TAFISA®

Particleboards and Decorative Panels (TFL)

Tafisa Canada Inc.

ENVIRONMENTAL PRODUCT DECLARATION

ISO 14025:2006

Tafisa Canada Inc. is pleased to present this environmental product declaration (EPD) for their Particleboards and Decorative Panels (TFL). This EPD was developed in compliance with ISO 14025 and has been verified by Jean-François Ménard, (CIRAIG). The LCA and the EPD were prepared by Vertima Inc. The EPD includes cradle-to-gate life cycle assessment (LCA) results.

For more information about Tafisa Canada Inc., visit www.tafisa.ca/en
For any explanatory material regarding this EPD, please contact the program operator.

Environmental Product Declaration

CSA Group Registered
Based on ISO 14025
and Other Requirements
For more information visit
csaregistries.ca/epd

#1491-5377
Mar 2022 - 2027

1 General Information

PCR GENERAL INFORMATION			
Reference PCR	ULE General Program Instructions v2.3 February 2018 PCR for Building-Related Products and Services in Part A: Life Cycle Assessment Calculation Rules and Report Requirements, Version 3.2 and Part B: Structural and Architectural Wood Products EPD Requirements, Version 1.0. (UL Environment, December 2018 to December 2023).		
The PCR review was conducted by:	*Dr. Thomas Gloria (Chair)* *Industrial Ecology Consultants*	*Dr. Indro Ganguly* *University of Washington*	*Dr. Sahoo* *University of Georgia*

EPD GENERAL INFORMATION		
Program Operator	CSA Group 178 Rexdale Blvd, Toronto, Ontario, Canada M9W 1R3 www.csagroup.org	
Declared Products	**Particleboards and Decorative Panels (TFL)**	
EPD Registration Number 1491-5377	**EPD Date of Issue** 2022/03	**EPD Period of Validity**[1] 2022/03 - 2027/03
EPD Recipient Organization	Tafisa Canada Inc. 4660 rue Villeneuve, Lac-Mégantic Quebec, JG6B 2C3 Canada www.tafisa.ca/en	TAFISA®
EPD Type/Scope and Declared Unit Product specific type III, cradle-to-gate EPD with declared unit of 1 m^3 of Particleboards and Decorative panels (TFL) produced.		**Year of Reported Manufacturer Primary Data** 2019
LCA Software Open LCA v.1.10.3	**LCI Databases** ecoinvent 3.7, US LCI	**LCIA Methodology** TRACI 2.1- IPCC 2013

This LCA and EPD were prepared by:	Gatien Geraud Essoua Essoua Ph.D., Eng. Forestry. Vertima Inc. www.vertima.ca
This EPD and LCA were independently verified in accordance with ISO 14025:2006, ISO14044:2006, ISO 14044:2006 as well as the UL Environment "Part A: Life Cycle Assessment Calculation Rules and Report Requirements" v3.2 (December 2018), which is based on ISO 21930:2017 and CEN Standard EN 15804 (2012), PCR, Part B: Structural and Architectural Wood Products EPD Requirements, Version 1.0, serves as the core PCR. ☐ Internal ☒ External	Jean-François Ménard ____________________ Jean-François Ménard

1. 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 with a program operator.

LIMITATIONS

This declaration is an environmental product declaration in accordance with ISO 14025 that describes environmental characteristics of the described product and provides transparency and disclosure of environmental impacts [1]. This EPD does not guarantee that any performance benchmarks, including environmental performance benchmarks, are met.

Environmental declarations within the same product category but from different programs may not be comparable. Only EPDs prepared from cradle-to-grave life cycle results and based on the same function, reference service life (RSL), and quantified by the same functional unit can be used to assist purchasers and users in making informed comparisons between products. EPDs based on cradle-to-gate information modules shall not be used for comparisons unless using a functional unit and complying with all of the requirements set out in ISO 14025, Section 6.7.2. EPDs based on a declared unit shall not be used for comparisons.

2. PRODUCT SYSTEM DESCRIPTION

Tafisa® has firmly established itself as an industry leader. Tafisa® conforms to the most stringent environmental standards and is an industry leader in recycling and sustainable development. 100% of wood fibers used by Tafisa® in its panel manufacturing process come from pre-consumer and post-consumer wood material. Tafisa® is certified Forest Stewardship Council MIX (FSC® MIX) by Rainforest Alliance, for its chain of custody and controlled timber and an Eco-Certified Composite™ (ECC) by the Composite Panel Association (CPA).

