

ENVIRONMENTAL PRODUCT DECLARATION



1. Declaration of general information

1.1 Manufacturer information

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1.2 Description of the construction product's use and declared unit

Due to the great variability of products and due to the fact that product-specific data is confidential information, it was decided to model the weighted **average product** of all panels produced in the MDF plant: This average product is uncoated.

The declared unit of this LCA is 1 m³ of average medium density fiberboard, produced by dry process under Walloon conditions in 2011, at plant gate. The scope of the assessment is A1 to A3.

1.3 Product identification

It concerns a mixture of raw MDF boards (standard, water resistant and/or fire resistant). They are all panel-shaped materials according to EN 622-5. These boards are divided into different board types – a description of the classes can be found in the EN 622-5 requirements.

The board types are primarily divided based on their application as load-bearing (CE marking) or non-load-bearing elements in dry and humid areas. The following types are comprised within the average fiberboard at Spanolux (Codes added following classification by EN 316):

- general-purpose boards for use in dry conditions - MDF
- load-bearing boards for use in dry conditions – MDF LA
- load-bearing boards for use in humid conditions – MDF HLS
- load-bearing boards Fire Retardant for use in dry conditions – MDF LA FR
- lightweight MDF for use in dry conditions – L MDF
- lightweight MDF Fire Retardant for use in dry conditions – L MDF FR
- lightweight MDF for use in humid conditions – L MDF H
- ultra-lightweight MDF for use in dry conditions - UL2 MDF
- rigid underlays in roofs and walls - MDF.RWH

More information see paragraph 3.3.

1.4 Product components / materials

The declared unit is 1 m³ of average medium density fibreboard, uncoated, produced by dry process under Walloon conditions in 2011, at plant gate. The calculated density of this average MDF is 695.3 kg/m³ panel (with 5.5 % water) or 657.1 kg/m³ panel (dry mass).

The standard board dimensions are 1.22 x 3.05 m and 1.22 x 2.44 m, but in principle, all lengths and widths are available within the press capabilities and can be produced upon request:

- Width from 2.25 to 2.56 m
- Length from 3.66 to 6.31 m
- Thickness from 6 to 40 mm

Table 1 shows the composition of 1 m³ average MDF.

Component	Value	Percentage
Wood (Carbon)	566.3 kg/m ³ panel 283.2 kg/m ³ panel	81.4 % 50 %
Resin	80.5 kg/m ³ panel	11.6 %
Other additives	10.3 kg/m ³ panel	1.5 %
Water	38.2 kg/m ³ panel	5.5 %
Total	695.3 kg/m³panel	100 %

1.5 Execution of the EPD

The EPD has been prepared by Vanessa Zeller (Université Libre de Bruxelles) in cooperation with Belgian Institute for Wood Technology. Software used: SimaPro 8.0.3, PRé Consultants bv 2014

Program owner: Spanolux S.A.

1.6 Validity

The EPD has been issued on 19/06/2015 and valid for 5 years.

1.7 Life cycle stages considered

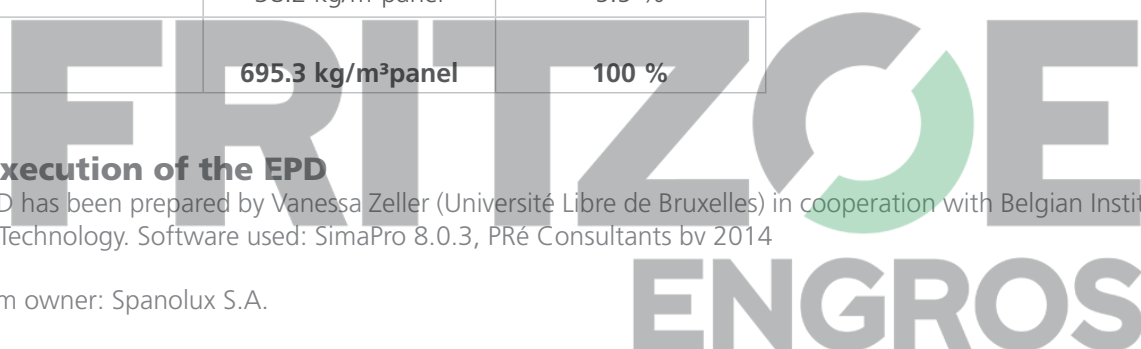
This EPD concerns the product phase (A1-A3).

