Hardwood Flooring: Solid Construction,

Hardwood Flooring: 7/16 Engineered Construction,

Hardwood Flooring: Solid 2-ply Engineered Construction

Lauzon Hardwood Flooring

ENVIRONMENTAL PRODUCT DECLARATION

ISO 14025:2006

Lauzon Hardwood Flooring is pleased to present this environmental product declaration (EPD) for their solid construction flooring, 7/16 engineered construction flooring and Solid 2-ply engineered construction flooring. This EPD was developed in compliance with ISO 14025 as well as ISO 21930:2017 and has been verified by Jean-François Ménard, CIRAIG.
The LCA and the EPD were prepared by Vertima Inc. The EPD includes cradle-to-grave life cycle assessment (LCA) results.

For more information about Lauzon Hardwood Flooring, visit
https://lauzonflooring.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

#5911-4439
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: Flooring EPD Requirements. Version 2.0. (UL Environment, December 2018 to December 2023).		
The PCR review was conducted by:	*Jack Geibig, Chair Ecoform* *jgeibig@ecoform.com*	*Thomas Gloria, PhD Industrial Ecology Consultants* *t.gloria@industrial-ecology.com*	*Thaddeus Owen* *hiper4m@gmail.com*

EPD GENERAL INFORMATION		
Program Operator	CSA Group 178 Rexdale Blvd, Toronto, Ontario, Canada M9W 1R3 www.csagroup.org	
Declared Product	**Solid Construction Flooring** **7/16 Engineered Construction Flooring** **Solid 2-ply Engineered Construction Flooring**	
EPD Registration Number #5911-4439	**EPD Date of Issue** 2022/03	**EPD Period of Validity**[1] 2022/03 - 2027/03
EPD Recipient Organization	Lauzon Hardwood Flooring 2101 côte des Cascades Papineauville, Quebec, J0V 1R0, Canada www.debourgh.com	LAUZON
EPD Type/Scope and Functional Unit Product-specific cradle-to-grave EPD with Product specific type III, Cradle-to-Grave EPD with functional unit of 1 m² of floor covering for a period of 75 years.		**Year of Reported Manufacturer Primary Data** December 2019 - November 2020
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: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report," v3.2 (December 2018), which is based on based on ISO 21930:2017 and CEN Norm EN 15804 (2012), serves as the core PCR, Part B: Flooring EPD Requirements. Version 2.0. ☐ Internal ☒ External	Jean-François Ménard, (CIRAIG).

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. 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 module 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

Lauzon Flooring is a manufacturer and supplier of prefinished solid and engineered wood floors. Their flooring products are produced entirely in North America, where forest management and manufacturing are both subject to the strictest environmental laws and regulations in the world. Lauzon Flooring owns and manages forest land spanning two million acres in the Outaouais. Lauzon's sound forest management, based on a 25-year cycle, guarantees a secure supply of renewable raw materials of the best quality. During the 25-year cycle, Lauzon uses less than 30% of the trees on an area of 2.5 acres to promote the growth of young shoots. By allowing younger, more vigorous trees to grow, their fallow cultivation method and gardening processes ensure that the forest is kept in the best possible condition for generations to come.

Lauzon Flooring is committed the monitoring of the supply sources to enhance compliance with legal, environmental, and policy requirements associated with sustainable forest management. As part of this commitment, Lauzon supports socially and environmentally responsible forest management initiatives.

2.1. PRODUCT DESCRIPTION

The products studied in this report are Lauzon flooring products, specifically: Hardwood Flooring: Solid Construction; Hardwood Flooring: 7/16 Engineered Construction and Hardwood Flooring: Solid 2-Ply Engineered Construction.

2.1.1. Product specification

The Hardwood Flooring: Solid Construction product is a one-piece wood plank. The thickness of the solid construction is ¾" (19 mm), with widths ranging from 3¼" (82.5 mm) and 4¼" (108 mm) and variable lengths. The Hardwood Flooring: 7/16 Engineered Construction product is made from 3-mm-thick hardwood plank glued onto Douglas Fir plywood with emulsion polymer isocyanate (EPI) adhesive. The 7/16 Engineered Construction product has a thickness of 11 mm with widths ranging from 3¼" (82.5 mm) and $5^{3/16}$" (132 mm) and variable lengths. The Hardwood Flooring: Solid 2-Ply Engineered Construction product is a 5-mm-thick piece of hardwood glued onto a softwood wooden slat. The softwood used comes from the group of spruce, pin and fir (SPF). Polyurethane (PUR) adhesive is used. The Solid 2-Ply Engineered Construction product is ¾" (19 mm) thick, with widths between $3^{1/8}$" (79.4 mm) and $4^{1/8}$"(104.8 mm) and variable lengths. Lauzon flooring products are used for both residential and non-residential applications, and is commonly installed over wood or concrete subfloors. It can also be used for wall applications. The construction and finish are both durable and beautiful and provide a lifetime structural warranty and a 35-year finish warranty. Figure 1 presents a room scene featuring Lauzon flooring. The primary United Nations Standard Products and Services Code (UNSPSC) code for this wood flooring product is 30161702 and the Construction Specifications Institute (CSI) code is 09 64 00.