2.1. PRODUCT DESCRIPTION

The products analyzed in this report are Particleboard (PB) and Decorative Panels (TFL). Tafisa® particle board panels are manufactured using 21% recycled wood materials, meticulously selected to create high-quality, consistent panels for furniture, millwork, cabinetry, and countertops. Tafisa® offers two types of particleboard panels: TAFIPAN® and TAFIPAN-EVOLO™. TAFIPAN is certified EPA TSCA Title VI-compliant with formaldehyde emissions below 0.09 ppm, while TAFIPAN-EVOLO™ is certified Ultra Low Emitting Formaldehyde (ULEF) by the California Air Resources Board (CARB), with formaldehyde emissions below 0.05 ppm.

They are different grades of Tafisa particleboard (Evolo, M2, P2, MF, LD, M3, MS). They cover a range of densities, with an average of 705.19 kg/m^3 and 693.05 kg/m^3 and thicknesses with an average of 19.32 mm and 18.05 mm. They are manufactured in various dimensions (width x length) between 4’x8’ and 5’x12’. Tafisa particleboard is used for the production of furniture, millwork, cabinetry, and countertops. Tafisa® Canada's decorative panels (TFL) use particleboard as substrate. To obtain TFL panels, particleboard surfaces are covered with Tafisa decorative paper layer. Decorative paper is a melamine resin impregnated paper manufactured by different suppliers. TFL panels are available in more than 122 standard colour and texture combinations. As a result, the product range is one of the most comprehensive product lines in the industry.

Figure 1 shows the room scene of Tafisa® particleboard panels. The primary United Nations Standard Products and Services Code (UNSPSC) code for these Tafisa panels is 11122002 and the Construction Specifications Institute (CSI) code is 06 42 00.

Figure 1: Room scene of Tafisa® particleboard panels.

2.1.1. Product specification

Tafisa respects the following standards for each of their products analyzed in this study:

- ANSI A208.1-2016, American National Standard for Particleboard
- CAN/ULC S102- 10 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- CAN/CSA 0160-16, Formaldehyde Emissions Standard for Composite Wood Products.
- EPA TSCA Title VI, Formaldehyde Emissions Standards for Composite Wood Products
- ASTM E84– 21 Standard Test Method for Surface Burning Characteristics of Building Materials.
- BIFMA HCF 8.1-2019, Health Care Furniture Design – Guidelines for Cleanability.
- JIS Z 2801: 2012, Antimicrobial Activity of Hard Non-Porous Surfaces.
- CARB ATCM 93120, Airborne Toxic Control Measure for Formaldehyde Emissions from Composite Wood Products.
- NEMA Ld-3 2005, High-Pressure Decorative Laminates (HPDL).
- EN 438-2, High-Pressure Decorative Laminates (HPL) - Part 2: Determination of properties.

2.1.2. Technical requirements

Table 1 presents the technical requirements for the products under study. For specific properties and performance data concerning Tafisa particleboards and decorative panels, please consult the following link: **https://tafisa.ca/sites/default/files/2021-07/Brochure_Tafisa_2021-2022_0.pdf**

Table 1: Technical data for products under study.

Items	Units	Particleboards	Decorative Panels
Average Thickness	mm	19.32	18.05
Average Width	mm	1,397.00	1,397.00
Average Density	kg/m^3	705.19	693.05

2.2. MATERIAL COMPOSITION

The weighted average profile of each m^3 of particleboard and TFL panel manufacturing is calculated based on 2019 annual production data. These represent the inputs to produce 1 m^3 including press losses and faulty panels used as packaging. A summary of the values compiled are presented in Table 2.

Table 2: Materials composition of one m^3 of Particleboards and Decorative Panels.

Materials	Particleboards		Decorative Panels	
	Amount (kg)	Ratio (%)	Amount (kg)	Ratio (%)
Wood	6.17E+02	87.43%	5.96E+02	86.02%
Adhesive	6.80E+01	9.64%	6.64E+01	9.59%
Catalyst	4.02E+00	0.57%	3.88E+00	0.56%
Water	1.40E+01	1.98%	1.45E+01	2.09%
Wax	2.66E+00	0.38%	2.45E+00	0.35%
Impregnated Decorative Paper	0.00E+00	0.00%	9.65E+00	1.39%

2.3. PRODUCT APPLICATION

Tafisa particleboard is used for furniture, millwork, cabinetry, and countertop manufacturing. Decorative panels are ideal for furniture, bathroom, and kitchen furnishings, doors of all kinds, storage systems, wall/ceiling cladding, and more. Tafisa particleboard is also designed for use in residential and commercial furniture and recommended for vertical and horizontal applications with moderate impact and moderate use.