1.8 About the EPD

EPD of construction products may not be comparable if they do not comply with the standard EN 15804/ EN 16485.

1.9 Average environmental performance

As the declared unit is 1 m³ of average medium density fibreboard, this EPD represents the average environmental performance. The environmental performance for each board type varies with respect to density and chemical composition of the board. The 'high density MDF' requires more energy for its production while the 'light MDF' requires less energy compared to the average MDF. The 'fire retardant MDF' will show higher environmental impacts through a relatively higher content of additives. The 'no added formaldehyde resin MDF' will show less environmental impacts than the average board due to lower resin content.




1.10 Manufacturer: see 1.1

1.11 Substances of very high concern for authorisation

No substances of very high concern are used in the production process.

1.12 Practical information: <http://www.spanolux.com/en>

Demonstration of verification	
CEN standard EN 15804 (EN 16485) serves as the core Product Category Rules	
Independent verification of the declaration and data, according to EN ISO 14025:2010	
internal	external
<input type="checkbox"/> Third party verifier:  Frank Werner Environment and development www.frankwerner.ch	

2. Declaration of environmental parameters from Ica

2.1 Process

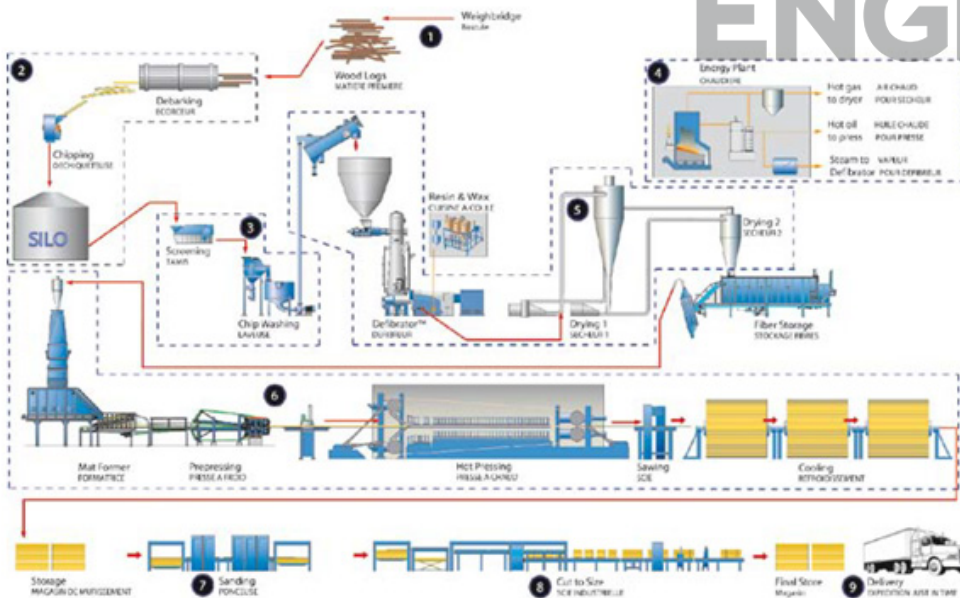


Figure 1 : MDF production process

Model:

The unit processes that have been modelled for the MDF production system are presented in Figure 2. The product system consists of various processes that take place outside the MDF production facility (background system with upstream processes e.g. raw material production) and processes that occur directly in the MDF production plant (foreground system). The on-site processes correspond to the processes illustrated in Figure 1, but they are slightly adapted (more aggregated) in the model. Energy consumption related to building operation like lighting is distributed evenly on all unit processes that occur in the factory.