Figure 1: Representation of room scene featuring Lauzon flooring.

2.1.2. Product average

The weighted average profile of each m^2 of product is calculated based on annual (December 1, 2019 to November 28, 2020) production data on the three flooring products.

2.1.3. Product-specific EPD

In the context of a growing popularity of LEED certifications, developing Type III EPDs would allow Lauzon Hardwood Flooring to increase the visibility of its products. This EPD is specific to Lauzon Hardwood Flooring. It has been developed according to ISO 21930 - 2017 and ISO 14025 for all three Lauzon Hardwood Flooring products studied: Hardwood Flooring: Solid Construction; Hardwood Flooring: 7/16 Engineered Construction; and Hardwood Flooring: Solid 2-Ply Engineered Construction.

2.2. PRODUCT APPLICATION

All Lauzon Hardwood Flooring products can be used in residential and non-residential applications, installed over wood or concrete subfloors, and used as wall applications.

2.3. DECLARATION OF METHODOLOGICAL FRAMEWORK

This LCA is a cradle-to-grave study. For this analysis, the attributional approach was followed and impacts of infrastructure have been excluded.

Life cycle stages included in the analysis are production (A1, A2 and A3), construction (A4 and A5), use (B1-B7) and end-of-life (C1-C4). In accordance with the PCR, the reference service life (RSL) is 75 years. The study was verified by a third party. According to the UL Environment PCR – Part A [1], 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 system boundaries. No known flows are deliberately excluded from this EPD. According to PCR section 3.10 allocation rules, mass should be used as the primary basis for co-product allocation. OpenLCA software v1.10.2, an open-source software, was used to calculate the inventory and to assess potential environmental impacts associated with the inventoried emissions.

2.3.1. Technical requirements

For specific properties and performance data of all of Lauzon Hardwood Flooring products, please consult the following link: https://lauzonflooring.com/products

The construction and finish are both durable and beautiful, and provide a lifetime structural warranty and a 35-year finish warranty. Table 1 presents technical data for the products under study.

Table 1: Lauzon Hardwood Flooring technical data.

Material	Hardwood Flooring			Unit
	Solid Construction	7/16 Engineered construction	Solid 2-Ply Engineered Construction	
Thickness	19.00	11.00	19.00	mm
Width range	82.5-108	82.5-132	79.4-104.8	mm
Product average weight	14.14	6.97	11.28	kg/m^{2}covered

2.4. MARKET PLACEMENT/APPLICATION RULES

As Lauzon flooring products are for indoor use, and all products are tested for VOC and formaldehyde emissions. Emission tests were performed by the Berkeley analytical laboratory and HPVA laboratories. The results indicates that emissions were ≤½ Chronic REL and ≤9.0 µg/m^3 for VOC and formaldehyde, respectively. The tests were performed in accordance with the following standards:

- CDPH/EHLB/Standard Method V1.2-2017

- ASTM D6007-14: Standard Test Method for Determining Formaldehyde Concentrations in Air from Wood Products Using a Small-Scale Chamber

2.5. MATERIAL COMPOSITION

The weighted average profile of each m^2 of product is calculated based on annual (December 1, 2019 to November 28, 2020) production data on the three flooring products. A summary of the values compiled are presented in **Table 2**.

Table 2: Composition of 1 m^2 of each Lauzon Hardwood Flooring.

Material	Lauzon Hardwood Flooring		
	Solid Construction	7/16 Engineered Construction	Solid 2-Ply Engineered Construction
Hardwood	99.00%	35.04%	35.04%
Softwood	0.00%	0.00%	63.01%
Plywood	0.00%	63.01%	0.00%
EPI adhesive	0.00%	1.32%	0.00%
PUR adhesive	0.00%	0.00%	1.32%
UV Finish	1.00%	0.63%	0.63%
Total	**100.00%**	**100.00%**	**100.00%**

2.6. MANUFACTURING

The manufacturing of Lauzon hardwood flooring is a seven-step process: drying, sawing, conditioning, planing, gluing, milling, and finishing. Drying starts with rough lumber received at the flooring manufacturing plant gate. The hardwood species used are Hard Maple, Red Birch, Yellow Birch, Red Oak, Black Walnut, and Hickory. Dried lumber then undergoes ripping, chopping, and resawing. The wood planks are conditioned at 8%-10% of moisture content. The conditioned planks are then sanded and moulded for the solid construction flooring. Next, they are either sanded and glued on plywood and moulding for 7/16 Engineered Construction Flooring, or sanded and glued on softwood slats and moulding for Solid 2-Ply Engineered Construction Flooring, to produce unfinished wood flooring planks. At the end of the manufacturing process, flooring planks are finished with the application of a stain and protective coating. Figure 2 shows the flow diagram of the production process for Lauzon hardwood flooring, according to the process scope of the study and in accordance with ISO 21930 [2].

Finished Lauzon hardwood flooring planks are packaged in cardboard boxes and placed on wood pallets. The package is then loaded onto a truck for delivery.