2.4. MANUFACTURING

Manufacturing Tafisa panels is a nine-step process: material wood crushing, drying, blending, mat forming, pressing and curing, finishing (cooling, trimming and sanding), packaging or lamination, and packaging for TFL product. Figure 2 presents the flow diagram of Tafisa panels.

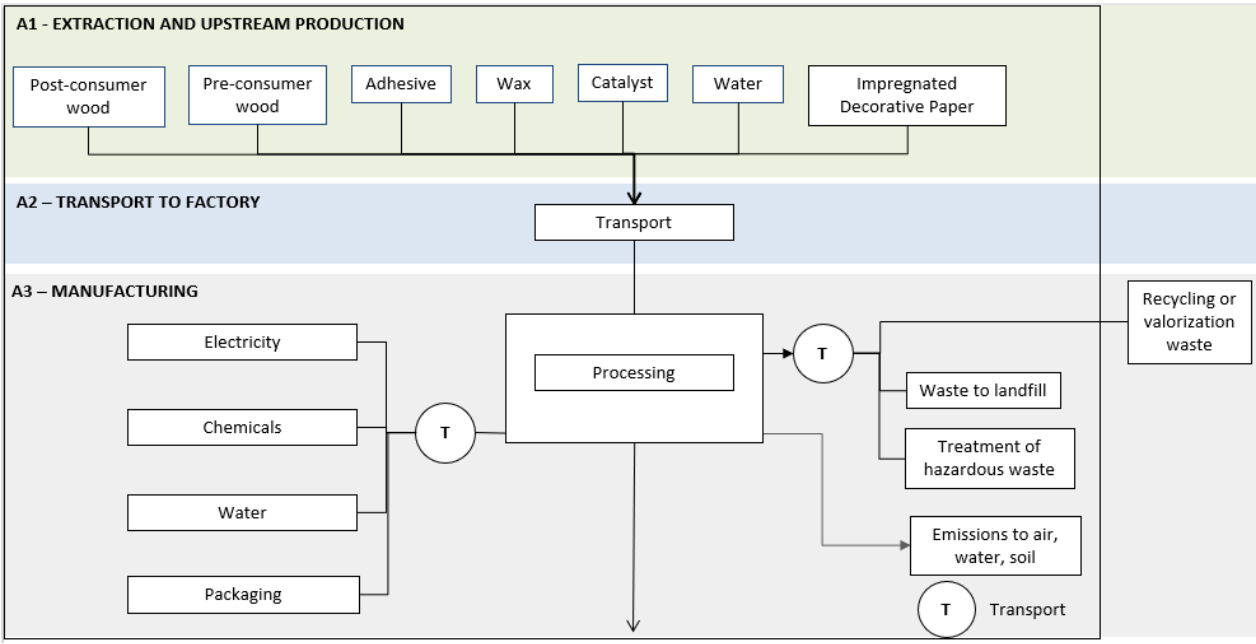

Figure 2: Production process flow diagram for Tafisa panels.

3. LCA CALCULATION RULES

3.1. DECLARED UNIT

The selected declared unit (DU) for this study according to the UL PCR [2] is 1 m^3 of Tafisa panel. **Table 3** presents all products targeted by this report and their respective DU.

Table 3: Declared Unit of panels under study.

Items	Units	Particleboards	Decorative Panels
Declared Unit	m^3	1	1
Average Mass	kg	7.05E+02	6.93E+02
Average Thickness	mm	19.32	18.05
Average Density	kg/m^3	7.05E+02	6.93E+02
Moisture Content (based on dry mass)	%	4-6	4-6

3.2. SYSTEM BOUNDARIES

According to UL Environment's PCR **[3]**, the system boundaries are cradle-to-gate. The life cycle stage included in the analysis is the production stage, which includes A1) Extraction and upstream production, A2) Raw materials transportation to the manufacturing plant and A3) Manufacturing of Tafisa panels.

Table 4 presents the product life cycle stage and its modules included in the system boundaries analyzed in accordance with ISO 21930 **[4]**.

Table 4: Description of the system boundary life cycle stages and related information modules

PRODUCTION STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END-OF-LIFE STAGE			
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
Extraction and upstream production	Transport	Manufacturing	Transport from gate to site	Assembly/ Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction	Transport	Waste Processing	Disposal
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Key: X = included; MND = module not declared (excluded)

3.3. ALLOCATION REFERENCE SERVICE LIFE AND ESTIMATED BUILDING SERVICE LIFE

Not applicable as this EPD does not include the use stage in the life cycle of Tafisa panels.