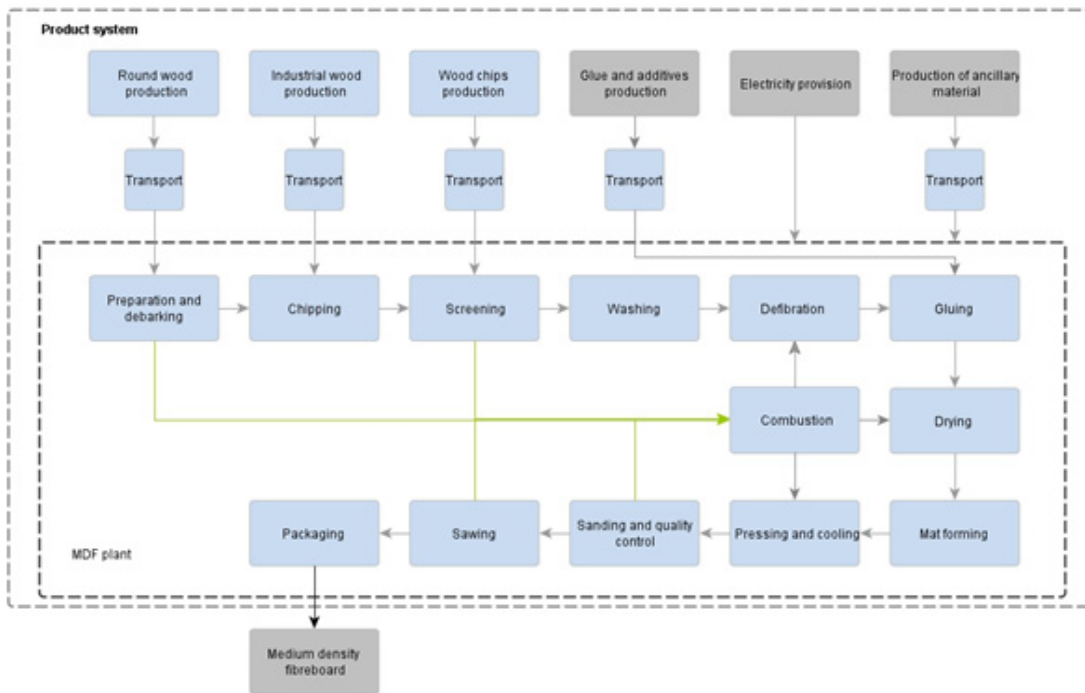


Figure 2 : Flow chart of the product system of MDF

2.2 Spanolux Wood declaration:

- To the best of our knowledge, the wood does not originate from “controversial” sources nor do the wood based products contain any raw material that can be considered as “controversial”, i.e.
- Not complying with local, national or international legislation, in particular related to the following areas:
 - * forestry operations and harvesting, including conversion of forest to other use,
 - * management of areas with designated high environmental and cultural values,
 - * protected and endangered species, including requirements of CITES,
 - * health and labour issues relating to forest workers,
 - * indigenous peoples’ property, tenure and use rights,
 - * payment of taxes and royalties.
- Not follow the laws of the exploitation country in relation to trade and customs, in so far as the forest sector is concerned
- Utilising genetically modified organisms
- Converting forest to other vegetation type, including conversion of primary forests to forest plantations.
- Our wood supplies are conform to the EUTR (EU Timber Regulation) following rules (UE) n°995/2010.
- **Spanolux is certified to following Chain of Custody (CoC) management systems**
 - * FSC: SGSCH-COC-000330
 - * FSC CW: SGSCH-CW-000330
 - * PEFC: CTIB-TCHN 0304

2.3 Type of EPD

This EPD is a Cradle to Gate EPD

2.4 Parameters describing environmental impacts

Table 2: Parameters describing environmental impacts

Impact category	Value	Unit (per m ³ MDF)
Global warming*	-280.68	kg CO2 equiv.
Ozone depletion	5.53E-05	kg CFC 11 equiv.
Acidification	1.70	kg SO2 equiv.
Eutrophication	0.30	kg (PO4) ³⁻ equiv.
Ozone creation	0.20	kg Ethene equiv.
Abiotic depletion (elements)	145.62E-05	kg Sb equiv.
Abiotic depletion (fuels)	8,129.07	MJ

*The result for global warming potential is 445.03 kg CO2 equiv./m³ when taking into account only fossil greenhouse gas emissions. The biogenic balance shows biogenic CO2 emissions of 416.22 kg CO2 equiv./m³ (mainly from the biomass heating plant) and an uptake of 1,141.93 kg CO2 equiv./m³ (counted as negative CO2 emission).

