Environmental product declaration (EPD)

As per **EN 15804+A1 and EN 15804/CN (french complement)**

Okoume-poplar and phenolic (PF) resin plywood panel, made in France, for multiple uses

Data for 1 m^2

Collective EPD

French verification program (INIES) registration number	2-110:2018
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Realised by

FCBA
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CODIFAB
comité professionnel de développement des industries françaises de l'ameublement et du bois

Initiated by

UIPC
Union des Industries du Panneau Contreplaqué

Reading guide

Abbreviations >

LCA > Life cycle assessment
ADP > Abiotic depletion potential
EPD > Environmental product declaration
FDES > French EPD
DTU > French "Unified Technical Documents"
PCR > Product category rules
FU > Functional unit
WIP > Waste incineration plant

General information

Manufacturer and information > Companies producing plywood panels in France corresponding to the description given below. A list of companies that can claim this french EPD is available from : UIPC - Union des industries du panneau contreplaqué : 23 rue du Départ, 75014, Paris, www.uipc-contreplaque.fr

Declared by > Institut technologique FCBA : 10 rue Galilée 77420 Champs-sur-Marne, www.fcba.fr

Produced by > Institut technologique FCBA : 10 rue Galilée 77420 Champs-sur-Marne, www.fcba.fr

EPD information > Collective EPD from 'cradle-to-grave' (modules A1 to C4 + D)

Verification > EPD verification according to EN ISO 14025:2010 :

☐ internal ☑ external

EPD third party verifier according to french program INIES : Etienne Lees-Perasso

Program > French program (INIES)
www.inies.fr

Issued > 11/10/2019

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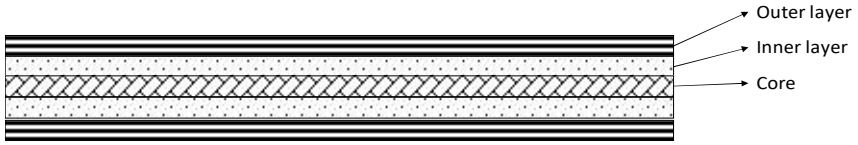
Warning on comparibility > EPD comparison is possible by ensuring that :

- both EPD are compliant with EN 15804+A1, and
- the same functional requirements as defined by the 2 EPD are met, and
- the environmental and technical performances of any assembled systems, components, or products excluded are the same, and
- the amounts of any material excluded are the same, and
- excluded processes or life cycle stages are the same, and
- the influence of the product systems on the operationnal aspects and impacts of the building are taken into account.

Product description

Name and identification > Okoume-poplar and phenolic (PF) resin plywood panel, made in France, for multiple uses

Visual representation >



Main components > Following table presents the main components of the installed product and the quantity by fonctional unit

Component	Material	Weight (kg / FU)	Volume (m³ / FU)
Wood	Wood (okoume-poplar)	6,4	0,015
Glue	Phenolic (pf) resin	1,3	0
TOTAL		7,7	0,015

Other characteristics > None.

Use > The product is used for multiple uses

Suitability for use > The plywood panel must comply with the following standards requirements :

- EN 636 - Plywood - Specifications,
- EN 13986+A1 - Wood-based panels for use in construction – Characteristics, evaluation of conformity and marking.

Reference service life > Following tables presents the reference service life (RSL) and the scenario on which it is based.

Parameter	Value
Reference service life (years)	50
Declared product properties (at the gate) and finishes, etc.	Plywood panel complies with the requirements of EN 636 + A1.
Theorical application parameters	Plywood panel application for multiple uses complies with technical requirements and rules of accepted practices.
Environment	Not applicable.
Usage conditions	Not applicable.
Maintenance	None

Content declaration > The product does not contain substances from the list of substances of very high concern that are candidates for authorization by the European Chemicals Agency.

Carbon storage > and biosourced content

The following information relates in particular to the storage of carbon are given as complementary environmental information.