For information purposes, according to the part A of the PCR, the estimated service life (ESL) of the building is assumed to be 75 years. Tafisa panels have no reference service life (RSL). Based on the ISO 21930, section 7.1.4 [4], it can be assumed that RSL of Tafisa panels correspond to the ESL of the building [3].

3.4. ALLOCATION

The ISO 14040 allocation procedure states that, whenever possible, allocation should be avoided by collecting data related to the process under study or by expanding the product system [5].

According to the PCR Part B and section 3.5 allocation rules, mass should be used as the primary basis co-product allocation, and UL PCR Part A specifies only when the difference in revenue from the co-products is low. Based on information provided by the manufacturer, the difference in market value ($) between both co-products is higher (more than 25%). In this study, economic allocation was used for input and output flows. Allocation was performed on the basis of the yearly production volume of each co-product under study. Data relative to material and energy consumption were provided for the whole site and for all Tafisa Canada co-products.

3.5. CUT-OFF METHODOLOGY

According to the UL Environment PCR – Part A [3], if a mass flow or energy flow represents less than 1% of the cumulative mass or energy flow of the system, it may be excluded from the system boundaries. However, these flows should not have a relevant environmental impact. In addition, at least 95% of the energy usage and mass flow must be included. Cumulative material inputs and environmental impacts less than 5% of the total weight of the DU are excluded.

3.6. DATA SOURCES AND QUALITY REQUIREMENTS

Data Quality Parameter	Data Quality Discussion
Source of Manufacturing Data: Description sources of data	Manufacturing data was collected from Tafisa's manufacturing plant located at 4660 Rue Villeneuve, Lac-Mégantic, in the province of Quebec, Canada, for the 2019 production year. This data included: the total production mass of products produced at the manufacturing plant, as well as the total annual units in m3 and total production mass of products under study; raw materials entering the production of the products under study; materials losses; transport mode and distance of materials; energy consumption; water consumption; emissions to the environment at the manufacturing plant; waste treatment; and packaging material.
Source of Secondary Data: Description sources of raw materials, energy source, transport, waste and packaging data	When appropriate, the grid mix was changed for the grid mix of the province or country where production takes places. Otherwise, ecoinvent data representative of the global market or "rest-of-the-world" were selected as proxies. Wood extraction data and transport data were taken form the US LCI database, which is specific to a North American context.

Data Quality Parameter	Data Quality Discussion
Geographical Representativeness	Tafisa’s manufacturing facility is located in the province of Quebec, Canada; hence, electricity consumption is based on the hydropower grid mix. Geographical correlation of the material supply and the selected datasets are representative of each specific area or a larger area (for example, wood material comes mainly from Canada and a low percentage from the USA).
Temporal Representativeness	Primary data was collected to be representative of the full year 2019, although this was not always the case for ecoinvent and US LCI datasets. Nevertheless, ecoinvent and US LCI remain the reference LCI databases.
Technological Representativeness	Primary data obtained from the manufacturer is representative of the current technologies and materials used by the company.
Completeness	All relevant process steps were considered and modeled to satisfy the goal and scope. Cut-off criteria were respected.

4. LIFE CYCLE ASSESSMENT RESULTS

4.1. RESULTS TABLES

It should be noted that Life Cycle Impact Assessment (LCIA) results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

The life cycle assessment results are presented per DU. According to the PCR, Part B section 5, results presented derive from the life cycle impact assessment (LCIA) and the life cycle inventory (LCI).

According to the PCR, the life cycle impact assessment must be presented for the North American context [3].

LCIA results are presented in **Table 5** and **Table 6** for particleboard and decorative panels, respectively.

Table 5: Particleboards Life Cycle Impact Assessment Results

Impact Categories	Units	Extraction (A1)	Transport (A2)	Manufacturing (A3)	Total
Global Warming Potential	kg CO_2 eq	2.21E+02	1.44E+01	9.86E+01	3.34E+02
Biogenic Carbon Removal from Product System	kg CO_2 eq.	-1.13E+03	0.00E+00	-1.19E+02	-1.25E+03
Biogenic Carbon Emissions from Product System	kg CO_2 eq.	0.00E+00	0.00E+00	1.25E+03	1.25E+03
Ozone Depletion Potential	kg CFC-11 eq	2.26E-05	5.12E-07	8.35E-06	3.14E-05
Acidification Potential	kg SO_2 eq	1.04E+00	8.63E-02	1.26E-01	1.25E+00
Eutrophication Potential	kg N eq	4.31E-01	6.47E-03	8.15E-02	5.19E-01
Smog Formation Potential	kg O_3 eq	1.13E+01	2.74E+00	1.73E+00	1.58E+01
Abiotic Resource Depletion Potential of Non-Renewable (Fossil) Energy Resources (ADPfossil)	MJ surplus	3.64E+02	2.93E+01	3.32E+01	4.27E+02

