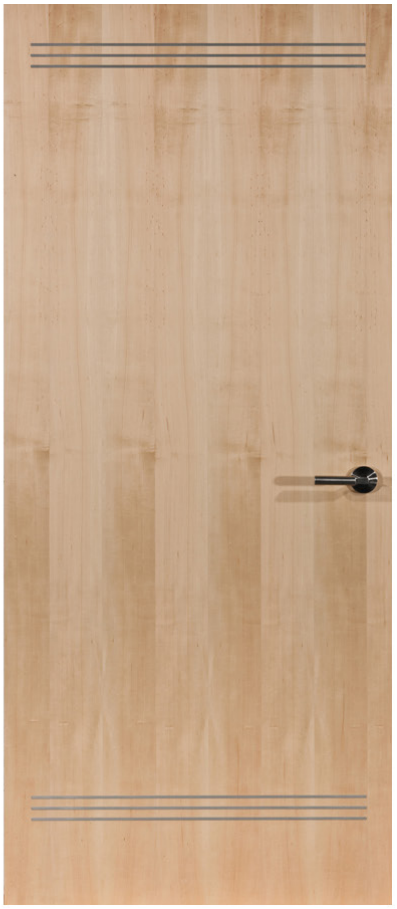
LAMBTON Doors
WOOD DOOR AND JAMB SOLUTIONS

TECHNOLOGY | DESIGN | ENVIRONMENT

Particleboard Core (PC) Doors, 8300 Particleboard Core (PC) Doors and Structural Composite Lumber Core (SCL) Doors



LAMBTON Doors

ENVIRONMENTAL PRODUCT DECLARATION

ISO 14025:2006

LAMBTON Doors is pleased to present this Environmental Product Declaration (EPD) for their Particleboard Core (PC) Doors, 8300 Particleboard Core (PC) Doors and Structural Composite Lumber Core (SCL) Doors. 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 LAMBTON Doors, visit www.lambtondoors.com

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**

#2036-5269

Dec 2021 - Dec 2026

1. GENERAL INFORMATION

PCR GENERAL INFORMATION			
Reference PCR	Interior Architectural Wood Door Leaves NSF International, March 2015 to February 2022		
The PCR review was conducted by:	*Jamie Meil* *Athena Sustainable Materials Institute (Chairperson)*	*Jerry Heppes Sr.* *Door and Hardware Institute*	*James Salazar* *Coldstream Consulting*

EPD GENERAL INFORMATION		
Program Operator	CSA Group 178 Rexdale Blvd, Toronto, Ontario, Canada M9W 1R3 www.csagroup.org	
Declared Product	**Product group 1**: Particleboard Core (PC) Doors, which includes models 5-PC-CE/ME/BE, 5-UFPC-ECE/EME/EBE and 5-FSPC-ECE/EME/EBE. **Product group 2**: 8300 Particleboard Core (PC) Doors, which includes models 5-8300-CE/ME/BE, 5-UF8300-ECE/EME/EBE and 5-FS8300-ECE/EME/ EBE. **Product group 3**: Structural Composite Lumber Core (SCL) Doors, which includes models 5-LSL-CE/ME/BE, 5-UFLSL-ECE/EME/EBE, 5-FSLSL-ECE/EME/EBE, 5-SCL45-CE/ME/BE, 5-UFSCL45-ECE/EME/EBE and 5-FSSCL45-ECE/EME/EBE.	
EPD Registration Number 2063-5269	**EPD Date of Issue** December 17, 2021	**EPD Period of Validity** December 16, 2026
EPD Recipient Organization	LAMBTON Doors 235, 2nd Avenue Lambton (Quebec) G0M 1H0 CANADA www.lambtondoors.com	LAMBTON Doors WOOD DOOR AND JAMB SOLUTIONS TECHNOLOGY DESIGN ENVIRONMENT
EPD Type/Scope and Declared Unit Average product-specific cradle-to-gate EPD with declared unit of 1 single door leaf unit measuring 1.95 m^2 (21 ft^2) at a nominal 44.45 mm (1-3/4 in.) thickness		**Year of Reported Manufacturer primary data** 2018
LCA Software OpenLCA v.1.10.3	**LCI databases** Ecoinvent 3.7 and US LCI	**LCIA Methodology** TRACI 2.1
This LCA and EPD were prepared by:	Chantal Lavigne, M.A.Sc. Vertima Inc. www.vertima.ca	
This EPD and LCA were independently verified in accordance with ISO 14025:2006, ISO 14040:2006 and ISO 14044:2006, as well as the NSF International PCR "Interior Architectural Wood Door Leaves", which is based on ISO 21930:2007. ☐ Internal ☒ External	Jean-François Ménard Jean-François Ménard CIRAIG – Polytechnique Montréal	

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. 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. [1] 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." [8] Given this EPD is cradle-to-gate in scope, comparisons of EPD data from one product to another is not allowed.

2. PRODUCT SYSTEM DESCRIPTION

LAMBTON Doors is a North American manufacturer of wood doors and wood door frames for commercial, architectural and institutional markets. Its manufacturing facility is based in Lambton (Quebec).

2.1. PRODUCT DESCRIPTION

LAMBTON Doors' interior commercial 5-ply doors[1] studied in this report include multiple series gathered into three product groups.

