x 1250 mm and 2800 x 1250 mm in thicknesses from 8 to 40 mm. This wide range of specifications offers the customer maximum flexibility, while the formulation of the boards themselves changes only slightly. The results shown are therefore considered representative of the BETONYP product group.

System boundary

The type of this EPD is cradle to gate with reported modules C1–C4 and module D (A1–A3 + C + D).

The required raw materials for BETONYP - Cement Bounded Particle Board are included in module A1. It is distinguished between the raw materials required for the glue kitchen process (Portland cement, waterglass and water) and the raw materials required for the chips preparation process (pine wood and spruce). All materials are transported (module A2) to the production site (Szombathely, HU) where they are used for manufacturing. The manufacturing processes, the arising waste and its transport as well as the raw materials for packaging and production of packaging materials are considered in module A3.

The utilisation stage is not shown (A4-A5 and B1-B7), as the presentation of the utilisation processes is associated with major uncertainties.

No efforts arise during the demolition (module C1). The transport to the waste treatment facilities is considered in module C2. At the end of life, the BETONYP - Cement Bounded Particle Board is landfilled on a sanitary landfill (module C4).

No credits arise in module D.

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

There are no secondary materials or fuels used in the primary system. Losses are incurred during the processes of chips preparation, board forming, pressing and curing, drying, sanding and cutting and packaging of the product. Those quantities were considered in the mass balances of the production processes within the modules A1 – A3. There were no CO_2 certificates available.

The GWP for the electricity mix balanced in modules A1-A3 is 0.413 kg CO_2e/kWh. The GWP for the gas mix balanced in modules A1-A3 is 0.105 CO_2e/MJ.

Geographic Representativeness

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

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. Umberto 11 software with the Ecoinvent EN 15804 3.10.1 database was used to model the life cycle assessment for the production and disposal of BETONYP - Cement Bounded Particle Board.

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

Pine wood and spruce contain biogenic carbon. Pine wood contains 0.25 kgC/kg and spruce contains 0.24 kgC/kg amounting to respectively 52.35 kgC and 1.91 kgC per declared unit. In total, this amounts to 54.26 kgC per declared unit of 1 ton.

Within the packaging material, biogenic carbon is only bound in the wooden legs. They contain 0.223 kgC/kg. The belt, labels and stretch foil do not contain any biogenic carbon. Overall, the packaging material contains 4.54 kgC bound in 20.4 kg wooden legs per declared unit of 1 ton.

Since no further information on the specific effects of carbonation is available, the effects were not considered in the calculations. We assume that CO_2 is sequestered in a chemical reaction. However, carbonation depends on the installation of the product (inside or outside of a building) and therefore module B is not considered.

The landfilling of the BETONYP is considered in module C4. The biogenic materials remain permanently bound in the BETONYP at the end of the life cycle. Methodologically, delayed emissions or permanent storage are not taken into account.

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

Information on the end of life (C1-C4)
At the end of life, the CBPB is landfilled on a sanitary landfill, since the included Portland cement cannot be recycled or used for incineration with the purpose of energy recovery.

End of life (C1-C4)

Name	Value	Unit
Collected as mixed construction waste	1000	kg
Landfilling	1000	kg

LCA: Results

The following table contains the LCA results for a declared unit of 1 ton BETONYP with a surface weight of 13,14 kg/m².

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

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 t BETONYP - Cement Bounded Particle Board

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 eq	8.17E+02	0	1.46E+01	0	3.32E+01	0
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	1.13E+03	0	1.46E+01	0	8.46E+00	0
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	-3.09E+02	0	0	0	3.22E+02	0
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	3.68E-01	0	4.86E-03	0	4.97E-03	0
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	9.29E-06	0	2.9E-07	0	2.1E-07	0
Acidification potential of land and water (AP)	mol H^+ eq	2.9E+00	0	3.04E-02	0	5.88E-02	0
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	2.17E-01	0	9.89E-04	0	6.91E-02	0
Eutrophication potential aquatic marine (EP-marine)	kg N eq	7.54E-01	0	7.31E-03	0	1.3E-01	0
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	8.01E+00	0	7.88E-02	0	2.43E-01	0
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	2.85E+00	0	5.06E-02	0	8.98E-02	0
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	3.85E-03	0	4.86E-05	0	1.98E-05	0
Abiotic depletion potential for fossil resources (ADPF)	MJ	9.01E+03	0	2.06E+02	0	1.82E+02	0
Water use (WDP)	m^3 world eq deprived	1.35E+02	0	1E+00	0	8.07E-01	0

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 t BETONYP - Cement Bounded Particle Board

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	2.09E+03	0	3.53E+00	0	2.66E+00	0
Renewable primary energy resources as material utilization (PERM)	MJ	2.32E+03	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ	4.41E+03	0	3.53E+00	0	2.66E+00	0
Non renewable primary energy as energy carrier (PENRE)	MJ	9.01E+03	0	2.06E+02	0	1.82E+02	0
Non renewable primary energy as material utilization (PENRM)	MJ	0	0	0	0	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	9.01E+03	0	2.06E+02	0	1.82E+02	0
Use of secondary material (SM)	kg	2.82E+00	0	9.53E-02	0	6.98E-02	0
Use of renewable secondary fuels (RSF)	MJ	4.96E+00	0	1.21E-03	0	1.38E-03	0
Use of non renewable secondary fuels (NRSF)	MJ	0	0	0	0	0	0
Use of net fresh water (FW)	m^3	3.83E+00	0	2.76E-02	0	-1.04E+00	0