Table 6: Decorative panels (TFL) Life Cycle Impact Assessment Results

Impact categories	Units	Extraction (A1)	Transport (A2)	Manufacturing (A3)	Total
Global Warming Potential	kg CO_2 eq	2.55E+02	1.46E+01	1.94E+02	4.63E+02
Biogenic Carbon Removal from Product System	kg CO_2 eq.	-1.17E+03	0.00E+00	-2.20E+02	-1.38E+03
Biogenic Carbon Emissions from Product System	kg CO_2 eq.	0.00E+00	0.00E+00	1.38E+03	1.38E+03
Ozone Depletion Potential	kg CFC-11 eq	2.84E-05	5.19E-07	1.64E-05	4.53E-05
Acidification Potential	kg SO_2 eq	1.23E+00	8.75E-02	2.57E-01	1.57E+00
Eutrophication Potential	kg N eq	5.41E-01	6.55E-03	1.64E-01	7.11E-01
Smog Formation Potential	kg O_3 eq	1.32E+01	2.78E+00	3.43E+00	1.94E+01
Abiotic Resource Depletion Potential of Non-Renewable (Fossil) Energy Resources (ADPfossil)	MJ surplus	4.43E+02	2.97E+01	6.98E+01	5.42E+02

(1): Calculated as per U.S EPA TRACI 2.1, OpenLCA v 1.10.3

(2): GWP 100 excludes biogenic CO_2 removals and emissions associated with biobased products and packaging; 100-year time horizon GWP factors are provided by the IPCC 2013 Fifth Assessment Report (AR5).

4.2. LIFE CYCLE INVENTORY RESULTS

According to the PCR, the life cycle inventory (LCI) must be presented for the "resources used" and "output flows and waste" categories [3]. The environmental parameters use for the inventory analysis describes the use of renewable and non-renewable material resources, renewable and non-renewable primary energy, and water. The LCI results are presented in **Table 7** and **Table 8** for particleboards and decorative panels, respectively.

Table 7: Particleboards Life Cycle Inventory Results

Resource use					
Parameters	Units	Production stage			Total
		Extraction (A1)	Transport (A2)	Manufacturing (A3)	
RPR_E(3)	MJ, LHV	5.00E+03	9.95E-02	6.79E+02	5.68E+03
RPR_M(4)*	MJ, LHV	6.83E+03	N/A	N/A	6.83E+03
$NRPR_E$(5)	MJ, LHV	1.59E+03	2.10E+02	2.84E+02	2.09E+03
$NRPR_M$(6)*	MJ, LHV	1.92E+03	N/A	N/A	1.92E+03
SM(7)	kg	1.68E+02	N/A	N/A	1.68E+02
RSF (8)	MJ, LHV	N/A	N/A	0.00E+00	0.00E+00
NRSF(9)	MJ, LHV	N/A	N/A	0.00E+00	0.00E+00
RE(10)	MJ, LHV	N/A	N/A	0.00E+00	0.00E+00
FW(11)	m^3	N/A	N/A	1.31E-01	1.31E-01
Output Flows and Waste					
HWD(12)	kg	N/A	N/A	4.92E-02	4.92E-02
NHWD(13)	kg	N/A	N/A	9.46E+00	9.46E+00
HLRW(14)	m^3	N/A	N/A	N/A	N/A
ILLRW(15)	m^3	N/A	N/A	N/A	N/A
CRU(16)	kg	N/A	N/A	N/A	N/A
MR(16)	kg	N/A	N/A	3.24E+00	3.24E+00
MER(16)	kg	N/A	N/A	5.66E+01	5.66E+01
EE(16)	MJ, LHV	N/A	N/A	3.88E+01	3.88E+01

