ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	Kronospan Luxembourg S.A.
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-KRO-20230157-CBA1-EN
Issue date	11.07.2023
Valid to	10.07.2028

Oriented Strand Board (OSB)

Kronospan Luxembourg S.A.

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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General Information

Kronospan Luxembourg S.A.

Programme holder

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

Declaration number

EPD-KRO-20230157-CBA1-EN

This declaration is based on the product category rules:

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

Issue date

11.07.2023

Valid to

10.07.2028

Dipl.-Ing. Hans Peters
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Oriented Strand Board (OSB)

Owner of the declaration

Kronospan Luxembourg S.A.
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Declared product / declared unit

1m3 Oriented Strand Board (OSB)

Scope:

This document applies to Oriented Strand Board (OSB), which is a structural-use panel based on layered wood strands bonded with water-resistant resin. The declared unit weight is 630 kg/m3. LCA data were compiled using foreground data collected based on billing documents and material balances for the period between October 2020 and March 2022. The declaration holder is responsible for the underlying data and its verification.
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

Mr Olivier Muller,
(Independent verifier)

Product

Product description/Product definition

Oriented Strand Board (OSB) are wooden panels made from oriented wood strands connected by resin, in range of thickness 6-38 mm. OSB is developed and manufactured entirely in compliance with the current demand of ecological living focused on organic materials. Selecting suitable wood and binder, OSB meets high standards of not only environmental buildings.

Product characteristics:

- High durability and resistance
- High load-bearing capacity
- High performance material
- High stability

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 13986:2004 + A1:2015, Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking - and the CE-marking. For the application and use the respective national provisions apply.

Application

- Load-bearing cladding of exterior walls or roofs
- Structural floor decking
- Sub- floors and base boards for flooring systems
- Internal non load-bearing cladding of walls and ceilings, partitions
- Attic conversions or extensions
- Framework for upholstered furniture
- Packaging
- Warehouse management (racks, fences, etc.)

Technical Data

Performance data of the product are in accordance with its Declaration of performance (DoP) and with respect to the Essential characteristics according to :

- EN 13986 + A1:2015 Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking.
- EN 300 - Oriented Strand Boards (OSB) - Definitions, Classification and Specifications.

For more details on technical information, please see technical brochure Kronobuild.

Quality assurance according to EN 300 and EN 13986:2004+A1:2015 - type OSB 3. Reaction to fire classification acc. EN 13501-1: class D-s2,d0 for thicknesses 8-38 mm.

Constructional data

Name	Value	Unit
Gross density	580 - 680	kg/m^3
Grammage	4.64 - 25.84	kg/m^2
Bending strength (longitudinal) acc. to EN 310	14 - 22	N/mm^2
Bending strength (transverse) acc. to EN 310	7 - 11	N/mm^2
E-module (longitudinal) acc. to EN 310	≥ 3500	N/mm^2
E-module (transverse) acc. to EN 310	≥ 1400	N/mm^2
Material dampness at delivery acc. to EN 322	2 - 12	%
Tensile strength rectangular acc. to EN 319	0.26 - 0.34	N/mm^2
Thermal conductivity acc. to EN 13986	0.1	W/(mK)
Formaldehyde emissions E1 acc. to EN 717-1 or E1 DE 2020 ChemVerbotsV (E05)	-	µg/m^3

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to EN 13986:2004 + A1:2015.

Base materials/Ancillary materials

The OSB3 panels are made of 84% of vigin wood, 12% of recycled wood, 3% of polymeric isocyanate (pMDI), and 1,5% of other additives.
This product contains substances listed in the candidate list (date: 08.03.2023) exceeding 0.1 percentage by mass: no.

Reference service life

The service life is assumed to be 100 years, as OSB is a structural element of a building.

Since no use impacts are quantified (the products do not require energy, maintenance or other reparation process during its use), this lifetime parameter does not influence the results.

LCA: Calculation rules

Declared Unit

This declaration applies to 1 m3 of Oriented Strand Board (OSB), with a declared unit weight of 630 kg/m3.

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	m^3
Mass reference	630	kg/m^3
Layer thickness	0.016	m

Foreground data for the production processes (A1-A3) were collected from the Kronospan production site (Sanem, Luxembourg) and are and representative for the period of October 2020 to March 2022. The manufacturing data are specific to the technologies used in the plant and representative of the local geographical context. Market share data specific to each product category from the year 2021 were used to model the transport to building site (module A4).

For the further life cycle stages (modules A5 to D), generic inventory data are used. These processes are not specific to Kronospan products and reference data or statistics were applied. The inputs of outputs of these processes were mainly based on the COFIDAB report prepared by FCBA (2012) and associated French EPD ('FDES') published by FCBA. The shares between various disposal routes for packaging waste (module A5) were based on European statistics for the year 2019.