2.5 Parameters describing resource use

Table 3: Parameters describing resource use

Parameter	Value	Unit (per m ³ MDF)
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	4,329.50	MJ
Use of renewable primary energy resources used as raw materials	10,932.65	MJ
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	15,262.15	MJ
Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials	6,670.96	MJ
Use of non renewable primary energy resources used as raw materials	4,176.13	MJ
Total use of non renewable primary energy resources (primary energy and primary energy resources used as raw materials)	10,847.09	MJ
Use of secondary material	0.24	kg
Use of renewable secondary fuels	0	MJ
Use of non renewable secondary fuels	0.41	MJ
Use of net fresh water	7.57	m ³

Note: MJ address the net calorific value

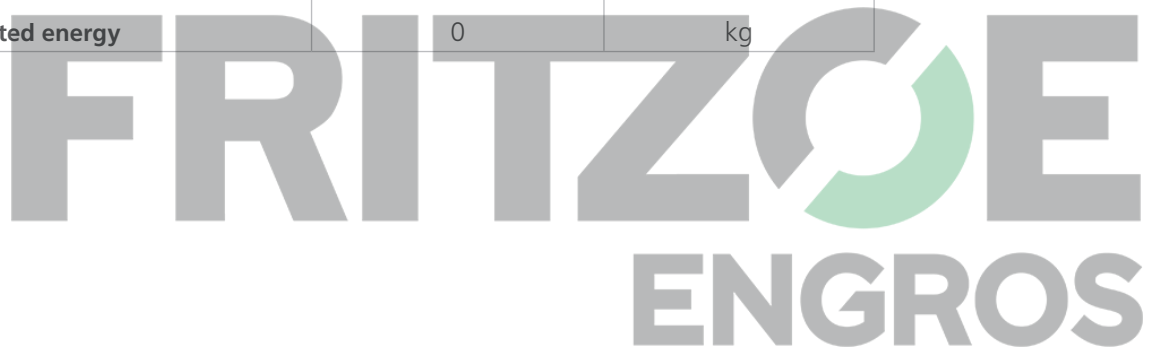
2.6 Other environmental information

Table 4: Other environmental information describing waste categories for 1 m³ MDF

Parameter	Value	Unit (per m ³ MDF)
Hazardous waste disposed	0.01	kg
Non-hazardous waste disposed	39.17	kg
Radioactive waste disposed	0.03	kg

Table 5: Other environmental information describing output flows

Parameter	Value	Unit (per m ³ MDF)
Components for re-use	0	kg
Materials for recycling	0	kg
Materials for energy recovery	0	kg
Exported energy	0	kg



3. Additional technical information

This EPD is a cradle to gate EPD, so calculations are made for the product stage A1-A3. Anyhow, some additional technical information is given, without calculating the environmental performance.

3.1 Emissions to indoor air during use phase

The panels produced by the enterprise are tested on the emission of formaldehyde to indoor air, according to two testing schemes.

Table 6: Formaldehyde emissions according to EN 120

Testing Institute	WKI Fraunhofer Wilhelm-Klauditz-Institut , Braunschweig, Germany and CTIB-TCHN, Brussels, Belgium Testing, monitoring, and certification site
Test report	2 reports per year
Result	The testing of the formaldehyde content was performed according to the perforator method according to EN 120. For the raw boards the results are well below the maximum permissible value of 8 mg /100 g (at 6.5% material moisture content). The average results are 6 mg HCHO/100 g according to EN 120 for the 8 different grade/ thickness boards tested on 2nd semester 2013

Table 7: Formaldehyde emissions according to (C)ARB

Testing Institute	CTIB-TCHN, Brussels, Belgium Testing, monitoring, and certification site
Test report	4 reports per year
Result	The testing of the formaldehyde content was performed according to the chamber method ASTM E 1333. For the raw boards the results are below the maximum permissible value of 0.11 ppm. The average result is 0.08 ppm for the 3 different grade/thickness boards tested in 4th quarter 2013.