Average Particleboard Core (PC) Doors

- Five (5) ply doors with particleboard core standard series: 5-PC-CE/ME/BE
- Five (5) ply doors with particleboard core made of ULEF/NAF wood board, part of LAMBTON DOORS' Ecological EnviroDesign™ Series: 5-UFPC-ECE/EME/EBE
- Five (5) ply doors with particleboard core and FSC Certified ULEF/NAF wood, part of LAMBTON DOORS' Ecological EnviroDesign™ Series: 5-FSPC-ECE/EME/EBE

Average 8300 Particleboard Core (PC) Doors

- Five (5) ply doors with particleboard core standard series: 5-8300-CE/ME/BE
- Five (5) ply doors with particleboard core made of ULEF/NAF wood board, part of LAMBTON DOORS' Ecological EnviroDesign™ Series: 5-UF8300-ECE/EME/EBE
- Five (5) ply doors with particleboard core and FSC Certified ULEF/NAF wood, part of LAMBTON DOORS' Ecological EnviroDesign™ Series: 5-FS8300-ECE/EME/EBE

Average Structural Composite Lumber Core (SCL) Doors

- Five (5) ply doors with structural composite lumber core standard series: 5-LSL-CE/ME/BE
- Five (5) ply doors with structural composite lumber core made of ULEF/NAF wood board, part of LAMBTON DOORS' Ecological EnviroDesign™ Series: 5-UFLSL-ECE/EME/EBE
- Five (5) ply doors with structural composite lumber core and FSC Certified ULEF/NAF wood, part of LAMBTON DOORS' Ecological EnviroDesign™ Series: 5-FSLSL-ECE/EME/EBE
- 45-minutes fire-rating five (5) ply doors with structural composite lumber core standard series: 5-SCL45-CE/ME/BE
- 45-minutes fire-rating five (5) ply doors with structural composite lumber core made of ULEF/NAF wood board, part of LAMBTON DOORS' Ecological EnviroDesign™ Series: 5-UFSCL45-ECE/EME/EBE
- 45-minutes fire-rating five (5) ply doors with structural composite lumber core and FSC Certified ULEF/NAF wood, part of LAMBTON DOORS' Ecological EnviroDesignTM Series: 5-FSSCL45-ECE/EME/EBE

The doors are made of 5 plies, where the number of plies represents the number of layers of material. The LAMBTON Doors five-ply doors are made of three major sub-assemblies: two faces, two crossbands and a core. Door faces are

[1] Wood doors are classified under UN CPC 31600 and CSI MasterFormat 081400.

made of hardwood veneer, for aesthetics, and are glued to fiberboard (HDF) crossbands, to ensure veneer dimensional and physical integrity. For Particleboard Core (PC) doors (PC and 8300 PC), the door core is composed of particleboard, while it is composed of laminated strand lumber (LSL) in the case of Structural Composite Lumber Core (SCL) doors. All doors have laminated strand lumber (LSL) stiles and rails as well as hardwood edges. Three types of edges are available in each series: CE (Compatible Edge), ME (Matching Edge) and BE (Blind Edge). The differences between the "PC" Particleboard Core Doors and "8300 PC" Particleboard Core Doors reside in the width of the stiles and rails that are larger in the "8300 PC" door group. The adhesive used for assembling door components, i.e., faces, crossbands and core, is polyvinyl acetate (PVAc). The product may be finished with a UV curable coating on all surfaces and is pre-machined on-site to receive standardized hardware such as a door-lock system and hinges. However, hardware, like the door lock system and hinges, are not included nor provided by the manufacturer.

The UF door series is unique in its volatile organic compounds (VOCs) emissions. Panels used in UF doors, such as particleboard, laminated strand lumber and HDF are certified against low-VOC emissions in accordance with TSCA Title VI[2] (formally Californian regulation 93120[3]). However, no VOC emission levels have been measured for the final product. As for the FS door series, the core is made with FSC[4]- certified panel, which are also certified against low-VOC emissions in accordance with TSCA Title VI[2], as well as the stiles in the case of the 8300 Particleboard Core doors.

Finally, structural composite lumber core doors which include number 45 in the door model (e.g., 5-UFSCL45-ECE/EME/EBE), signifies that this model has a fire resistance of 45 minutes. The composition of these doors is the same as the standard Structural Composite Lumber (SCL) Core Doors; the difference resides in the production process. Details of the door specifications are available at https://www.lambtondoors.com/architects-space/technical-space/doors-and-jambs/.

[Photo courtesy of LAMBTON Doors].

[2] TSCA Title VI regulation became effective on May 22, 2017. More details available at https://www.epa.gov/formaldehyde/formaldehyde-emission-standards-composite-wood-products. Note that SCL wood products, which include LSL, remain exempt from the regulation as it was for CARB 93120.

[3] The Composite Wood Products (CWP) Regulation, also known as the California Air Resource Board (CARB) 93120 regulation, took effect in 2009. Manufacturers and fabricators of finished goods that use any of these materials are required to use composite wood that meets the formaldehyde emission limits in the CWP Regulation. More details available at https://ww2.arb.ca.gov/our-work/programs/composite-wood-products-program and in the document http://www.arb.ca.gov/toxics/compwood/consumer_faq.pdf.