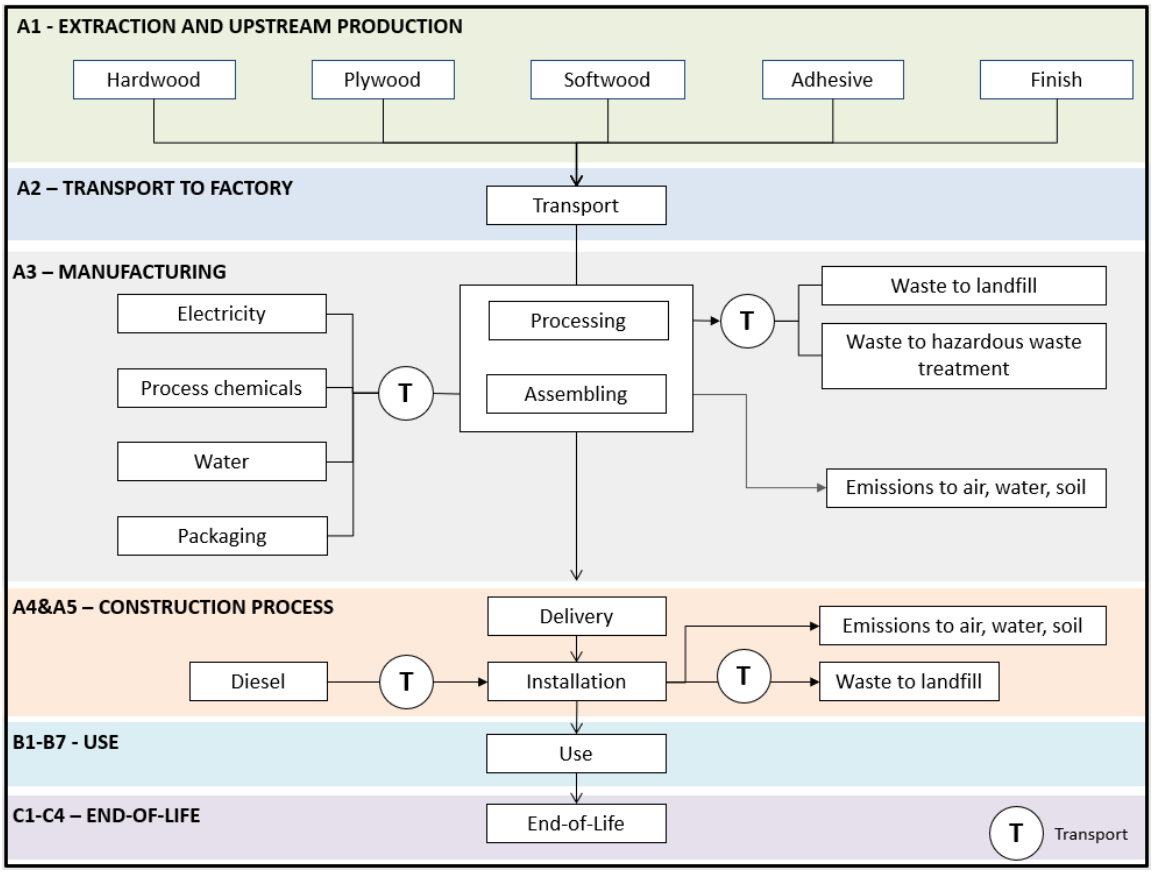

Figure 2: Flow diagram of the Lauzon flooring production process.

2.7. PACKAGING

All Lauzon Hardwood Flooring is packaged using the materials presented in Table 3.

Table 3: Amount of packaging materials used per functional unit (FU) of Lauzon Hardwood Flooring.

Materials	Hardwood Flooring			Unit
	Solid Construction	7/16 Engineered Construction	Solid 2-Ply Engineered Construction	
Softwood pallets	6.54E-02	3.22E-02	5.21E-02	m^3
Hardwood rafter	3.58E-01	1.76E-01	2.85E-01	m^3
PET membrane	1.63E-02	8.05E-03	1.30E-02	kg
Polyester strapping	1.10E-02	5.41E-03	8.76E-03	kg

Materials	Hardwood Flooring			Unit
	Solid Construction	7/16 Engineered Construction	Solid 2-Ply Engineered Construction	
Polypropylene	C.66E-03	8.17E-04	1.32E-03	kg
Corrugated cardboard box	3.66E-01	1.80E-01	2.92E-01	kg

2.8. TRANSPORTATION

Lauzon's products are distributed throughout North America. Products are transported by truck from the factory to the installation site.

2.9. PRODUCT INSTALLATION

The manufacturer's installation instructions should be followed [3]. Before installing the flooring product, inspecting the environmental conditions (relative humidity between 35% and 55%) and subfloor is recommended. Appropriate subfloor includes lumber, plywood, OSB (Oriented Strand Board), or concrete. The subfloor must be clean, flat, smooth, and free of debris of any kind. Fasteners (nails or staples) or glue is used to install the flooring. When fasteners are used on a wood subfloor, using a vapor barrier membrane is recommended. The machinery and tools used include a saw, hammer, nails or staple gun, pencil, square bevel tool, tape measure, crowbar, spacer, and tapping block. During installation, personal protective equipment (dust masks or respirators, ear plugs, and safety glasses) must be worn to protect the installer's respiratory system, ears, and eyes from excessive exposure to sawdust. In addition, the use of knee pads and rubber gloves is recommended.