Parameter	Unit	Value
Biogenic carbon content	kg CO_2 éq. / FU	10,5
Storage time	years	50
Contribution to climate change mitigation according to §7.6 of EN 16485	kg CO_2 éq. / FU	-4,5
Biosourced content	kg / FU	6,4

Manufacturing process > The main manufacturing stages of the product are: cutting, debarking, peeling, trimming, drying, sizing, pressing, edging and sanding.

Distribution and installation > Packaging materials are :

Packaging	Material	Mass (kg / FU)
Pallet	Wood	0,030
Cardboard	Carboard	0,002
Plastic	PE, PET	0,004
Strapping	Steel	0,006
TOTAL		0,041

The following loss rate was considered durint the installation in the bulding : 10%

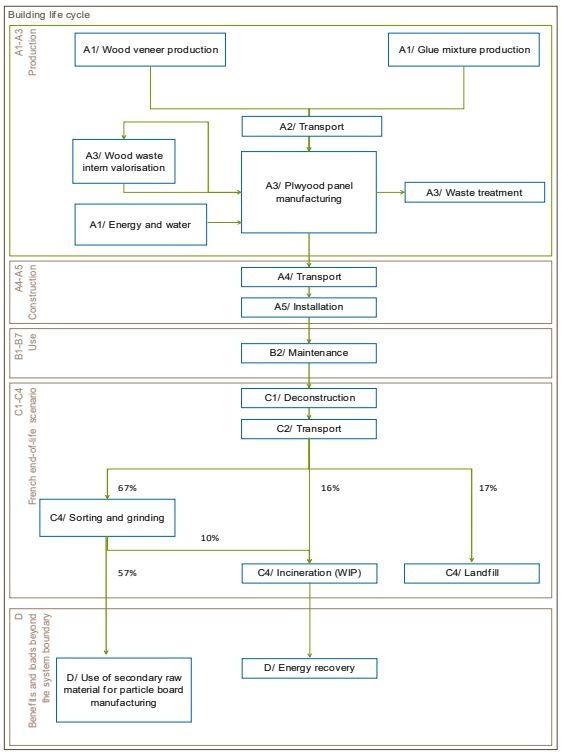
Representativity > and variability This collective EPD, representative of all plywood panels manufactured in France, within the list set by the validity framework on sensitive parameters (cf section at the end of the EPD). When this validity framework is respected, the results for the total life cycle do not exceed by more than 40% the declared values for the environmental aspects (global warming potential, use of non-renewable primary energy excluding non renewable primary energy resources used as raw materials, non hazardous wast disposed).

LCA rules

PCR > EN 15804+A1, EN 15804/CN (french complement) and EN 16485 are used as PCR.

Functional unit > Provide multiple uses function of 1 m² of surface using a plywood panel of okoume-poplar and phenolic (PF) resin during the lifetime of 50 years.

Process flow > diagram



Not considered stages > None.

Cut-off rules > All material and energy fluxes known to be capable of causing significant emissions to air, water or soil have been included. The unspecified raw materials in the life cycle inventory represent 0,001% of the reference flow and correspond to un-modeled flows occuring in some of the background data.

Allocations > Losses generated during manufacturing were accounted for as waste and 100% allocated to the product. In accordance with EN 16485, the energy and biogenic carbon contents have been allocated to reflect the physical flows.

Data quality > Primary data come from the average data collected on site (reference year 2016).
Secondary data come from ecoinvent database version 3 and the LCA database developed by FCBA (based on the report DHUP/CODIFAB/FBF/CSTB/FCBA 2012)