3.2 End-of-life potential scenarios

At the end of the utilization phase of a building, MDF and HDF panels can be separated and used again for the same applications (i.e. remodeling), if selective deconstruction is practiced. However, this is seldom applied in current building practice in Belgium. The MDF and HDF boards and leftovers originating from the construction site as well as those from deconstruction measures shall be used for energy utilization rather than being placed in the landfill (refuse code according to European Waste Catalogue: 170201/030103).

3.3 Additional information: product standard and approval

The following standards apply on the production of MDF and fall under the factory production control for quality assurance.

- EN 622-5: Fibreboards - Specifications - Part 5: Requirements for dry process boards (MDF);
- EN 13986: Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking;
- EN 316: Wood fibre boards - Definition, classification and symbols;
- EN 12369-1: Wood-based panels - Characteristic values for structural design - Part 1: OSB, particleboards and fibreboards;
- EN 622-1: Fibreboards - Specifications - Part 1: General requirements;
- EN 14322: Wood-based panels - Melamine faced boards for interior uses - Definition, requirements and classification;
- EN 12871: Wood-based panels - Determination of performance characteristics for load bearing panels for use in floors, roofs and walls.

Within the quality control of the company, following labelling, attestation and certification applies:

- CE-labelling according to EN 13986 – Notified Body CTIB-TCHN
 - * Fiberboard Firax MDF LA E1-FR B-s1-d0 (12-30 mm) Spanolux sa 1161-CPD-0190
 - * Fiberboard S-Lux MDF.LA E1 Spanolux sa (6-30mm)1161-CPD-0142
 - * Fiberboard Firax L L-MDF E1-FR B-s1-d0 (15-25 mm) Spanolux sa1161-CPD-0189
 - * Fiberboard Umidax MDF.HLS E1 Spanolux sa 1161-CPD-0141
 - * Fiberboard Firax class C MDF LA-FR C-s2-d0 (12-25 mm) Spanolux sa 1161-CPD-1187
 - * Fiberboard Firax MDF LA E1-FR B-s2-d0 (6-11,9 mm) Spanolux sa 1161-CPD-1221
 - * Fiberboard Firax L L-MDF E1-FR B-s2-d0 (12-14.9 mm) Spanolux sa 1161-CPD-1223
 - * Fiberboard Firax L Class C L-MDF E1-FR C-s2-d0 (12-25 mm) Spanolux sa 1161-CPD-1328
- PEFC, Chain of Custody - CTIB-TCHN 0304
- FSC Chain of Custody - SGSCH-COC-000330
- FSC Controlled Wood - SGSCH-CW-000330
- CARB certification
 - * MDF Fibrabel 8-40 mm | MDF Fibrabel L 12-40 mm Spanolux sa CTIB-TCHN 1185
 - * MDF LA 6-30 mm Spanolux sa CTIB-TCHN 1254
 - * L MDF-H 6-38 mm | MDF-HLS 6-38 mm Spanolux sa CTIB-TCHN 1276
- ISO 9001:2008 SGS certificate n° BE 05/051202.01
- ISO 14001:2004 SGS certificate n° BE 08/0950921.01
- HSAS 18001:2007 SGS certificate n° BE08/950922.01

Additional performances:

Classification according to flammability rating B or C according to EN 13501-1 (see EN 13986 requirement), Smoke development class S1 and S2 (normally smoky), d0 – non-dropping (See also CE certificates). Dripping by combustion is not possible, since the MDF and HDF boards do not liquefy when hot.

No component materials which could be hazardous to water are washed out.

The relatively brittle breaking pattern of MDF and HDF boards points to the risk of sharp breaking edges (risk of injury).