

# Environmental Product Declaration



In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

## ***OKOUME, OZIGO OR IGAGANGA PLYWOOD, BONDED WITH A PF RESIN-BASED GLUE, MADE IN FRANCE, UNCOATED***

from

**CODIFAB** (Professional Committee for the Development of the French Furniture and Wood Industries)



Programme:	The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a>
Programme operator:	EPD International AB
Type of EPD	Sector EPD based on the results of the average product manufactured by French plywood producers
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*An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at [www.environdec.com](http://www.environdec.com)*



## General information

### Programme information

<b>Programme:</b>	The International EPD® System
<b>Address:</b>	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
<b>Website:</b>	<a href="http://www.environdec.com">www.environdec.com</a>
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### Accountabilities for PCR, LCA and independent, third-party verification

#### Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): *PCR 2019:14 Construction Products, version 1.3.2; c-PCR-006 Wood and wood-based products for use in construction (EN 16485).*

PCR review was conducted by: *The Technical Committee of the International EPD® System. A full list of members available on [www.environdec.com](http://www.environdec.com).*

#### Life Cycle Assessment (LCA)

LCA accountability:

**FCBA technological institute** (*institute for the French forest-based sector promotion and development*)

10 Rue Galilée, 77420 Champs-sur-Marne, France

<https://www.fcba.fr/en/accueil-english>

LCA by: Claire Gourdet

#### Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

EPD verification by individual verifier

Third-party verifier: *Etienne Lees-Perasso, TIDE*

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes       No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

## Company information

Owner of the EPD: CODIFAB (Professional Committee for the Development of the French Furniture and Wood Industries)

Contact: Emilie FERCHAUD, [ferchaud@codifab.fr](mailto:ferchaud@codifab.fr)

Description of the organisation: The CODIFAB, Professional Committee for the Development of the French Furniture and Wood Industries, has the mission of leading and financing collective actions that contributing companies would not have the capacity to carry out individually. CODIFAB brings together several professional organizations, including UIPC, which represents French plywood manufacturers.

## Product information

Product name: Okoume, Ozigo or Igaganga plywood, bonded with a PF resin-based glue, made in France, uncoated

Product identification: This EPD represents a range of different plywood products produced by French manufacturers. The results are presented in this EPD for 1 m<sup>3</sup> of average uncoated plywood (mix of Okoume, Ozigo and Igaganga) weighted according to the production volumes of each manufacturer.

The plywood panel must comply with the requirements of EN 636+A1 - Plywood - Requirements and EN 13986+A1 - Wood-based panels for construction - Characteristics, conformity assessment and marking.

Product covered by the EPD: The product covered by this EPD is a plywood panel made from 100% okoume or 100% ozigo or 100% igaganga veneers bonded with a phenol-formaldehyde (PF) resin-based glue mix and manufactured in France. The manufacture of plywood panels involves the following phases: veneer drying (when necessary), gluing, pressing, finishing (trimming, sanding).

Plywood panels are sustainable material suitable for multiple different uses in building and construction applications, such as roofing, flooring and wall sheeting. It can be used in structures falling into use classes 2 and 3.1 as defined in standard NF EN 335. Use class 2 corresponds to situations where the wood is used in an indoor environment or under shelter protected from the weather and may be subject to occasional non-persistent dampening (condensation). Use class 3.1 refers to situations where the wood may be subjected to frequent wetting over short periods of time, without the wood contact with the ground. According to its use, the service life of the plywood board goes from 50 to 100 years.

The product contains no more than 0.1% by mass of substances on the REACH candidate list.

### Declared product description:

The average product manufactured by French plywood producers is a fictional panel made from okoume (99,6%), ozigo (0,4%) and igaganga (0,0%) veneers bonded with phenol formaldehyde resin-based glue mix.

UN CPC code: 31410

Geographical scope: The plywood considered in this EPD are manufactured in France and modules A1–A3 represent this location. Plywood products are used across Europe and therefore modules A4–A5, B, C and D represent European countries.

## LCA information

**Declared unit:** 1 m<sup>3</sup> of 100% okoume or 100% ozigo or 100% igaganga plywood panels, bonded with a phenol-formaldehyde (PF) resin-based glue mix, manufactured in France, uncoated for multiple uses in compliance with bonding class 1, 2, or 3 according to EN 314-2, and service class 1, 2 or 3 according to EN 636-2 (cladding, bracing, roofing support, flooring). Plywood density is 511 kg/m<sup>3</sup>.

**Reference service life:** According to the plywood use (cladding, bracing, roofing support, flooring), the service life of the panel goes from 50 to 100 years.