2.10. USE CONDITIONS

Every Lauzon hardwood flooring product is a premium quality product, built for stability and longevity, but not indestructible. Wood is a natural and organic material and can undergo irreparable damage if not treated properly and given periodic care and maintenance. Once a Lauzon hardwood flooring product has been installed and in use, three important conditions must be respected: proper cleaning, protection, and humidity control. To get the most enjoyment out of a Lauzon hardwood flooring product, proper care and maintenance guidelines should be followed at all times. Maintenance does not require the use of special products except for a mop and cleaning product recommended by the manufacturer.

2.11. PRODUCT REFERENCE SERVICE LIFE AND BUILDING ESTIMATED SERVICE LIFE

According to the part A of the PCR, the estimated service life (ESL) of the building is assumed to be 75 years. There is no reference service life (RSL) for wood flooring in the ULE PCR [1]. Since wood flooring is expected to last as long as the building, the reference service life of Lauzon flooring is assumed to be 75 years. Based on Lauzon hardwood flooring information and public documentation published on its website, the structural (wood) component is covered by a lifetime warranty, while the finishing component is covered by a 35-year warranty. During the ESL of the building, the finishing coat of the flooring product is assumed to require replacement 1.1 times.

2.12. RE-USE PHASE

There is no re-use, recycling, or energy recovery with respect to Lauzon hardwood flooring products.

2.13. DISPOSAL

This LCA study assumes disposal of flooring at the end of its service life, in accordance with construction, renovation, and demolition (CRD) waste disposal practices commonly followed in North America. Inspired by UL Environment PCR, Part A, Tables 2 and 3, it was assumed that flooring products are 100% landfilled [1]. With respect to landfills, based on a conservative timeframe of 100 years due to the lack of data, it was considered that 1.5% of the wood decomposes, based on the ecoinvent dataset. The emission of landfill gases into the atmosphere are mainly composed of methane and carbon dioxide, assuming a ratio of 50:50. This ratio is applied in the LCA, along with the assumption that landfill gas consists of equal parts carbon dioxide and methane. Based on the same ecoinvent dataset, 62% of methane goes directly to the atmosphere and 38% is captured for energy production. It was assumed that combustion of methane was complete combustion.

3. LCA CALCULATION RULES

3.1. FUNCTIONAL UNIT

The selected functional unit (FU) for this study according to the UL PCR is 1 m² of floor covering by Lauzon hardwood flooring products for a period of 75 years. **Table 4** presents all products targeted by this report and their respective FU.

Table 4: Functional Unit of products studied.

Materials	Hardwood Flooring			Unit
	Solid Construction	7/16 Engineered Construction	Solid 2-ply Engineered Construction	
Functional Unit	1	1	1	m^2
Average Weight	14.14	6.97	11.28	Kg/m^2 covered

3.2. SYSTEM BOUNDARIES

According to UL Environment's PCR [5], the LCA modelling covers cradle-to-grave stages. All life cycle stages are included in the analysis: Production, Construction, Use, and End-of-life. The Production stage included A1) Extraction and upstream production, A2) Raw materials transportation to the manufacturing plant and A3) Manufacturing of Lauzon's products. The Construction stage included A4) Transportation of the flooring product from the factory to the building site and A5) Installation. The Use stage included modules B1 to B7. The End-of-life (EoL) stage included modules C1 to C4. **Table 5** presents the life cycle stages and their modules included in the system boundaries analysed in accordance with ISO 21930 [2].

Table 5: 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
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	X	X	X	X	X	X	X	X	X	X	X	X	X

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

Extraction and upstream production (module A1): This stage includes the extraction and transformation of raw materials needed to produce Lauzon Hardwood Flooring products (solid hardwood flooring and engineered hardwood flooring). All chemicals used in the process have been taken into account in the inventory.

Raw materials transportation to flooring factory (module A2): This stage includes the transportation of raw materials from suppliers to Lauzon Hardwood Flooring product factories in Maniwaki, St-Norbert, and Papineauville (Quebec, Canada).

Manufacturing of flooring (module A3): This stage includes water and energy (electricity, diesel, and propane) consumption for manufacturing processes (drying, resawing, planing, gluing, sanding, and finishing). Chemicals used in the process and for water treatment have been considered, as well as their transport to the plant. Hazardous waste treatment has been included as well.

The manufacturing processes of Lauzon Hardwood Flooring products generates losses. These losses have been determined by weight and are considered as waste. Finally, the production of packaging materials used to prepare the products for shipment are covered by this stage.

Transport to installation site (module A4): Products are transported by truck from the factory to installation sites in North American locations.

Product installation (module A5): To install Lauzon Hardwood Flooring, glue, nails, and energy are used depending to the type of subfloor. In this module, the waste generated includes wood content and packaging. Module A5 includes 5% of the A1, A2, A3, and A4 modules.

Maintenance (module B2): Lauzon Hardwood Flooring products require maintenance. A common and periodical maintenance schedule should be observed during the use stage. Manufacturer recommendations correspond to the standard of the wood flooring industry.

Transport to waste processing and/or disposal (module C2): Transport distance (161 km) from the demolition site to the landfill site is considered in this module.