Environmental parameters from the LCA

		Product stage	Construction process stage			Use stage				
		Raw material supply, transport and manufacturing	Transport	Construction and installation process	Sub-total	Use	Maintenance	Repair	Replacement	Refurbishment
Parameters describing environmental impacts		**A1-A3**	**A4**	**A5**	**A4-A5**	**B1**	**B2**	**B3**	**B4**	**B5**
Global warming potential	kg CO_2 éq. / FU	-5,27	0,255	0,0918	0,347					
Depletion potential of the stratospheric ozone layer	kg CFC-11 éq. / FU	7,50 E-07	4,71 E-08	1,04 E-07	1,51 E-07					
Acidification potential of soil and water	kg SO_2 éq. / FU	0,0364	0,000861	0,00704	0,0079					
Eutrophication potential	kg PO_4^{3-} éq. / FU	0,00645	0,000159	0,0017	0,00186					
Formation potential of tropospheric ozone	kg éthène éq. / FU	0,00249	3,21 E-05	0,000494	0,000526					
Abiotic depletion potential (ADP-elements) for non fossil resources	kg Sb éq. / FU	1,43 E-06	6,04 E-10	1,27 E-06	1,27 E-06					
Abiotic depletion potential (ADP-elements) for fossil resources	MJ / FU	96,9	3,86	27,8	31,7					
Air pollution	m³ / FU	861	19,7	182	202					
Water pollution	m³ / FU	3,17	0,0763	1,2	1,28					
Parameters describing resource use										
Use of renewable primary energy exluding renewable primary energy resources used as raw materials	MJ / FU	80,3	0,0107	28,3	28,3					
Use of renewable primary energy resources used as raw materials	MJ / FU	107		0,465	0,465					
Total use of renewable primary energy resources	MJ / FU	188	0,0107	28,7	28,7					
Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials	MJ / FU	85,9	3,88	31,5	35,4					
Use of non renewable primary energy resources used as raw materials	MJ / FU	39,7		0,172	0,172					
Total use of non renewable primary energy resources	MJ / FU	126	3,88	31,7	35,6					
Use of secondary material	kg / FU	1,18 E-05		0,0193	0,0193					
Use of renewable secondary fuels	MJ / FU									
Use of non renewable secondary fuels	MJ / FU									
Net use of fresh water	m³ / FU	0,0148		0,0062	0,0062					
Parameters describing waste categories										
Hazardous waste disposed	kg / FU	0,0516	3,12 E-07	0,0377	0,0377					
Non hazardous waste disposed	kg / FU	0,405	0,00238	0,471	0,473					
Radioactive waste disposed	kg / FU	0,000571	2,67 E-05	7,63 E-05	0,000103					
Parameters describing output flow										
Components for re-use	kg / FU									
Materials for recycling	kg / FU	0,000576		0,444	0,444					
Materials for energy recovery	kg / FU	-3,11		-0,346	-0,346					
Materials for energy recovery (heat)	MJ / FU			0,59	0,59					
Materials for energy recovery (electricity)	kWh / FU			0,0852	0,0852					