**Time representativeness:** Manufacturers-specific data (module A3) represent year 2023. Time representativeness of secondary data used was mainly good.

**Database(s) and LCA software used:** Simapro software version 9.6 is used for modeling and calculation of results. Used database is Ecoinvent version 3.10 (cut-off system model) and data from LCIA published in 2022 by ATIBT (International Tropical Timber Technical Association), which is a trade association representing the private tropical forest sector.

**Description of system boundaries:** The system boundaries of this EPD are Cradle to gate with options, modules C1–C4, module D and with optional module A4 (A1–A3 + A4 + A5 + C + D). See table and system diagram below for information on declared modules. The results of the end-of-life stage (module C) should be considered when using the results of the production stage (modules A1-A3).

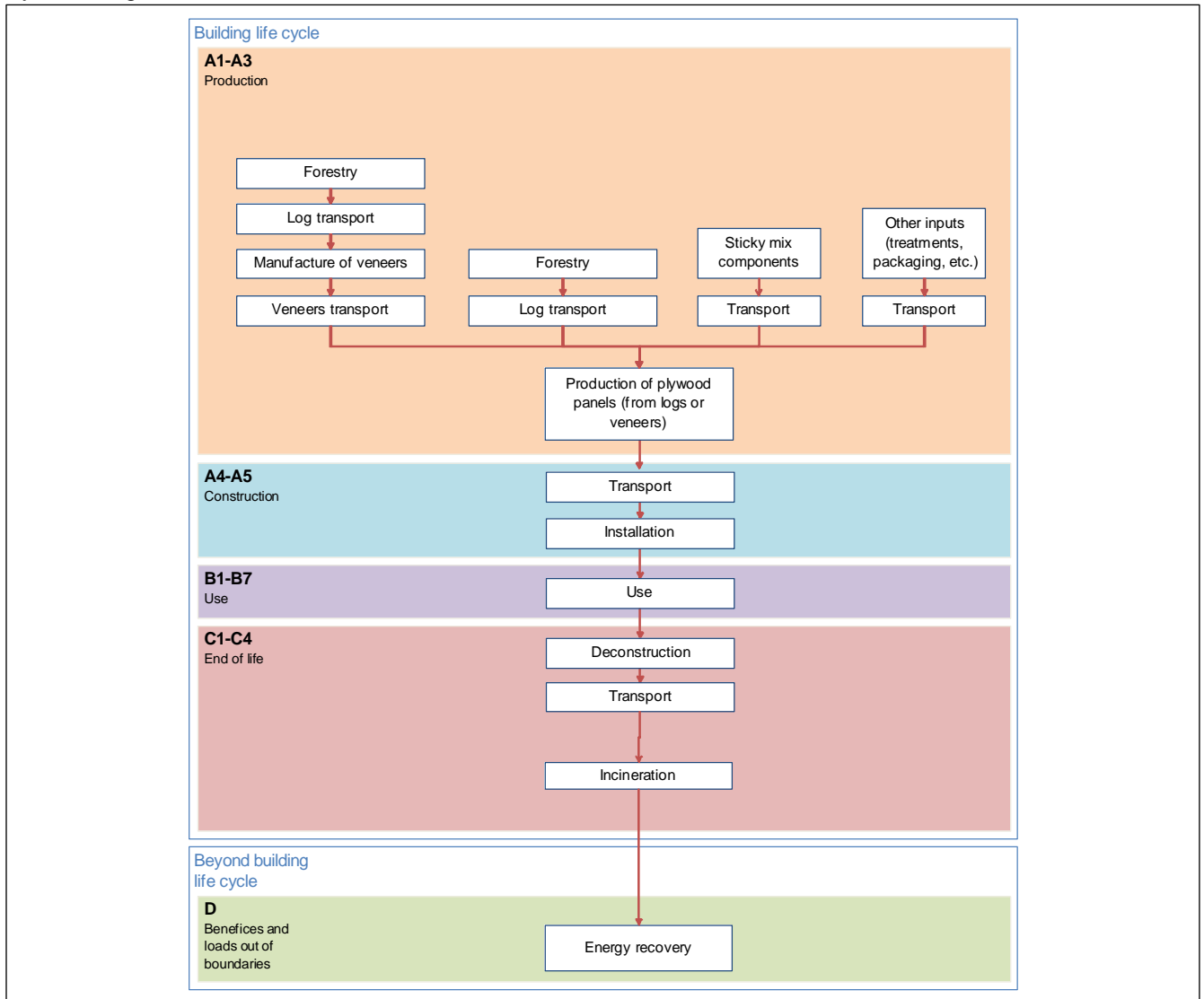
**Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):**