Disposal of waste (module C4): A large majority of Lauzon Hardwood Flooring is distributed in North America; hence, end-of-life scenarios are modeled according to the North American context.

3.3. ESTIMATION AND ASSUMPTIONS

During the use stage, the resources used on rare occasions are negligible for modules B1, B3, and B5. Since hardwood flooring lasts as long as the building itself, the RSL of the product is equal to ESL of the building. As required in the PCR, the ESL of the building is 75 years. Based on this, no replacements are necessary during the service life of the building. During the service life of the building, the product doesn't require operational energy (B6) or water use (B7). Based on this information, the environmental impacts of modules B1, B3, B4, B5, B6, and B7 are therefore considered as nil. For cleaning purposes, the energy, wood flooring cleaning product, and finish used in module B2 are included as inputs in the analysis.

For the EoL stage, there is no energy consumption for the demolition module (C1) because it is generally a manual operation. In the case of C3, the waste goes directly from the building site to the landfill site, with no energy consumed at the sorting stage. Module D is excluded from the system boundaries.

The average transportation distance for the delivery of Lauzon's products in North America area was assumed to be 800 km based on the PCR. The transportation distance from the building demolition site to the landfill site was assumed to be 161 km based on the PCR [5].

3.4. CUT-OFF RULES

According to the PCR, which follows ISO 21930:2017 directives, cut-off rules shall not be applied in order to hide data. Any application of the criteria for the exclusion of inputs and outputs shall be documented.

In this EPD, any material input less than 1% of the total mass of the final product, with no significant environmental impact, is not included in the scope of the study. However, material inputs greater than 1% of the total mass of the final product are included within the scope of the study. The cumulative material inputs and environmental impacts less than 5% of the total weight of the FU are excluded. No known flows are deliberately excluded from this EPD.

3.5. DATA SOURCES

Inventory data was collected from Lauzon manufacturing plants located in Papineauville, St-Norbert, and Maniwaki in the province of Quebec (Canada), using a life cycle inventory (LCI) questionnaire. All data collected from the Lauzon plants (primary data) was used in the analysis.

When primary data was not available, unit processes were selected from the ecoinvent database v3.7 or from the US LCI database, the most comprehensive LCI databases currently available [6, 7].

When ecoinvent unit processes were not available specifically for North America or Quebec, they were adapted by replacing their electricity grid with the ecoinvent process "Market for Electricity, medium or Low voltage – CA QC," or by "Market group for Electricity, Medium or Low Voltage - RNA".

3.6. DATA QUALITY

The primary data obtained from the manufacturer is representative of the current technologies and materials used by this company. As primary data was collected directly from the plants where Lauzon Hardwood Flooring products are manufactured, it is 100% representative of the technologies in use and of the geographical areas. The primary data was collected to be representative of the full production year (December 2019 to November 2020). The geographic area coverage of primary data was considered to be excellent. Representativeness and completeness of the data collected was very good quality. Secondary data was used only for upstream processes. For some processes, the ecoinvent v3.7 database provided representative data for a North American and Quebec context. These processes were used first. When necessary, the grid mix was changed to the grid mix of the province where production took place.

3.7. PERIOD UNDER REVIEW

The period under review is the year production from December 2019 to November 2020.

3.8. 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 [8].

According to PCR section 3.10 allocation rules, mass should be used as the primary basis for co-product allocation. In this study, mass allocation was used for input and output flows [5]. Allocation was performed based on the yearly production mass of each product under study. Lauzon provided all data relative to energy consumption (electricity, heat, diesel, and propane) for all products.

Material flows undergoing recycling/reuse processes are excluded from the system boundary. A cut-off approach was used because recycled/reused material is part of the raw material preparation of another product system.

3.9. COMPARABILITY AND BENCHMARKING

PCRs for flooring allow EPD comparability only when all life cycle stages are considered. However, the comparison of specific EPDs from different manufacturers should be undertaken with caution, because assumptions, considerations, data sources, databases used, non-life cycle inventory data such as transportation distance and mode, and assessment tools and methods used, impact the final results. In the absence of knowledge of these specific variabilities, comparing EPDs is not recommended.

4. LIFE CYCLE ASSESSMENT SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

Table 6: Transport from gate to installation site (A4)

Name	Truck	Unit
Fuel type	Diesel	
Litres of fuel	-	l/100 km
Vehicle type	Transport truck	-
Transport distance	800	Km
Capacity utilization (including empty runs, mass-based)	-	%
Weight of products transported (if gross density not reported)	-	kg
Capacity utilization volume factor (factor=1 or <1 or ≥1 for compressed or nested packaging products)	1	-

Table 7: Installation (A5)

Name	Solid Construction	7/16 Engineered Construction	Solid 2-Ply Engineered Construction	Unit
Ancillary materials – Adhesive	1.10E-01	1.10E-01	1.10E+00	Kg/m^2
Ancillary materials – Fasteners	7.00E-02	7.00E-02	0.00E+00	Kg/m^2
Net freshwater consumption	0	0	0	Kg/m^2
Product loss per functional unit	5	5	5	%
Waste materials at the construction site before waste processing, generated by product installation	7.07E-01	3.48E-01	5.64E-01	Kg/m^2
Packaging waste	2.43E+02	1.21E+02	1.95E+02	Kg/m^2
Biogenic carbon contained in packaging	1.22E-00	6.07E-01	9.77E-01	Kg CO_2
VOC emissions	NA	NA	NA	$\mu g/m^3$