		Use stage			End-of-life stage					Life cycle	Benefices and loads beyond the system boundary
		Operational energy use	Operational water use	Sub-total	Deconstruction, demolition	Transport	Waste processing	Disposal	Sub-total	Sub-total	Reuse, recovery and/or recycling
Parameters describing environmental impacts		**B6**	**B7**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**C1-C4**	**A-C**	**D**
Global warming potential	kg CO_2 éq. / FU					0,049	6,91	4,19	11,1	6,22	-2,38
Depletion potential of the stratospheric ozone layer	kg CFC-11 éq. / FU					7,56 E-09	8,48 E-09	8,48 E-09	2,45 E-08	9,26 E-07	-2,55 E-07
Acidification potential of soil and water	kg SO_2 éq. / FU					0,000275	0,000503	0,000601	0,00138	0,0457	-0,00586
Eutrophication potential	kg PO_4^{3-} éq. / FU					6,16 E-05	0,000106	0,000161	0,000328	0,00864	-7,14 E-05
Formation potential of tropospheric ozone	kg éthène éq. / FU					7,93 E-06	1,41 E-05	0,000185	0,000207	0,00323	-0,000296
Abiotic depletion potential (ADP-elements) for non fossil resources	kg Sb éq. / FU					5,21 E-08	8,05 E-08	5,93 E-08	1,92 E-07	2,89 E-06	-3,74 E-07
Abiotic depletion potential (ADP-elements) for fossil resources	MJ / FU					0,727	1,03	0,575	2,33	131	-34,8
Air pollution	m³ / FU					3,58	8,37	22,9	34,8	1 100	-36,2
Water pollution	m³ / FU					0,0159	0,0313	0,0329	0,0801	4,53	-0,223
Parameters describing resource use											
Use of renewable primary energy exluding renewable primary energy resources used as raw materials	MJ / FU					0,0047	-8,6	0,0107	-8,58	100	16
Use of renewable primary energy resources used as raw materials	MJ / FU						-60,9		-60,9	47	
Total use of renewable primary energy resources	MJ / FU					0,0047	-69,5	0,0107	-69,5	147	16
Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials	MJ / FU					0,75	23,6	0,64	25	146	-45,3
Use of non renewable primary energy resources used as raw materials	MJ / FU						-22,6		-22,6	17,4	
Total use of non renewable primary energy resources	MJ / FU					0,75	1,06	0,64	2,45	164	-45,3
Use of secondary material	kg / FU									0,0193	
Use of renewable secondary fuels	MJ / FU										
Use of non renewable secondary fuels	MJ / FU										
Net use of fresh water	m³ / FU					0,000107	0,000132	0,00226	0,0025	0,0235	-0,00669
Parameters describing waste categories											
Hazardous waste disposed	kg / FU					0,000256	0,00128	0,0268	0,0284	0,118	-0,017
Non hazardous waste disposed	kg / FU					0,00276	0,00325	1,58	1,58	2,46	-0,262
Radioactive waste disposed	kg / FU					3,00 E-07	4,21 E-07	2,52 E-06	3,24 E-06	0,000677	-0,000149
Paramètres décrivant les flux sortants											
Components for re-use	kg / FU										
Materials for recycling	kg / FU						4,53	0,889	5,42	5,86	0,129
Materials for energy recovery	kg / FU									-3,46	
Materials for energy recovery (heat)	MJ / FU							6,03	6,03	6,62	
Materials for energy recovery (electricity)	kWh / FU							0,871	0,871	0,957	

Scenarios and additionnal technical information

Stage		Parameter	Value
Product stage	**A1-A3** Raw material, transport and manufacturing	Wood specie(s)	Okoume-Poplar
		Glue type	phenolic (PF) resin
		Weight of glue	1,3 kg/FU
		Panel thickness	15 mm
		Volumic mass	7,7 kg/FU
Construction process stage	**A4** Transport	Vehicle and fuel used	Semi-trailer truck with fuel consumption : - full load : 0,43 l / km, - empty load : 0,26 l / km.
		Distance	500 km by truck
		Use of capacity (including empty returns)	Loading rate : 88% Empty rate : 15%
		Transported weight by truck	24 t
	A5 Installation	Ancillary materials	Steel : 0,018 kg / FU and wood : 0,95 kg / FU
		Water use	None
		Other resource use	None
		Energy consumption	None
		On-site waste before processing	Plywood panel : 0,77 kg / FU Packaging waste : 0,04 kg / FU
		Output materials as result of waste processing at building site	0,52 kg / FU for recycling, 0,12 kg / FU to incineration, 0,13 kg / FU to landfill.
		Direct emissions to ambient air, soil and water	Not applicable
Use stage information modules related to the building fabric	**B2** Maintenance	Maintenance process	None
		Maintenance cycle	None
		Ancillary materials	None
		Waste material	None
		Net fresh water consumption	None
		Energy input	None
	B3 Repair	Repair process	None
		Inspection process	None
		Repair cycle	None
		Ancillary materials	None
		Waste material	None
		Net fresh water consumption	None
		Energy input	None
	B4 Replacement	Replacement cycle	None
		Energy input	None
		Exchange of worn parts	None
	B5 Refurbishment	Refurbishment process	None
		Refurbishment cycle	None
		Energy input	None
		Material input	None
		Waste material	None
		Further assumptions for scenario development	Not applicable
Use stage information modules related to the operation of the building	**B6 - B7** Use of energy Use of water	Ancillary materials	None
		Net fresh water consumption	None
		Type of energy carrier	None
		Power output of equipment	Not applicable
		Characteristic performance	Not applicable
		Further assumptions for scenario development	Not applicable