[4] LAMBTON Doors' FSC Certification information details can be found at https://info.fsc.org/certificate.php under the license code FSC-C001968.

Product specification

LAMBTON Doors wood doors are in conformity with the following industry standards:

- Architectural Woodwork Standards (AWS), 2nd edition [4] and NAAWS 4.0 [5];
- ANSI/WDMA I.S. 1A-2021 Interior Architectural Wood Flush Doors [6];
- ASTM D5456-09 Standard Specification for Evaluation of Structural Composite Lumber Products [7];
- ANSI A208.1. – 2016 Particleboard [8].

Technical requirements

Door Series	Fire rating	Thickness	Maximum size
5-PC-CE/ME/BE 5-UFPC-ECE/EME/EBE 5-FSPC-ECE/EME/EBE 5-8300-CE/ME/BE 5-UF8300-ECE/EME/EBE 5-FS8300-ECE/EME/EBE 5 -LSL-CE/ME/BE 5-FSLSL-ECE/EME/EBE 5-UFLSL-ECE/EME/EBE	Non-Rated	1-3/8'' (35mm) to 2-1/4'' (57mm)	48" x 120" (1219 mm x 3048 mm)
	20 minutes neutral pressure	1-3/4'' (44mm) to 2-1/4'' (57mm)	
	20 minutes positive pressure		48" x 108" (1219 mm x 2743 mm)
5-SCL45-CE/ME/BE 5-UFSCL45-ECE/EME/EBE 5-FSSCL45-ECE/EME/EBE	45 minutes neutral or positive	1-3/4'' (44mm) to 2-1/4'' (57mm)	48" x 96" (1219 mm x 2438 mm) 96" x 96" (2438 mm x 2438 mm)

2.2. MATERIAL COMPOSITION

Component/Material	Particleboard Core (PC) Doors	8300 Particleboard Core (PC) Doors	Structural Composite Lumber Core (SCL) Doors
	Weighted average	Weighted average	Weighted average
Core / Particleboard or LSL	65.55%	51.81%	70.16%
Stiles and rails / LSL	7.45%	22.82%	6.40%
Edges / Hardwood	1.56%	1.46%	1.34%
Crossbands / HDF	22.12%	20.75%	19.07%
Faces / Wood veneer	2.04%	1.89%	1.75%
Adhesive / PVAc	0.95%	0.95%	0.95%
UV Coating	0.33%	0.33%	0.33%
TOTAL (kg)	49.66	53.47	57.77

For details on materials content, refer to the Health Product Declaration (HPD) that can be found at http://www.hpd-collaborative.org/hpd-public-repository/ [9].

2.3. PRODUCT APPLICATION

LAMBTON Doors' wooden doors are mainly used in commercial, architectural and institutional building types.

2.4. MANUFACTURING

The product, whichever the edge option, is made of three major sub-assemblies: two faces, two crossbands and a core. Door faces are made of hardwood veneer, for aesthetics, and crossbands are made of high-density fibreboard (HDF), to ensure veneer dimensional and physical integrity. The core is composed of either laminated strand lumber (LSL) for Structural Composite Lumber Core Doors, or particleboard for Particleboard Core Doors (PC and 8300 PC). The adhesive used in the assembly of the door components, i.e., faces and core, is Polyvinyl Acetate (PVAc). The product may be finished with a UV curable coating on all surfaces and is pre-machined on-site to receive standardized hardware such as a door-lock system and hinges. Doors with compatible edges (CE/ECE) and matching edges (ME/EME) undergo the same manufacturing process in-house. The main difference lies in the hardwood species used for edges. Matching edges refers to identical hardwood species for veneer and edges, while compatible edges refer to similar wood species (pattern and color) for veneer and edges. The manufacturing process for doors with blind edges (BE/EBE) requires two additional steps to create the blind edge effect: adding hardwood edges later in the process using the double edge bander and sanding this assembly before applying the veneer sheets on both faces.

2.5. PACKAGING

LAMBTON Doors' wooden doors undergo two types of packaging before being shipped. The first is to protect the door with an individual polyethylene film. The second is to prepare pallets for shipping, where 25 doors are gathered and wrapped with stretch films.

2.6. TRANSPORTATION

As the system boundaries of the Environmental Product Declaration (EPD) are cradle-to-gate, transport after the manufacturing gate is excluded from the study.

2.7. PRODUCT INSTALLATION

Please refer to specific guidelines for product installation: https://www.lambtondoors.com/architects-space/technical-space/forms-and-miscellaneous/.

2.8. USE CONDITIONS

For this EPD, the system boundaries encompass a cradle-to-gate scope. Environmental impacts of the product in the use phase are excluded from this declaration, per NSF International PCR Interior Architectural Wood Door Leaves [10].

All LAMBTON Doors wood doors and frames carry a lifetime warranty, as of the shipping date, against all manufacturing defects that could render them unserviceable or unsuitable for normal use. Details on warranties and maintenance can be found online at https://www.lambtondoors.com/architects-space/warranties/.

2.9. PRODUCT REFERENCE SERVICE LIFE AND BUILDING ESTIMATED SERVICE LIFE

As the system boundaries of the Environmental Product Declaration (EPD) are cradle-to-gate, this information is excluded from the study.