The *ecoinvent database version 3.8* was used to model background data. The average dataset based on European data is used to model the glue production (no specific supplier data used).

System boundary

Type of EPD: Cradle-to-grave (with options) The system boundaries of the EPD follow the modular construction system

as described by *EN 15804*.

The LCA considers the following modules:
- A1-A3: Manufacturing of pre-products, packaging, ancillary materials, transport to the factory and production, with the associated energy supply and waste handling
- A4: Transport to the construction site
- A5: Installation into the building including disposal of packaging
- C1: Deconstruction (screws disposal and electricity from the screwdriver)·
- C2: Transport to disposal sites
- C3: Final product waste disposal for reuse, recycling and energy recovery
- C4: Waste disposal, namely incineration and landfill
- D: Potential for reuse, recovery and/or recycling including benefits for product incineration from module C4

Geographic Representativeness

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

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.

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The biogenic carbon content quantifies the amount of biogenic carbon in a construction product leaving the factory gate, and it shall be separately declared for the product and for any accompanying packaging.
If the total mass of biogenic carbon containing materials is less than 5 % of the total mass of the product and accompanying packaging, the declaration of biogenic carbon content may be omitted. The mass of packaging containing biogenic carbon shall always be declared.

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

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in product	360.9	kg C
Biogenic carbon content in accompanying packaging	13.9	kg C

Transport to the building site (A4)

Name	Value	Unit
Transport distance (truck)	501	km
Gross density of products transported	640.5	kg/m^3

Installation into the building (A5)

Name	Value	Unit
Auxiliary (screw)	1.48	kg
Electricity consumption	0.062	kWh
Material loss	50.4	kg
Product loss to recycling	57.5	%
Product loss to incineration	25.5	%
Product loss to landfill	17	%
Packaging waste	11.01	kg

The refence service life does not affect the results since no use impacts are quantified.

End of life (C1-C4)

Name	Value	Unit
Collected separately	425.5	kg
Collected as mixed construction waste	204.8	kg
Recycling	362.4	kg
Energy recovery	160.7	kg
Landfilling	107.2	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Name	Value	Unit
Avoided virgin wood production	362	kg
Avoided virgin wood transport	26.5	tkm
Avoided drying energy	100	MJ
Avoided energy from incineration	2249	MJ

LCA: Results

The results displayed below apply to 1 m^3 of Kronospan OSB3 panel, with a declared unit weight of 630 kg/m^3.

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

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

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m3 Kronospan OSB3 panel

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	-1.22E+03	3.16E+01	1.15E+02	2.53E-02	5.24E+00	9.01E+02	4.43E+02	6.62E+02
GWP-fossil	kg CO_2 eq	2.18E+02	3.16E+01	3.9E+00	2.45E-02	5.24E+00	7.2E+00	1.77E+00	-9.95E+01
GWP-biogenic	kg CO_2 eq	-1.44E+03	3.21E-02	1.12E+02	7.69E-04	4.71E-03	8.94E+02	4.41E+02	7.63E+02
GWP-luluc	kg CO_2 eq	1.92E+00	1.14E-02	2.66E-03	5.78E-05	2.06E-03	1.56E-02	5.43E-04	-1E+00
ODP	kg CFC11 eq	4.98E-05	7.54E-06	3.2E-07	1.23E-09	1.21E-06	4.2E-07	4.36E-07	-1.52E-05
AP	mol H^+ eq	1.53E+00	1.32E-01	2.14E-02	1.39E-04	2.13E-02	5.77E-02	3.8E-02	-1.64E-01
EP-freshwater	kg P eq	1.89E-02	2.16E-04	1.53E-04	2.61E-06	3.67E-05	7.05E-04	2.72E-05	-6.97E-03
EP-marine	kg N eq	3.59E-01	3.98E-02	6.69E-03	1.77E-05	6.34E-03	1.44E-02	2.02E-02	-5.99E-02
EP-terrestrial	mol N eq	3.46E+00	4.39E-01	6.81E-02	2.04E-04	7E-02	1.65E-01	1.95E-01	-6.05E-01
POCP	kg NMVOC eq	1.55E+00	1.41E-01	2.37E-02	5.62E-05	2.14E-02	4.4E-02	5.42E-02	-4.57E-01
ADPE	kg Sb eq	2.57E-03	7.24E-05	4.06E-05	2.27E-07	1.82E-05	6.33E-05	6.28E-06	-8.97E-05
ADPF	MJ	4.45E+03	4.92E+02	4.34E+01	5.18E-01	7.92E+01	1.46E+02	3.32E+01	-1.44E+03
WDP	m^3 world eq deprived	1.34E+02	1.69E+00	8.21E-01	6.07E-03	2.37E-01	1.81E+00	4E-01	-4.84E+00