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage	
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential	
<b>Module</b>	<b>A1</b>	<b>A2</b>	<b>A3</b>	<b>A4</b>	<b>A5</b>	<b>B1</b>	<b>B2</b>	<b>B3</b>	<b>B4</b>	<b>B5</b>	<b>B6</b>	<b>B7</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>	<b>D</b>	
Modules declared	x	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x	
Geography	FR			EU														EU
Primary data used <sup>1</sup>	73%			-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation – products	6%			-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation - sites	3%			-	-	-	-	-	-	-	-	-	-	-	-	-	-	

FR: France; EU: Europe

<sup>1</sup>The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that do not capture all relevant aspects of data quality. The indicator is not comparable across product categories.

System diagram:



Module description:

Module A1 includes the production of raw materials and energy used in the manufacturing of the plywood panels. Tropical veneers are sourced from Gabon.

Module A2 comprises of transportation processes up to the plywood mills gates. Wood veneers are shipped to the mills by road and boat.

Module A3 includes the direct emissions of the manufacturing processes at the plywood mills, production of auxiliary and packaging materials, treatment of solid wastes and pre-treatment of wastewater. The manufacture of plywood panels involves the following phases: veneer drying when necessary, gluing, pressing, finishing (trimming, sanding). Plywood panels are produced in compliance with bonding class 1, 2, or 3 according to EN 314-2, and service class 1 or 2 according to EN 636-2. Plywood plants have onsite energy plants that use wood residues from plywood manufacturing as fuel. French residual electricity mix used in manufacturing is produced mostly with nuclear power (GWP-GHG indicator: 0,187 kg CO<sub>2</sub> eq/kWh).

Module A4 describes the transportation of plywood products to end users in multiple European countries. This stage considers a lorry >32 metric ton, EURO6. The transport distance considered is 1149 km.

Module A5 considers plywood wastage and product packaging management. 10% of wastage are considered for the installation process. No installation scenario is declared because it depends on the plywood panel use.

Modules B1–B7 describe the use stage of plywood board installed in a building. These modules are not declared in the present EPD.

Modules C1–C4 describe the deconstruction of the plywood (C1), transportation to waste processing (C2), waste processing (C3) and disposal (C4). Plywood is assumed to be recovered as energy, of which burdens belong to module C3, and no activities are included in module C4. Module D describes the material and energy resource recovery across the life cycle.

C1	The demolition is assumed to be realised manually; therefore, no energy or other inputs is consumed during this stage.
C2	Waste are transported over 50 km to the management site. Transport is realised by trucks (lorry 16-32 metric ton, EURO6).
C3	100 % energy recovery. 594 kg/m <sup>3</sup> of plywood waste (wood and glue) are valorised.
C4	No waste goes to final disposal.
D	Energy recovery allows avoiding natural gas and electricity consumption (from the average European electric mix). Heat and electric efficiency ratios considered for energy recovery are 26% for heat and 14% for electricity.

Cut-off criteria:

All material and energy flows known to be likely to cause significant emissions into the air, water or soil have been included. The omitted flows comply with the cut-off rule defined in standard EN 15804+A2.

Allocation:

The assignment rules laid down in standards EN 15804+A2, and EN 16485 have been complied with:

- assignment avoided wherever possible.
- allocation based on physical properties (e.g. mass, volume) when the difference in income generated by co-products is small.
- in all other cases, allocation based on economic values.
- material flows with specific inherent properties, e.g. energy content, elemental composition (e.g. biogenic carbon content), always allocated to reflect physical flows, regardless of the allocation chosen for the process.

Recycled content (allocation) and/or biomass balance (BMB) allocation approaches such as the “mass balance credits” method and/or the “Book and Claim” method in accordance with ISO 22095 cannot be used for ECO EPDs.

Representativeness:

Specific primary data were collected for the year 2023 from French plywood panels producers.

Most of the generic LCI data used comes from the Ecoinvent V3.10 database, which was last updated in March 2024. They correspond to processes taking place in France, Europe or the rest of the world, with the most accurate data selected and adjustments made where necessary. The data selected are all based on a cut-off allocation. Additionally, life cycle impact assessment data for veneers, provided by the ATIBT (International Tropical Timber Technical Association), were also used to represent the production of tropical wood veneers.

The residual 2021 French electricity mix is used for step A3.

## Content information

Composition of average French uncoated plywood is presented below with its packaging elements. These data represent a fictional product based on weighted average data collected from French plywood producers.