2.10. RE-USE PHASE

Wood doors can be re-used if not damaged.

2.11. DISPOSAL

Wood doors are, by weight, mostly made of wood, which can be recycled or recovered for energy. In Quebec in 2015, 71.5% of building construction and demolition waste were sent to sorting centers. Of the wood recovered at sorting centers, 63% are recovered for energy, while 37% are recycled mainly into particleboards or wood fiber panels [11].

3. LCA CALCULATION RULES

3.1. DECLARED UNIT

The selected declared unit (DU) for this study is: **a single door leaf unit measuring 1.95 m^2 (21ft^2) at a nominal 44.45mm (1-3/4in.) thickness.**

Description	Particleboard Core (PC) Door	8300 Particleboard Core (PC) Door	Structural Composite Lumber Core (SCL) Doors	Unit
Declared Unit	1	1	1	Door leaf
Mass of Door (weighted average)	49.66	53.47	57.77	kg
Conversion factor to 1 kg	0.020 (=1/49.66)	0.019 (=1/53.47)	0.017 (=1/57.77)	
Nominal size and thickness	914 x 2134 x 44 (3 x 7 x 1 ¾)	914 x 2134 x 44 (3 x 7 x 1 ¾)	914 x 2134 x 44 (3 x 7 x 1 ¾)	mm (ft x ft x inch.)
Door area	1.95 (21)	1.95 (21)	1.95 (21)	m^2 (ft^2)
Ratio to standard door	1	1	1	=(1.95/1.95)

3.2. PRODUCTION AVERAGE

The production weighted average is calculated based on the mass-weighted average of the production for the 2018 production year at LAMBTON Doors.

3.3. SYSTEM BOUNDARIES

The system boundaries are **cradle-to-gate**, i.e., only cover the production life cycle stage as illustrated in **Table 1**. Within this life cycle stage, three (3) modules are considered, namely A-1) Raw materials supply, A-2) Raw materials transportation to the manufacturing plant and A-3) Manufacturing. Construction (A-4; A-5), use (B-1 to B-7) and end-of-life (C-1 to C-4) stages are not included in the present study. Figure 1 presents the process flow diagram for wood doors.

Table 1: Description of the system boundary life cycle stages and related information modules

PRODUCTION STAGE			CONSTRUC-TION PROCESS STAGE		USE STAGE							END-OF-LIFE STAGE			
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
Raw material supply	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)

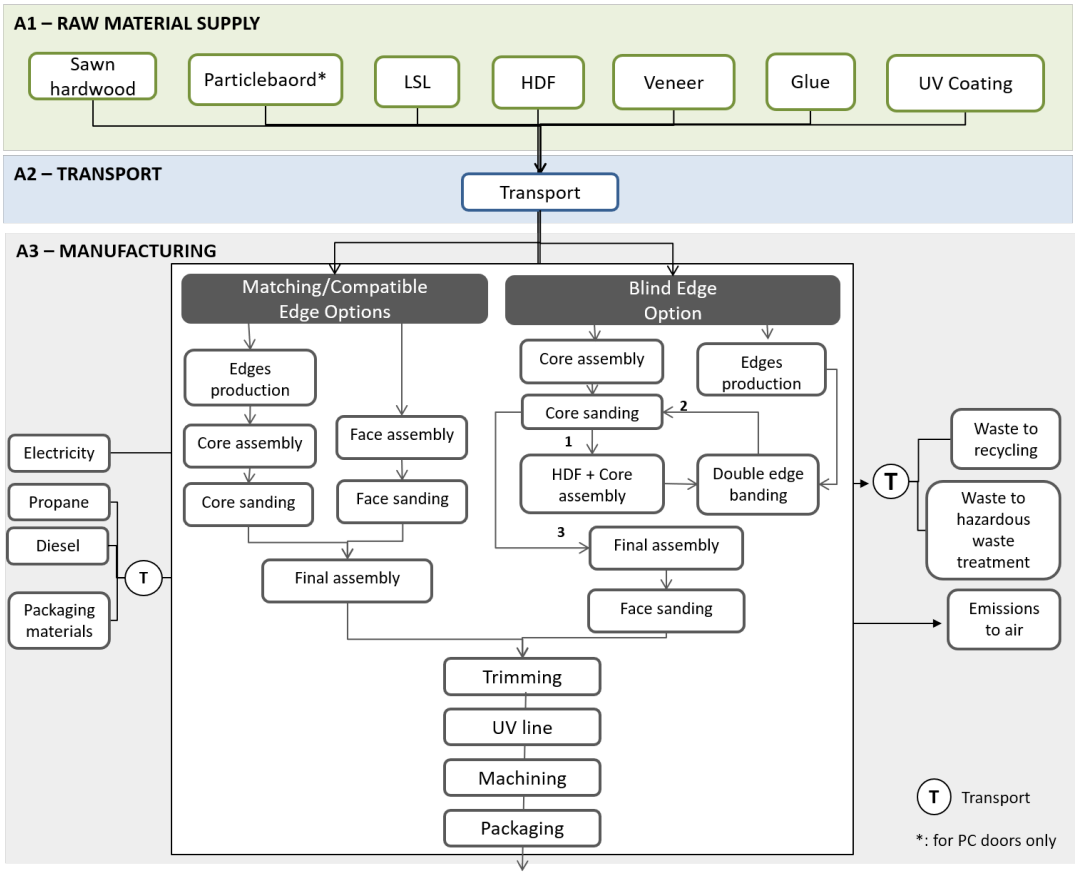


Figure 1: System boundaries of cradle-to-gate LCA (module A1 to A3) of LAMBTON DOORS' Wood Doors produced in Lambton (Quebec).