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 t BETONYP - Cement Bounded Particle Board

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	1.86E+02	0	3E-01	0	6.81E+02	0
Non hazardous waste disposed (NHWD)	kg	1.39E+03	0	6.33E+00	0	1.59E+03	0
Radioactive waste disposed (RWD)	kg	2.88E-02	0	6.62E-05	0	4.21E-05	0
Components for re-use (CRU)	kg	0	0	0	0	0	0
Materials for recycling (MFR)	kg	0	0	0	0	0	0
Materials for energy recovery (MER)	kg	0	0	0	0	0	0
Exported electrical energy (EEE)	MJ	0	0	0	0	0	0
Exported thermal energy (EET)	MJ	0	0	0	0	0	0

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 t BETONYP - Cement Bounded Particle Board

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Incidence of disease due to PM emissions (PM)	Disease incidence	2.96E-05	0	1.08E-06	0	1.33E-06	0
Human exposure efficiency relative to U235 (IR)	kBq U235 eq	1.19E+02	0	2.67E-01	0	1.72E-01	0

Comparative toxic unit for ecosystems (ETP-fw)	CTUe	2.24E+03	0	5.6E+01	0	1.34E+02	0
Comparative toxic unit for humans (carcinogenic) (HTP-c)	CTUh	2.44E-06	0	1.04E-07	0	7.88E-08	0
Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	8.25E-06	0	1.33E-07	0	2.94E-07	0
Soil quality index (SQP)	SQP	2.53E+04	0	1.24E+02	0	6.23E+02	0

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. 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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

This EPD was created using a software tool.

References

Standards

CEN/TR 15941
CEN/TR 15941, Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data.

DIN EN 13501-1
DIN EN 13501-1, Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.

DIN EN 13698-1
DIN EN 13698-1, Pallet production specification - Part 1: Construction specification for 800 mm×1200 mm flat wooden pallets.

DIN EN 13986
DIN EN 13986:2015-06, Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking.

DIN EN 14322
DIN EN 14322:2022-02, Wood-based panels - Melamine faced boards for interior uses - Definition, requirements and classification.

DIN EN 15804
DIN EN 15804:2022-03, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.

DIN EN 312
DIN EN 312:2010-12, Particleboards – Specifications.

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

ISO 14040
DIN EN ISO 14040:2021-02, Environmental management - Life cycle assessment - Principles and framework.

ISO 14044
ISO 14044:2006-07, Environmental management - Life cycle assessment - Requirements and guidelines.

Laws and regulations

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

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

1272/2008/EK
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. The European Parliament and the Council of the European Union.

ECHA-Candidate List
List of substances of very high concern (SVHC) that may be subject to authorization (ECHA Candidate List), dated 22.07.2024, published in accordance with Article 59 (10) of the REACH Regulation. Helsinki: European Chemicals Agency.

PCR

PCR Part A
Product Category Rules (PCR) Part A,
Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019, Version 1.4. (Institut Bauen und Umwelt e.V), 15.04.2024.

PCR Part B
Product Category Rules (PCR) Part B, Requirements on the EPD for Wood cement - Mineral-bonded wooden composites, Version 6 (Institut Bauen und Umwelt e.V), 01.08.2024.

Software and databases

Ecoinvent EN 15804
Database version 3.10. Revision 1

Umberto 11
Umberto, LCA Software for modelling life cycle assessments, Version 11.13.1 (Rev. 0), Reutlingen: iPoint--Systems Gmbh, [accessed 18.03.2025].

Literature

MEKH
MEKH A Magyar Villamosenergia-Rendszer (Ver) 2021. Évi Adatai – Data of the Hungarian Electricity System, 2021, https://www.mekh.hu/electricity-publications

Nutsch, 1980
Nutsch, Wolfgang; et al., 1980: Fachkunde für Schreiner. 12. Auflage. Vollmer: Europa-Lehrmittel Nourney.

Vares, 2005
Vares V., Kask Ü., Muiste P., Pihu T., Soosaar S., 2005: Manual for Biofuel Users. Tallin University of Technology.

Weidema B P, et al.
Weidema B P, et al., Overview and methodology – Data quality guideline for the ecoinvent database version 3 (final); Ecoinvent report No. 1(v3); (06.05.2013). Weidema B. P., Bauer C., Hischier R., Mutel C., Nemecek T., Reinhard J., Vadenbo C. O., Wernet G.; St. Gallen (Swiss Centre for Life Cycle Inventories).

Further sources

EMI
Non-Profit Limited Liability Company for Quality Control and Innovation in Building,
https://emi.hu/EMI/web.nsf/Pub/index.html

Publisher

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Programme holder

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Author of the Life Cycle Assessment

GfBU-Consult
Mahlsdorfer Straße 61b
15366 Hoppegarten / OT Hönow
Germany

030/9928820
info@gfbu-consult.de
www.gfbu-consult.de

Owner of the Declaration

FALCO Zrt.
Zanati út 26
9700 Szombathely
Hungary

+36 94 516-600
office@falco-woodindustry.com
www.kronospan-worldwide.com