Table 8: Decorative Panels Life Cycle Inventory Results

Resource Use					
Parameters	Units	Production stage			Total
		Extraction (A1)	Transport (A2)	Manufacturing (A3)	
RPR_E(3)	MJ, LHV	4.52E+03	1.01E-01	1.03E+03	5.55E+03
RPR_M(4)*	MJ, LHV	6.48E+03	N/A	N/A	6.48E+03
$NRPR_E$(5)	MJ, LHV	2.27E+03	2.13E+02	6.00E+02	3.08E+03
$NRPR_M$(6)*	MJ, LHV	1.87E+03	N/A	N/A	1.87E+03
SM(7)	kg	1.67E+02	N/A	N/A	1.67E+02
RSF (8)	MJ, LHV	N/A	N/A	0.00E+00	0.00E+00
NRSF(9)	MJ, LHV	N/A	N/A	0.00E+00	0.00E+00
RE(10)	MJ, LHV	N/A	N/A	0.00E+00	0.00E+00
FW(11)	m^3	N/A	N/A	2.41E-01	2.41E-01
Output Flows and Waste					
HWD(12)	kg	N/A	N/A	9.52E-02	9.52E-02
NHWD(13)	kg	N/A	N/A	9.46E+00	9.46E+00
HLRW(14)	m^3	N/A	N/A	N/A	N/A
ILLRW(15)	m^3	N/A	N/A	N/A	N/A
CRU(16)	kg	N/A	N/A	N/A	N/A
MR(16)	kg	N/A	N/A	6.27E+00	6.27E+00
MER(16)	kg	N/A	N/A	1.09E+02	1.09E+02
EE(16)	MJ, LHV	N/A	N/A	7.49E+01	7.49E+01

*In the calculation of RPR_M and $NRPR_M$, packaging materials were excluded.

(3): RPR_E = RPRT - RPR_M, where RPRT is equal to the value for renewable energy obtained using the CED LHV.

(4): RPR_M is calculated by multiplying the mass (kg) of the material input (or its components) by the net calorific value (lower heating value) (MJ/kg) of this input as per ACLCA ISO 21930 Guidance [4]. In the calculation of RPR_M, packaging materials were excluded.

(5): $NRPR_E$ = NRPRT - $NRPR_M$, where NRPRT is equal to the value for non-renewable energy obtained using the CED LHV methodology (both non-renewable energy fossil fuel and nuclear).

(6): $NRPR_M$ is calculated by multiplying the mass (kg) of the material input (or its components) by the net calorific value (lower heating value) (MJ/kg) of this input as per ACLCA ISO 21930 Guidance [4]. In the calculation of $NRPR_M$, packaging materials were excluded.

(7): Calculated as per ACLCA ISO 21930 Guidance [4], 6.5 Secondary material (SM): There is SM involved in Tafisa panels.

(8): Calculated as per ACLCA ISO 21930 Guidance [4], 6.6 Renewable secondary fuels (RSF): There is no RSF involved in the Tafisa panel manufacturing process.

(9): Calculated as per ACLCA ISO 21930 Guidance [4], 6.7 Non-renewable secondary fuels (NRSF): There is no NRSF involved in the Tafisa panel manufacturing process.

(10): Calculated as per ACLCA ISO 21930 Guidance [4], 6.8.1 Recovery Energy (RE): There is no RE involved in the Tafisa panel manufacturing process

(11): Represents the net use of fresh water at the manufacturing site.

(12): Calculated from life cycle inventory results, based on datasets marked as "hazardous."

(13): Calculated from life cycle inventory results, based on "non-hazardous" waste.

(14): Calculated as per ACLCA ISO 21930 Guidance [4], 10.3 High-level radioactive waste (HLRW), conditioned, to final repository. It should be noted that the Tafisa panel manufacturing process does not generate any HLRW. High-level radioactive waste, e.g., when generated by electricity production, consists mostly of spent fuel from reactors. (ISO 21930:2017, clause 7.2.14).

(15): Calculated as per ACLCA ISO 21930 Guidance [4], 10.4 Intermediate- and low-level radioactive waste (ILLRW), conditioned, to final repository. It should be noted that the Tafisa panel manufacturing process does not generate any ILLRW. Low- and intermediate-level radioactive wastes, e.g., when generated by electricity production, arise mainly from routine facility maintenance and operations (ISO 21930:2017, clause 7.2.14).

(16): Materials for recycling (MR), materials for energy recovery (MER) and exported energy (EE) are applicable for this project, except Reused components (CRU).

4.3. CONTRIBUTION ANALYSIS

The aim of this section is to present more details on the contribution to the impacts and resource use of the different life cycle modules of each panel product studied.

The contribution analysis of the Tafisa particleboards (**Figure 3**) indicates that the major contributor module is module A1 for all impact categories. The impacts are between 66% et 85%. The impacts of the manufacturing module (A3) represent the second contributor to the total impacts for all impact categories except for the smog formation potential impact category. The major contribution of module A2 is present in the smog formation impact category (17%) due to diesel combustion during truck operations.