Table 8: Reference Service Life (RSL)

Name	Value	Unit
RSL	75	Years
Declared product properties (at the gate) and finishes, etc.	-	Units as appropriate
Design application parameters (if instructed by the manufacturer), including references to the appropriate practices and application codes	Installation based on manufacturer's recommendations	-
An assumed quality of work, when installed in accordance with the manufacturer's instructions	Accepted industry standard	-
Indoor environment, (if relevant for indoor applications), e.g temperature, moisture, chemical exposure	Normal building operating conditions	-
Use conditions, e.g. frequency of use, mechanical exposure	Normal building operating conditions	-
Maintenance, e.g. required frequency, type and quality of replacement components	Maintenance based on manufacturer's recommendations	-

Table 9: Maintenance (B2)

Name	Value	Unit
Maintenance process information	Maintenance based on manufacturer's recommendations	
Maintenance cycle	900	Cycles/RSL
Maintenance cycle	900	Cycles/ESL
Net freshwater consumption specified by water source and fate (e.g., X m3 river water evaporated, X m3 city water disposed to sewer)	0.876	Litre/ Year/m^2
Ancillary materials specified by type (e.g. cleaning agent)	2.96E-02	kg/Year/m^2
Energy input, specified by activity, type and amount	0.031	kWh/Year/m^2
Direct emissions to ambient air, soil and water	0	kg

Table 10: End-of-Life (C1-C4)

Name		Solid Construction	7/16 Engineered Construction	Solid 2-Ply Engineered Construction	Unit
Assumptions for scenario development (description of deconstruction, collection, recovery, disposal method and transportation)		Lauzon's product is manually removed			
Collection process (specified by type)	Collected separately	0.00E+00	0.00E+00	0.00E+00	Kg
	Collected with mixed construction waste	1.41E+01	6.97E+00	1.13E+01	kg
Recovery (specified by type)	Reuse	0.00E+00	0.00E+00	0.00E+00	kg
	Recycling	0.00E+00	0.00E+00	0.00E+00	kg
	Landfill	0.00E+00	0.00E+00	0.00E+00	kg
	Incineration	0.00E+00	0.00E+00	0.00E+00	kg
	Incineration with energy recovery	0.00E+00	0.00E+00	0.00E+00	kg
	Energy conversion (specified by efficiency rate)	0.00E+00	0.00E+00	0.00E+00	%

Name		Solid Construction	7/16 Engineered Construction	Solid 2-Ply Engineered Construction	Unit
Disposal (specified by type)	Product or material for final deposition	1.41E+01	6.97E+00	1.13E+01	kg
Biogenic carbon removal (excluding packaging)		-4.71E+01	-2.25E+01	-3.43E+01	Kg CO2

5. LIFE CYCLE ASSESSMENT RESULTS

5.1. RESULTS TABLES

According to the PCR, life cycle assessment results must be presented per FU. It should be noted that LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds safety margins, or risks.

Table 11: Solid Construction Flooring Life Cycle Impact Assessment Results

Impact Categories	Indicators	Units	Production Stage	Construction Stage		Use Stage							End-of-Life Stage				Total
			A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	
Global Warming Potential	IPCC GWP 100a (2)	kg CO2 eq	7.55E+00	1.13E+00	1.22E+00	0.00E+00	3.93E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.46E-01	0.00E+00	1.06E+00	1.51E+01
Biogenic Carbon Removals	BCR (3)	kg CO2	-4.10E+01	0.00E+00	-2.05E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.30E+01
Biogenic Carbon Emissions	BCE (3)	kg CO2	1.49E+01	0.00E+00	8.74E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E+00	1.70E+01
Ozone Depletion Potential	ODP (1)	kg CFC-11 eq	8.26E-07	4.06E-08	1.41E-07	0.00E+00	4.86E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.87E-09	0.00E+00	5.04E-08	1.55E-06
Acidification Potential	AP (1)	kg SO2 eq	7.15E-02	6.86E-03	7.25E-03	0.00E+00	3.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.34E-03	0.00E+00	1.43E-03	1.19E-01
Eutrophication Potential	EP (1)	kg N eq	2.28E-02	3.38E-04	1.09E-02	0.00E+00	4.15E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.41E-05	0.00E+00	1.02E-01	1.78E-01
Smog Formation Potential	SFP (1)	kg O3 eq	1.84E+00	2.18E-01	1.50E-01	0.00E+00	2.26E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.21E-02	0.00E+00	2.77E-02	2.50E+00
Abiotic Resource Depletion Potential of Non-renewable (fossil) energy resources (ADPfossil)	ADPfossil (1)	MJ surplus	1.21E+01	2.33E+00	2.12E+00	0.00E+00	5.40E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.09E-01	0.00E+00	4.68E-01	2.29E+01

Table 12: 7/16 Engineered Construction Flooring Life Cycle Impact Assessment Results