Stage		Parameter		Value
End-of-life stage	**C**	End-of-life scenario		The end-of-life is based on the average french end-of-life scenario for construction wood waste : 67% of wood waste reach a sorting platform (with subsequent recycling of wood into wood particle board and incineration of grinding 'dust'), 16% are incinerated with energy recovery, 17% are landfilled. This scenario is described in the following report : FCBA CSTB DHUP CODIFAB FBF, Convention DHUP CSTB 2009 Action 33 Sous-action 6 – ACV & DEP pour des produits et composants de la construction bois – Volet 2 Prise en compte de la fin de vie des produits bois – Phase 3 Modélisation ACV et calculs d'impacts pour le recyclage matière et la réutilisation, 2012.
		Collection proces	Collected separately	5,2 kg / FU
			Collected with mixed construction waste	2,5 kg / FU
		Recovery system	Reuse	None
			Recycling	5,2 kg / FU
			Energy recovery	None
		Disposal	Incineration	1,2 kg / FU
			Landfill	1,3 kg / FU
Reuse, recovery and/or recycling potential	**D**	Stage description		According to appendix H of the EN 15804/CN (french complement), the benefits and loads beyond the system's boundaries include : - at recycling level, transport and transformation of wood chips as secondary raw material for wood particle board manufacturing, and substitution of virgin raw material (forestry, logging, transport, grinding, drying), - at incineration level, substitution of recovered thermal and electrical energy. The different processes are described in the report quoted above.

Emissions of hazardous substances to indoor air, soil and water during use stage

Stage			Parameter	Value
Use stage related to the building fabric	**B1** Use of the installed product in terms of emissions in the environment	Emissions to indoor air	Regulatory emissions of volatile pollutants in indoor air according to the french decree of 19 April 2011	Test on emissions of regulatory volatile pollutants wre carried out, according to the ISO 16000-9 standards, on plywood panel, at the FCBA ecotoxicology-chemistry laboratory in 2011. (report 402/11/2719R/1à10). Reports are available on request.
			Other emissions of volatile pollutants in indoor air	No test have been performed
			Natural radioactive emissions	No test have been performed
			Other information on the sanitary quality of indoor spaces	-
		Emissions to water	Water for human consumption	Not applicable because this product is not in contact ith water for human consumption.
			Runoff, seepage, surface water or groundwater	Not applicable because this product is not in contact with runoff, seepage water, surface water or groundwater.
		Emissions to soil		No test have been performed

Contribution of the product to the quality of life inside building

Stage			Parameter	Value
Use stage related to the building fabric	**B1** Use of the installed product in terms of emissions in the environment	Quality of life	Hygrothermal comfort	Not applicable
			Acoustic comfort	Not applicable
			Visual comfort	Not applicable
			Olfactory comfort	Not applicable
			Other information on comfort	Not applicable

Validity framework

According to appendix L of the EN 15804/CN (french complement), a validity framework was established based on the gravity and sensitivity analysis on parameters for the following environmental indicators : global warming potential, use of non-renewable primary energy excluding non-renewable primary energy resources uses as raw materials, non hazardous waste disposed.
When this validity framework is respected, the results for the total life cycle do not exceed by more than 40% the declared values for the environmental indicators below.
A product meets this validity framework if the following criteria are met on sensitive parameters.

Stage		Parameter	Value
Production	A1 - A3 Raw material, transport and manufacturing	Place of manufacture of the panel	France
		Panel thickness	Panel thickness should be less than or equal to 22 mm