Life Cycle Stages

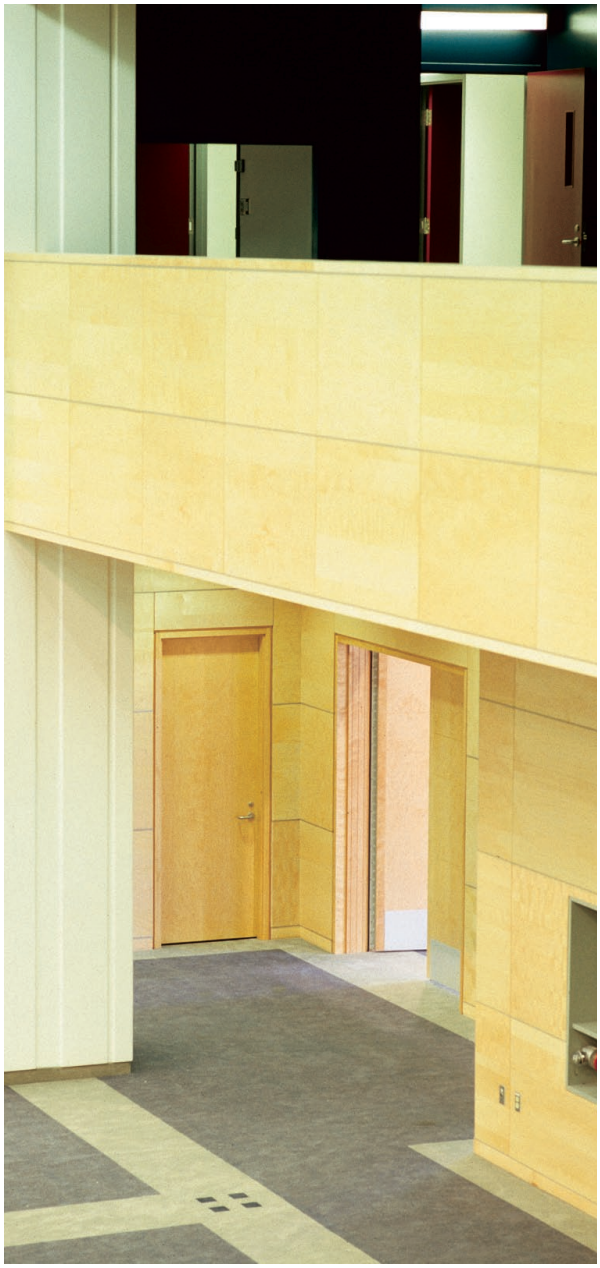
Raw material supply: this module includes the extraction and transformation of raw materials included in the wood doors, such as particleboard (PC), structural composite lumber (SCL), high density fiberboard (HDF), veneer and hardwood, as well as PVAc-based adhesives and UV-curable finishing.

Raw materials transportation: this module includes the transportation of raw materials from LAMBTON Doors' suppliers to the LAMBTON Doors' facility.

Manufacturing: the basic steps of door manufacturing are the assembly of door components, surface finishing and machining. The only components that require on-site transformation are hardwood edges made from sawn hardwood. Inputs and outputs of a door assembly are respectively electricity for the machinery (glue applicators, presses, trimming, sanding), propane for additional heating of the merchandize reception area, diesel used in on-site transport (forklift), material losses and VOC emissions from adhesives. There are no water consumption or water emissions. It should be noted that products needed for product installation such as hinges, door handles and locks are excluded from the study.

Manufacturing losses (e.g., trims) during the process, as well as product losses, generate waste which is sent to a recycling center. Leftover glue and UV-curable finishes are sent to hazardous waste treatment.

Finally, packaging materials to make products ready for shipment, as well as their transport to LAMBTON Doors' manufacturing plant, are covered by this module.



3.4. CUT-OFF CRITERIA

In this EPD, no flows were excluded. It should be noted that no data on the construction, maintenance or dismantling of the capital goods and infrastructure, daily transport of the employees, office work, business trips and other activities from LAMBTON Doors' employees was included in the model. The model only takes into account the processes associated with infrastructure that are already included in the *ecoinvent* unit processes. Also excluded is the energy and water use related to company management and sales activities located within the factory site.

3.5. ALLOCATION

Data relative to energy (electricity, diesel and propane), glue, UV-curable finishes and packaging consumption was provided for the whole manufacturing plant and for total production, as well as glue and UV-curable finishes sent to hazardous waste. In this EPD, when allocation could not be avoided, mass allocation was used.

Waste processing of the material flows undergoing recycling processes are included up to the system boundary of the end-of-waste state [10]. In other words, a cut-off approach was used as further processing of the recycled material is part of raw material preparation of another product system (open-loop recycling).