Breaking down the extraction and upstream production module (A1), the production of MUF adhesive is the major contributor with impacts between 77% and 92% of the total impact categories for all indicators.

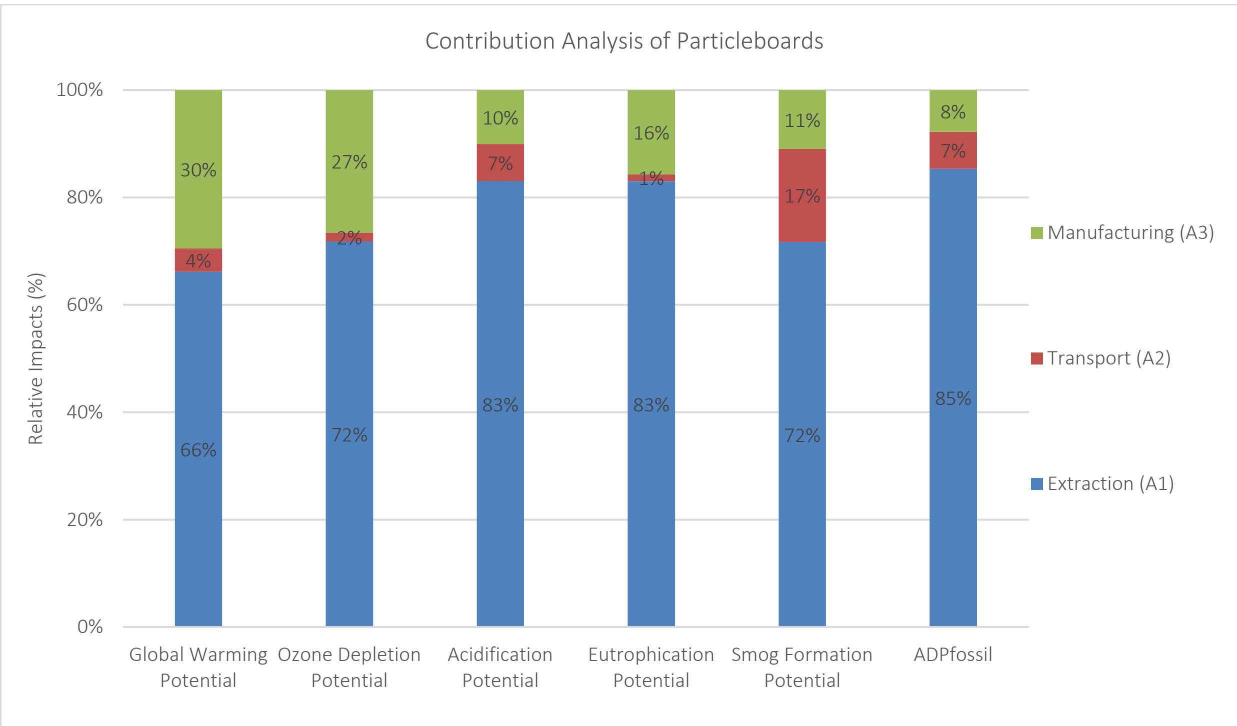

Figure 3: Contribution of each life cycle module for Tafisa Particleboards.

As presented for the particleboard product, the trend is pretty conservative for decorative panels as presented in Figure 4. This is because the products studied have similar inputs and outputs. The difference comes from the fact that the decorative panels have impregnated decorative paper applied on their surfaces. The impacts of the extraction and upstream production modules (A1) represent between 55% and 82% of the total impacts for all indicators. The impacts of the manufacturing module (A3) represent the second contributor to the total impacts, for all indicators.

The major contribution of module A2 is present in the smog formation impact category (14%) due to diesel combustion during truck operations.

The analysis of the extraction and upstream production module (A1) shows that the production of MUF adhesive is the major contributor with impacts between 63% and 76% of the total impact categories for all indicator, followed by impregnated decorative paper production with impacts between 15% and 22%.