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Wood (dry) – Okoume	393	0%	100% biogenic material 0,49 kg C/kg (on wood dry mass basis)
Wood (dry) – Ozigo	2	0%	100% biogenic material 0,49 kg C/kg (on wood dry mass basis)
Wood (dry) – Igaganga	0	0%	100% biogenic material 0,49 kg C/kg (on wood dry mass basis)
Adhesive resin (dry) – Phenol formaldehyde	51	0%	0% biogenic material 0 kg C/kg
Others (dry) (i.e. hardeners...)	19	0%	0% biogenic material 0 kg C/kg
Water (wood moisture and water in the adhesive resin)	45	0%	0% biogenic material 0 kg C/kg
<b>TOTAL</b>	<b>511</b>	<b>0%</b>	<b>77% biogenic material 0,38 kg C/kg</b>
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Plastic film – Low density polyethylene	0,18	0%	0 kg C/kg
Plastic film – Polyethylene terephthalate	0,11	0%	0 kg C/kg
Plastic links – polypropylene	0,05	0%	0 kg C/kg
Cardboard	0,51	0,1%	0,45 kg C/kg (on cardboard dry mass basis)
Wood pallet	21,12	4,1%	0,49 kg C/kg (on wood dry mass basis)
<b>TOTAL</b>	<b>21,97</b>	<b>4,3%</b>	<b>0,41 kg C/kg</b>

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
-	-	-	-

There are no SVHC substances in the product.

## Results of the environmental performance indicators

### Mandatory impact category indicators according to EN 15804

Results per functional or declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO <sub>2</sub> eq.	4,67E+02	6,07E+01	2,99E-01	0	0	0	0	0	0	0	0	9,70E+00	1,29E+02	0	-6,15E+02
GWP-biogenic	kg CO <sub>2</sub> eq.	-7,49E+02	3,25E-02	3,27E+01	0	0	0	0	0	0	0	0	6,72E-03	7,16E+02	0	-5,10E+00
GWP-luluc	kg CO <sub>2</sub> eq.	1,95E+00	2,15E-02	4,91E-06	0	0	0	0	0	0	0	0	3,22E-03	2,58E-03	0	-4,55E-01
GWP-total	kg CO <sub>2</sub> eq.	-2,80E+02	6,08E+01	3,30E+01	0	0	0	0	0	0	0	0	9,71E+00	8,44E+02	0	-6,21E+02
ODP	kg CFC 11 eq.	5,36E-05	1,27E-06	2,46E-10	0	0	0	0	0	0	0	0	1,93E-07	1,28E-07	0	-2,17E-05
AP	mol H <sup>+</sup> eq.	4,50E+00	1,44E-01	8,46E-05	0	0	0	0	0	0	0	0	2,02E-02	1,04E-01	0	-1,02E+00
EP-freshwater	kg P eq.	2,41E-02	4,90E-04	1,40E-07	0	0	0	0	0	0	0	0	7,57E-05	1,36E-04	0	-1,38E-02
EP-marine	kg N eq.	1,67E+00	3,68E-02	8,41E-05	0	0	0	0	0	0	0	0	4,73E-03	4,96E-02	0	-2,04E-01
EP-terrestrial	mol N eq.	1,82E+01	4,07E-01	3,54E-04	0	0	0	0	0	0	0	0	5,24E-02	5,24E-01	0	-2,24E+00
POCP	kg NMVOC eq.	5,97E+00	2,49E-01	1,28E-04	0	0	0	0	0	0	0	0	3,36E-02	1,32E-01	0	-1,16E+00
ADP-minerals & metals*	kg Sb eq.	2,48E-03	1,70E-04	3,66E-08	0	0	0	0	0	0	0	0	3,16E-05	1,88E-05	0	-7,56E-04
ADP-fossil*	MJ	7,97E+03	9,12E+02	1,79E-01	0	0	0	0	0	0	0	0	1,36E+02	8,91E+01	0	-1,07E+04
WDP*	m <sup>3</sup>	5,79E+01	4,34E+00	-1,40E-02	0	0	0	0	0	0	0	0	5,67E-01	7,03E+00	0	-4,43E+01
Acronyms	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 potential for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption															

\* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.