Impact Categories	Indicators	Units	Production Stage	Construction Stage		Use Stage							End-of-Life Stage				Total
			A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	
Global Warming Potential	IPCC GWP 100a (2)	kg CO2 eq	6.85E+00	5.85E-01	1.08E+00	0.00E+00	3.93E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-01	0.00E+00	5.24E-01	1.31E+01
Biogenic Carbon Removals	BCR (3)	kg CO2	-2.13E+01	0.00E+00	-1.07E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.24E+01
Biogenic Carbon Emissions	BCE (3)	kg CO2	7.34E+00	0.00E+00	4.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.01E-01	8.38E+00
Ozone Depletion Potential	ODP (1)	kg CFC-11 eq	8.40E-07	2.11E-08	1.32E-07	0.00E+00	4.86E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.36E-09	0.00E+00	2.49E-08	1.51E-06
Acidification Potential	AP (1)	kg SO2 eq	5.30E-02	3.56E-03	5.89E-03	0.00E+00	3.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.60E-04	0.00E+00	7.06E-04	9.50E-02
Eutrophication Potential	EP (1)	kg N eq	2.25E-02	1.76E-04	6.56E-03	0.00E+00	4.15E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.15E-05	0.00E+00	5.04E-02	1.21E-01
Smog Formation Potential	SFP (1)	kg O3 eq	1.24E+00	1.13E-01	1.11E-01	0.00E+00	2.26E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.07E-02	0.00E+00	1.37E-02	1.72E+00
Abiotic Resource Depletion Potential of Non-renewable (fossil) energy resources (ADPfossil)	ADPfossil (1)	MJ surplus	1.22E+01	1.21E+00	1.97E+00	0.00E+00	5.40E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.50E-01	0.00E+00	2.32E-01	2.12E+01

Table 13: Solid 2-Ply Engineered Construction Flooring Life Cycle Impact Assessment Results

Impact Categories	Indicators	Units	Production Stage	Construction Stage		Use Stage							End-of-Life Stage				Total
			A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	
Global Warming Potential	IPCC GWP 100a (2)	kg CO2 eq	6.87E+00	9.10E-01	6.57E+00	0.00E+00	3.62E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.97E-01	0.00E+00	8.49E-01	1.90E+01
Biogenic Carbon Removals	BCR (3)	kg CO2	-3.53E+01	0.00E+00	-1.76E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.70E+01
Biogenic Carbon Emissions	BCE (3)	kg CO2	1.19E+01	0.00E+00	6.47E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.20E-01	1.35E+01
Ozone Depletion Potential	ODP (1)	kg CFC-11 eq	8.59E-07	3.28E-08	8.73E-07	0.00E+00	4.16E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.08E-09	0.00E+00	4.04E-08	2.23E-06
Acidification Potential	AP (1)	kg SO2 eq	5.71E-02	5.53E-03	3.12E-02	0.00E+00	2.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E-03	0.00E+00	1.14E-03	1.22E-01
Eutrophication Potential	EP (1)	kg N eq	2.01E-02	2.73E-04	2.38E-02	0.00E+00	2.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.12E-05	0.00E+00	8.18E-02	1.52E-01
Smog Formation Potential	SFP (1)	kg O3 eq	1.49E+00	1.76E-01	4.92E-01	0.00E+00	1.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.36E-02	0.00E+00	2.22E-02	2.40E+00
Abiotic Resource Depletion Potential of Non-renewable (fossil) energy resources (ADPfossil)	ADPfossil (1)	MJ surplus	1.14E+01	1.88E+00	1.29E+01	0.00E+00	4.28E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.06E-01	0.00E+00	3.75E-01	3.13E+01

(1): Calculated as per U.S EPA TRACI 2.1 with OpenLCA v 1.10.2 software.

(2): GWP 100a, excludes biogenic CO2 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). Results of biogenic carbon are presented in a separate line.

(3): A negative represents biogenic carbon remove to the atmosphere.

Table 14: Solid Construction Flooring Life Cycle Inventory Results

Resource use																
Parameter	Unit	Production stage	Construction stage		Use stage							End-of-life stage				Total
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	
RPR_E (4)	MJ, LHV	2.59E+02	2.30E-02	1.51E+01	0.00E+00	5.47E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.03E-03	0.00E+00	2.69E+02	5.49E+02
RPR_M (5)*	MJ, LHV	3.33E+02	0.00E+00	1.63E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.69E+02	6.18E+02
$NRPR_E$ (6)	MJ, LHV	1.01E+02	1.67E+01	1.65E+01	0.00E+00	6.08E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.65E+00	0.00E+00	1.62E-01	1.99E+02
$NRPR_M$ (7)*	MJ, LHV	3.14E+00	0.00E+00	2.81E+00	0.00E+00	2.79E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E+00	1.22E+01
SM (8)	kg	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A	0.00E+00
RSF (9)	MJ, LHV	3.43E+00	N/A	1.72E-01	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A	3.60E+00
NRSF (10)	MJ, LHV	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A	0.00E+00
RE (11)	MJ, LHV	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A	0.00E+00
FW (12)	m^3	9.58E+01	0.00E+00	4.79E+00	0.00E+00	6.57E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.66E+02
Output Flows and Waste																
HWD (13)	kg	3.45E-02	N/A	1.72E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.62E-02
NHWD (14)	kg	6.41E-02	N/A	6.44E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.41E+01	1.43E+01
HLRW (15)	m^3	1.92E-09	1.13E-13	2.08E-10	0.00E+00	3.27E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.47E-14	0.00E+00	2.40E-11	5.42E-09
ILLRW (16)	m^3	2.42E-09	5.38E-13	5.63E-10	0.00E+00	5.67E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E-13	0.00E+00	8.40E-10	9.49E-09
CRU (17)	kg	N/A	N/A	N/A	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	0.00E+00	N/A	0.00E+00	N/A	0.00E+00
MR (17)	kg	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	0.00E+00	N/A	0.00E+00	N/A	0.00E+00
MER (17)	kg	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	0.00E+00	N/A	0.00E+00
EE (17)	MJ, LHV	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	0.00E+00	0.00E+00	0.00E+00