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 LAMBTON Doors' manufacturing plant located in Lambton (Quebec). This data included total annual mass of products produced at the manufacturing plant, raw materials entering the production of the products under study, losses of materials, transport distance of materials, energy consumption, waste treatment, and packaging.
Source of secondary data: Description sources of raw material, energy source, waste and packaging data	Data used for particleboard, structured composite lumber (SCL) and HDF were taken from published EPDs. For hardwood, veneer and road transport, data were taken from the US LCI database [12], which is specific to a North American context. For all other processes, data were taken from ecoinvent 3.7 "cut-off" datasets representative of production regions [13]. When appropriate, the grid mix was changed for the grid mix of the province or country where the production takes places. Otherwise, data representative of a larger area, such as the global market or "rest-of-the-world," were selected.
Geographical representativeness	The manufacturing facility is based in the province of Quebec; hence electricity consumption is based on the Quebec grid mix. Geographical correlation of the material supply and the selected datasets are, in majority, representative of their production area. When this was not possible, datasets that represent a larger geographical area were taken.
Temporal representativeness	Primary data is based on LAMBTON Doors 2018 annual production data. Life cycle inventory datasets selected from published EPDs were published within the last ten years, while this is not always the case for ecoinvent and US LCI datasets. Nevertheless, ecoinvent and US LCI remain reference LCI databases.
Technological representativeness	Primary data, obtained from the manufacturer, is representative of the current technologies and materials used by this company.
Completeness	All relevant process steps were considered and modeled to satisfy the goal and scope. No known flows were cut-off.

4. LIFE CYCLE ASSESSMENT RESULTS

4.1. RESULTS TABLES

Results are presented for **one single door leaf unit measuring 1.95 m^2 (21ft^2) at a nominal 44.45mm (1-3/4in.) thickness.** 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.

Environmental Indicators		Unit	Particleboard Core (PC) (per door)	8300 Particleboard Core (PC) (per door)	Structural Composite Lumber Core (SCL) (per door)
TRACI 2.1					
GWP[(1)(3)]	Global warming potential based on IPCC 2007 (AR4)	kg CO_2 eq.	4.38E+01	4.70E+01	5.24E+01
GWP[(2)(3)]	Global warming potential based on IPCC 2013 (AR5)	kg CO_2 eq.	4.40E+01	4.71E+01	5.26E+01
AP	Acidification potential	kg SO_2 eq.	3.57E-01	3.77E-01	3.97E-01
EP	Eutrophication potential	kg N eq.	1.26E-01	1.23E-01	9.36E-02
SFP	Smog formation potential	kg O_3 eq.	5.69E+00	6.55E+00	9.01E+00
ODP	Ozone depletion potential	kg CFC-11 eq.	4.21E-06	4.19E-06	3.56E-06
Total primary energy consumption					
$NRPE_F$[(4)]	Non-renewable fossil	MJ (HHV)	6.57E+02	7.21E+02	8.70E+02
$NRPE_N$[(4)]	Non-renewable nuclear	MJ (HHV)	2.14E-03	2.25E-03	3.57E-03
RPE_O[(4)]	Renewable (solar, wind, hydroelectric, and geothermal)	MJ (HHV)	1.90E+02	2.00E+02	2.04E+02
RPE_B[(4)]	Renewable (biomass)	MJ (HHV)	1.92E+02	2.48E+02	4.34E+02
Material resources consumption					
NRMR[(5)]	Non-renewable material resources	kg	2.88E+00	2.96E+00	2.81E+00
RMR[(6)]	Renewable material resources	kg	5.20E+01	5.58E+01	6.12E+01
FW[(7)]	Use of net fresh water resources	L	1.34E+04	1.40E+04	1.92E+04
Waste generated					
NHWD[(8)]	Non-hazardous waste generated	kg	6.84E+00	7.41E+00	1.04E+01
HWD[(9)]	Hazardous waste generated	kg	3.26E-01	3.59E-01	4.44E-01