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m3 Kronospan OSB3 panel

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	2.4E+02	6.26E+00	3.24E+00	1.04E-01	1.12E+00	8.82E+02	1.37E+03	0
PERM	MJ	1.53E+04	0	0	0	0	-5.95E+03	-1.37E+03	0
PERT	MJ	1.56E+04	6.26E+00	3.24E+00	1.04E-01	1.12E+00	-5.07E+03	0	0
PENRE	MJ	4.78E+03	5.23E+02	4.59E+01	5.44E-01	8.41E+01	1.53E+02	3.54E+01	-1.59E+03
PENRM	MJ	0	0	0	0	0	0	0	0
PENRT	MJ	4.78E+03	5.23E+02	4.59E+01	5.44E-01	8.41E+01	1.53E+02	3.54E+01	-1.59E+03
SM	kg	8.08E+01	0	0	0	0	0	0	3.62E+02
RSF	MJ	9.76E+03	0	0	0	0	0	0	2.25E+03
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m^3	1.5E+01	2.44E-01	7.54E-02	8.67E-03	4.89E-02	2.34E+00	8.9E-02	-2.81E-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 material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m3 Kronospan OSB3 panel

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	7.11E-03	1.19E-03	2.1E-04	3.94E-07	2.07E-04	1.27E-04	5.58E-05	-3.26E-03
NHWD	kg	6.7E+01	4.6E+01	1.45E+01	1.81E-03	4.07E+00	9.05E-01	1.08E+02	-5.49E+00
RWD	kg	1.45E-02	3.33E-03	1.41E-04	3.79E-06	5.36E-04	1.04E-03	1.77E-04	-1.56E-03
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	3.62E+02	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	0	0
EET	MJ	0	0	8.44E+02	0	0	8.82E+02	1.37E+03	0

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m3 Kronospan OSB3 panel

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	7.84E-05	3.71E-06	3.54E-07	3.84E-10	4.51E-07	2.91E-07	4.16E-07	-9.61E-07
IR	kBq U235 eq	1.26E+01	2.13E+00	1.18E-01	4.6E-03	3.44E-01	1.26E+00	1.3E-01	-1.03E+00
ETP-fw	CTUe	1.15E+04	3.84E+02	1.08E+02	3.28E-01	6.18E+01	1.02E+02	4.03E+01	-3.12E+02
HTP-c	CTUh	2.88E-06	1.06E-08	2.91E-08	1.01E-11	2E-09	2.15E-08	2.97E-08	-3.93E-08
HTP-nc	CTUh	3.15E-05	4.21E-07	1.25E-07	3.22E-10	6.48E-08	1.41E-07	1.07E-07	-9.94E-07
SQP	SQP	3.34E+04	5.63E+02	2.4E+01	9.4E-02	5.44E+01	2.7E+01	6.52E+01	-1.79E+04

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

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.

References

Standards

EN 15804:2012+A2:2019+AC:2021
Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

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

EN 300
Oriented Strand Boards (OSB) - Definitions, Classification and Specifications.

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

Further References

PCR 2021, Part A
PCR Guidance-Texts for Building-Related Products and Services: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019

PCR 2023, Part B
PCR-Guidances-Texts for Building-Related Products and Services. Part B: Requirements on the EPD for Wood based panels

FCBA (2012)
Rapport d'étude Volet 2 – Prise en compte de la fin de vie des produits bois. Convention DHUP/CSTB 2009 Action 33 – Sous action 5. ACV & Déclarations environnementales pour des produits et composants de la construction bois.

FCBA (2019)
Fiche de déclaration environmentale et sanitaire (FDES) – Panneaux de lamelles de bois minces orientées OSB (oriented strand board) de type 3 (panneaux travaillants utilisés en milieu humide) bruts. Epaisseur déclarée : 18 mm. FDES collective 2-90 :2018.

FCBA (2022a)
Fiche de déclaration environmentale et sanitaire (FDES) – Panneaux de lamelles de bois minces orientées OSB (oriented strand board) de type 3 (panneaux travaillants utilisés en milieu humide) bruts. Epaisseur déclarée : 12 mm. FDES collective 132289692502022.

FCBA (2022b)
Fiche de déclaration environmentale et sanitaire (FDES) – Panneaux de fibres MDF (medium-density fibrebord) utilisés en milieu humide bruts. Epaisseur déclarée : 18 mm. FDES collective 182289782502022.

FCBA (2022c)
Fiche de déclaration environmentale et sanitaire (FDES) – Panneaux de fibres MDF (medium-density fibrebord) utilisés en milieu humide bruts. Epaisseur déclarée : 19 mm. FDES collective 341289752502022.

SimaPro software and ecoinvent database:2021
SimaPro software ecoinvent database, version 3.8, 2021

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