## Additional mandatory and voluntary impact category indicators

Results per functional or declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG <sup>1</sup>	kg CO <sub>2</sub> eq.	-7,47E+02	5,40E-02	3,27E+01	0	0	0	0	0	0	0	0	9,94E-03	7,16E+02	0	-5,55E+00
PM	Disease incidences	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
IRP*	kBq U235 eq.	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ET-freshwater*	CTUe	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HTP-c*	CTUh	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HTP-n*	CTUh	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SQI*	Pt	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acronyms	GWP-GHG = Global Warming Potential greenhouse gases; PM = Particulate Matter; IRP = Ionizing Radiation Potential; ET-freshwater = Ecotoxicity freshwater; HTP-c = Human Toxicity Potential cancer; HTP-n = Human Toxicity Potential non-cancer; SQI = Soil Quality Index															

\* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

## Resource use indicators

Results per functional or declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	4,06E+02	1,45E+01	6,65E-01	0	0	0	0	0	0	0	0	2,34E+00	7,27E+03	0	-7,76E+02
PERM	MJ	9,18E+03	0	-3,31E+02	0	0	0	0	0	0	0	0	0	-7,27E+03	0	0
PERT	MJ	9,59E+03	1,45E+01	-3,30E+02	0	0	0	0	0	0	0	0	2,34E+00	2,57E+00	0	-7,76E+02
PENRE	MJ	6,24E+03	9,12E+02	4,67E+00	0	0	0	0	0	0	0	0	1,36E+02	1,80E+03	0	-1,07E+04
PENRM	MJ	1,73E+03	0	-9,55E+00	0	0	0	0	0	0	0	0	0	-1,71E+03	0	0
PENRT	MJ	7,97E+03	9,12E+02	-4,88E+00	0	0	0	0	0	0	0	0	1,36E+02	8,91E+01	0	-1,07E+04
SM	kg	1,78E+00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	1,45E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m <sup>3</sup>	2,48E+00	1,33E-01	-2,91E-04	0	0	0	0	0	0	0	0	1,84E-02	2,33E-01	0	-2,92E+00
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

<sup>1</sup> This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO<sub>2</sub> is set to zero.

## Waste indicators

Results per functional or declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	8,81E+00	2,44E-02	3,64E-03	0	0	0	0	0	0	0	0	3,25E-03	6,84E+00	0	-1,25E-01
Non-hazardous waste disposed	kg	5,27E+02	8,76E+01	1,20E-01	0	0	0	0	0	0	0	0	8,07E+00	9,24E+00	0	-6,99E+01
Radioactive waste disposed	kg	3,17E-02	2,74E-04	6,34E-08	0	0	0	0	0	0	0	0	4,40E-05	2,98E-05	0	-2,32E-02

## Output flow indicators

Results per functional or declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	2,37E-01	0	2,17E+01	0	0	0	0	0	0	0	0	0	0	0	0
Materials for energy recovery	kg	1,67E+02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	1,22E+00	0	0	0	0	0	0	0	0	0	0	0	2,98E+02	0	1,40E+03
Exported energy, thermal	MJ	8,56E+00	0	0	0	0	0	0	0	0	0	0	0	1,19E+03	0	6,29E+03

## Other environmental performance indicators

No other environmental performance indicators.

## Additional environmental information

As they are raw products, plywood panels are not directly concerned by emissions of volatile pollutants into indoor air, as they are intended to be covered with an overlay and therefore will not be in direct contact with indoor air. However, tests on emissions of regulatory volatile pollutants were carried out to ISO 16000-9 standards on plywood panels at FCBA's ecotoxicology chemistry laboratory in 2011 (report 402/11/2719R/1 to 10). Test reports are available on request.

Regarding water and soil emissions, there is no harmful substances released during the use of the product.

## Additional social and economic information

No additional social and economic information declared.

## Information related to Sector EPD

### Covered manufacturers

Manufacturers covered with the present sector EPD belong to the organization 'UIPC', which is the French professional organization of plywood producers.

### Sample selection

To realise this sector EPD, data collection was realised on 9 production sites over 12 in total. These 9 production sites belong to the main plywood producers as data collection is representative of manufacturers corresponding to 99% of the total French plywood market share.

Data used in this sector EPD were averaged according to manufacturer's plywood production volumes.

### Declared product

The declared product is the average plywood from data collection, and it does not correspond to a product available for purchase on the market.

## Differences versus previous versions

No previous version for this EPD.

## References

General Programme Instructions of the International EPD<sup>®</sup> System. Version 4.0.

PCR 2019:14 Construction Products, version 1.3.2

c-PCR-006 Wood and wood-based products for use in construction (EN 16485).

Ecoinvent. 2024. Ecoinvent 3.10 database (cut-off).

EN 13986+A1:2015. Wood-based panels for construction - Characteristics, conformity assessment and marking