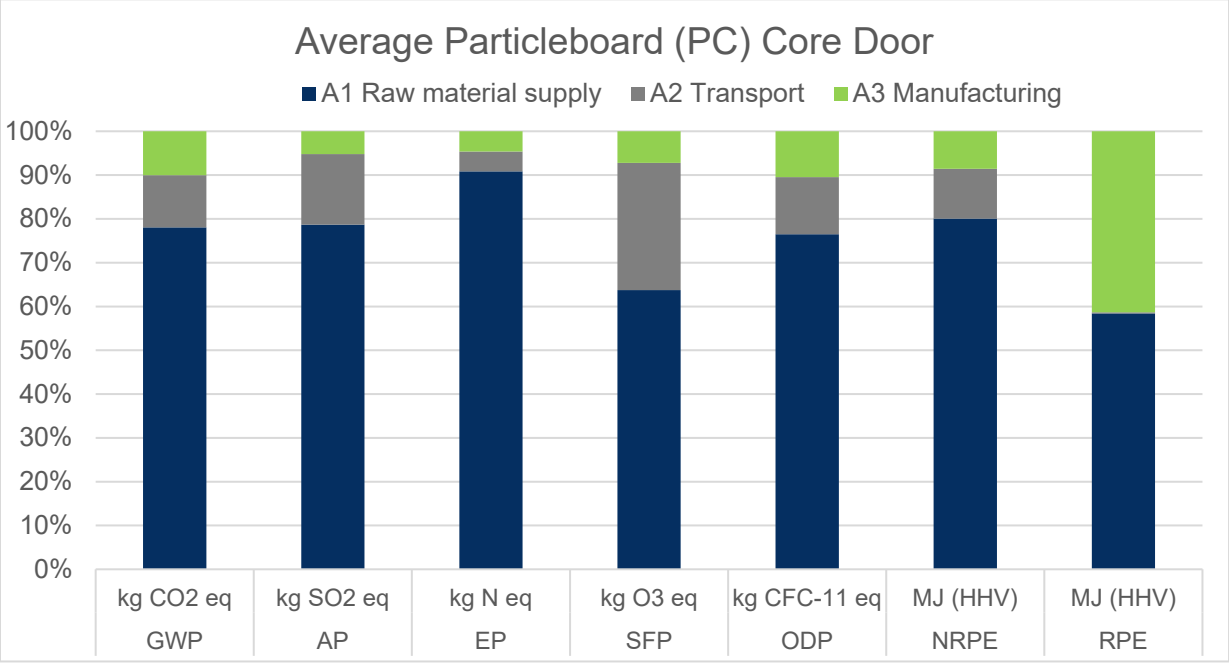
(1): Calculated as per U.S EPA TRACI 2.1 [14], OpenLCA v 1.10.3 [15].
(2): TRACI v2.1 indicator updated with IPCC 2013 AR5.
(3): Biogenic carbon dioxide emissions and removals are not considered, i.e., their characterization factor is 0 kg CO_2 eq./kg CO_2.
(4): Values obtained using the CED HHV methodology.
(5): Calculated based on wood content of raw materials.
(6): Calculated based on non-renewable organic content of raw materials.
(7): Represents the use of net fresh water calculated from life cycle inventory results, i.e., water consumption using ReCiPe Midpoint (E) 2016.
(8): Calculated from life cycle inventory results, based on datasets marked as "hazardous," “spent nuclear fuel” and EPD values.
(9): Calculated from life cycle inventory results and EPD values, based on waste that is neither "hazardous" nor "radioactive."