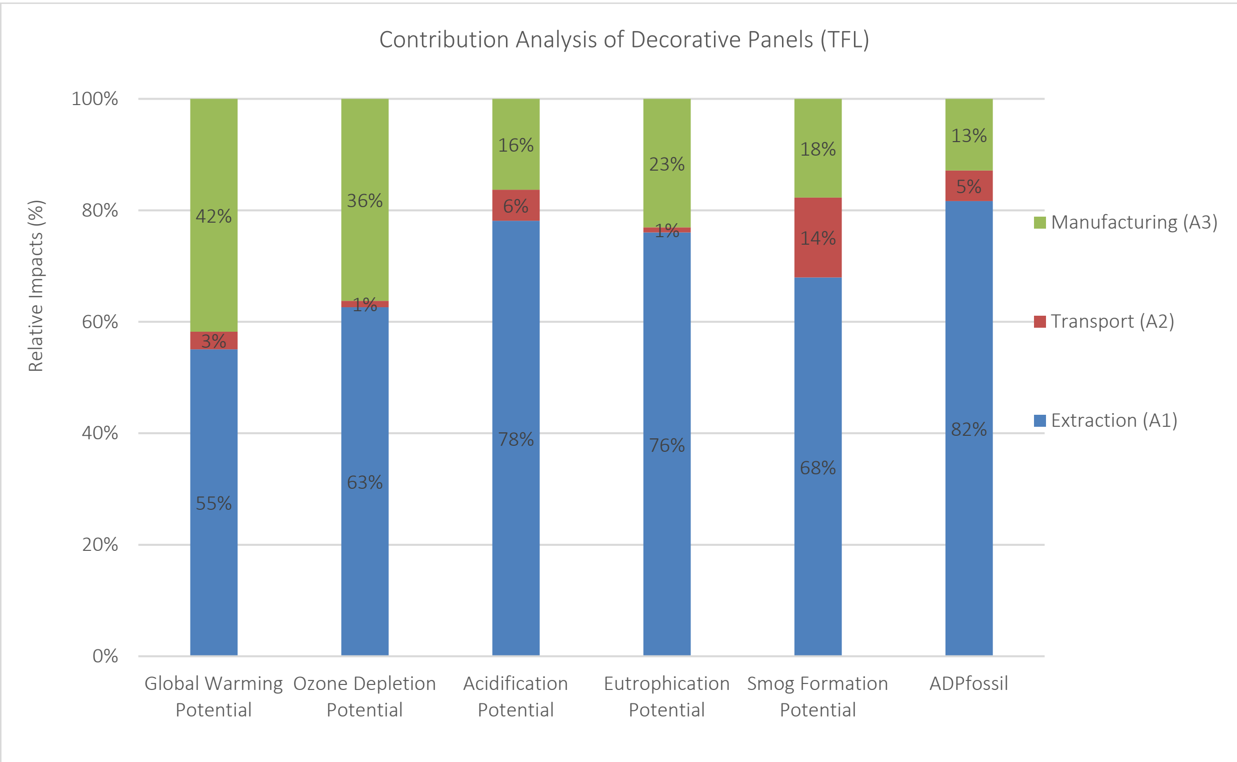

Figure 4: Contribution of each life cycle module for Tafisa Decorative Panels.

5. ADDITIONAL ENVIRONMENTAL INFORMATION

In addition, Tafisa Canada is part of a third-party verification process with Vertima Inc. where their products and environmental documents are assessed. At the end of the process, they received a Validated Eco-Declaration® (EDS-Environmental Data Sheet) summarizing verified environmental claims.

Tafisa also has a Health Product Declaration (HPD) for its particleboard and decorative panel products.

5.1. CARBON SEQUESTRATION

The amount of biogenic carbon contained within bio-based material leaving the product system must be declared as technical scenario information in the module where the material is leaving the product system. Table 9 presents the biogenic carbon content in the product at the manufacturing gate.

Table 9: Biogenic carbon content in one m^3 of Tafisa panels at manufacturing gate.

Modules	Parameters	Particleboards	Decorative Panels	Units
		Values	Values	
A1	Biogenic Carbon Removal from Product	-1132.26	-1165.21	kg CO2 eq.
A3	Biogenic Carbon Emission from Product (as exported product out to the system boundaries)	1132.26	1165.21	kg CO2 eq.
	Biogenic Carbon Removal from Packaging	-15.34	-19.31	kg CO2 eq.
	Biogenic Carbon Emission from Packaging	15.34	19.31	kg CO2 eq.
	Biogenic Carbon Removal from Combustion of Waste from Renewable Sources Used in Production Processes	-103.69	-200.43	kg CO2 eq.
	Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	103.69	200.43	kg CO2 eq.

6. REFERENCES

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Tafisa Canada Inc.

4660 Rue Villeneuve

Lac-Mégantic (Quebec)

G6B 2C3 Canada

https://tafisa.ca/en

This LCA and EPD were prepared by Vertima Inc.

604 Saint Viateur Street,
Quebec, QC
(418) 990-2800
G2L 2K8 CANADA

Environmental certification experts

vertima.ca