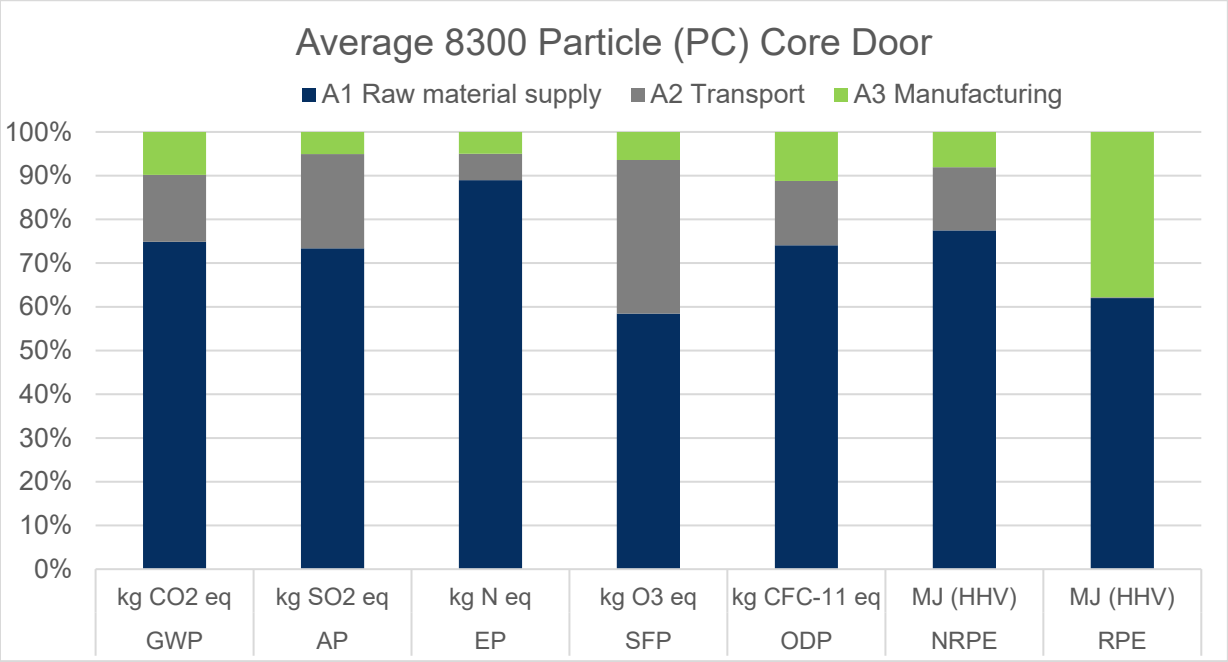
4.2. CONTRIBUTION ANALYSIS

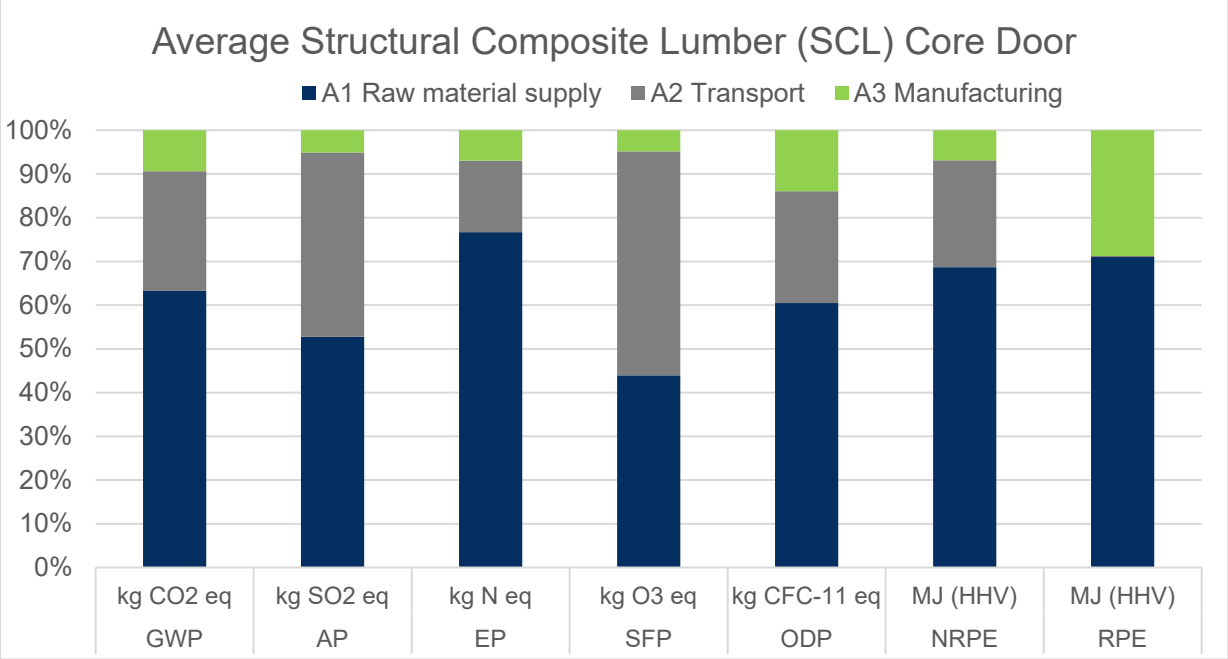
Raw material supply (A1) has the highest contribution to all environmental impact categories when it comes to the average Particleboard Core Door and the average 8300 Particleboard Core Door. For the average Structural Composite Core Door, the raw material supply (A1) has the highest contribution to 4 out of 5 environmental impact categories. Transport (A2) of the raw materials is the main contributor to smog formation potential.

Amongst all the raw materials, laminated strand lumber travels the longest distance by truck, i.e., 2,503 km. For each additional kilogram of laminated strand lumber transported, there is a linear increase of the process contribution. Thus, the higher the weight of laminated strand lumber in the products, the larger the related total transport contribution. The average Particleboard Core Door, 8300 Particleboard Core Door and Structural Composite Core Door contain 7.45 wt.%, 22.82 wt.% and 70.16 wt.%, respectively. As can been seen in the graphs shown below, the contribution of transport (A2) of the raw materials increases as the portion of laminated strand lumber (LSL) in the products increases.

Otherwise, for total renewable and non-renewable primary energy consumption (RPE, NRPE), raw material supply (A1), for all door types, is the main contributor.




Average 8300 Particle (PC) Core Door
A1 Raw material supply
A2 Transport
A3 Manufacturing
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
kg CO2 eq
GWP
kg SO2 eq
AP
kg N eq
EP
kg O3 eq
SFP
kg CFC-11 eq
ODP
MJ (HHV)
NRPE
MJ (HHV)
RPE


Average Structural Composite Lumber (SCL) Core Door
A1 Raw material supply
A2 Transport
A3 Manufacturing
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
kg CO2 eq
GWP
kg SO2 eq
AP
kg N eq
EP
kg O3 eq
SFP
kg CFC-11 eq
ODP
MJ (HHV)
NRPE
MJ (HHV)
RPE

5. ADDITIONAL ENVIRONMENTAL INFORMATION

5.1. REGULATED HAZARDOUS SUBSTANCES

No substances required to be reported as hazardous are associated with the production of these products.

5.2. DANGEROUS SUBSTANCES

No dangerous substances are known to be associated with the production of these products.

5.3. CARBON SEQUESTRATION

LAMBTON Doors products are made of wood and therefore contain sequestered carbon at the production gate.

Calculation parameters	Particleboard Core (PC) Doors	8300 Particleboard Core (PC) Doors	Structural Composite Lumber Core (SCL) Doors
	Per Door	Per Door	Per Door
Wood, oven dry mass (kg)	41.92	45.38	49.92
Carbon content of wood (%)	50%	50%	50%
Carbon content of wood (kg))	20.96	22.69	24.96
CO_2 sequestration (kg CO_2 eq.)	-76.85	-83.20	-91.52

5.4. FSC CERTIFICATION

LAMBTON Doors can supply doors with FSC-certified core wood panels in their FS door series. LAMBTON Doors' FSC Certification information details can be found at https://info.fsc.org/certificate.php under the License Code FSC-C001968.

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EPD

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