*In the calculation of RPRM and NRPRM, packaging materials were included.

Table 15: 7/16 Engineered Construction Flooring Life Cycle Inventory Results

Resource use																
Parameter	Unit	Production stage	Construction stage		Use stage							End-of-life stage				Total
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	
RPR_E[4]	MJ, LHV	2.49E+02	2.30E-02	1.51E+01	0.00E+00	5.47E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.03E-03	0.00E+00	2.69E+02	5.38E+02
RPR_M[5]*	MJ, LHV	1.29E+02	0.00E+00	6.27E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.31E+02	2.66E+02
$NRPR_E$[6]	MJ, LHV	1.09E+02	8.68E+00	1.57E+01	0.00E+00	6.08E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E+00	0.00E+00	1.49E+00	1.97E+02
$NRPR_M$[7]*	MJ, LHV	5.31E+00	0.00E+00	2.92E+00	0.00E+00	2.79E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.30E+00	1.43E+01
SM[8]	kg	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A	0.00E+00
RSF[9]	MJ, LHV	2.66E+00	N/A	1.33E-01	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A	2.79E+00
NRSF[10]	MJ, LHV	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A	0.00E+00
RE[11]	MJ, LHV	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A	0.00E+00
FW[12]	m^3	4.72E+01	0.00E+00	2.36E+00	0.00E+00	6.57E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E+02
Output Flows and Waste																
HWD[13]	kg	1.70E-02	N/A	8.49E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.78E-02
NHWD[14]	kg	3.16E-02	N/A	3.17E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.97E+00	7.03E+00
HLRW[15]	m^3	2.40E-09	5.86E-14	2.45E-10	0.00E+00	3.27E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-14	0.00E+00	1.19E-11	5.93E-09
ILLRW[16]	m^3	6.82E-09	2.79E-13	5.77E-10	0.00E+00	5.67E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.77E-14	0.00E+00	4.15E-10	1.35E-08
CRU[17]	kg	N/A	N/A	N/A	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	0.00E+00	N/A	0.00E+00	N/A	0.00E+00
MR[17]	kg	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	0.00E+00	N/A	0.00E+00	N/A	0.00E+00
MER[17]	kg	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	0.00E+00	N/A	0.00E+00
EE[17]	MJ, LHV	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	0.00E+00	0.00E+00	0.00E+00

*In the calculation of RPRM and NRPRM, packaging materials were included.

Table 16: Solid 2-Ply Engineered Construction Flooring Life Cycle Inventory Results

Resource use																
Parameter	Unit	Production stage	Construction stage		Use stage							End-of-life stage				Total
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	
RPR_E (4)	MJ, LHV	2.69E+02	1.86E-02	1.89E+01	0.00E+00	5.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.02E-03	0.00E+00	1.97E+02	4.90E+02
RPR_M (5)*	MJ, LHV	2.04E+02	0.00E+00	9.91E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.97E+02	4.10E+02
$NRPR_E$ (6)	MJ, LHV	9.47E+01	1.35E+01	9.55E+01	0.00E+00	5.17E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.91E+00	0.00E+00	2.41E+00	2.61E+02
$NRPR_M$ (7)*	MJ, LHV	5.48E+00	0.00E+00	2.68E+01	0.00E+00	2.79E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.34E+00	4.04E+01
SM (8)	kg	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A	0.00E+00
RSF (9)	MJ, LHV	4.33E+00	N/A	2.17E-01	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A	4.55E+00
NRSF (10)	MJ, LHV	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A	0.00E+00
RE (11)	MJ, LHV	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A	0.00E+00
FW (12)	m^3	7.64E+01	0.00E+00	3.82E+00	0.00E+00	6.57E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.46E+02
Output Flows and Waste																
HWD (13)	kg	2.75E-02	N/A	1.37E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.89E-02	
NHWD (14)	kg	5.11E-02	N/A	5.13E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.13E+01	1.14E+01
HLRW (15)	m^3	3.75E-10	9.10E-14	4.71E-10	0.00E+00	3.00E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.97E-14	0.00E+00	1.92E-11	3.86E-09
ILLRW (16)	m^3	1.71E-09	4.34E-13	1.12E-09	0.00E+00	2.27E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.38E-14	0.00E+00	6.73E-10	5.77E-09
CRU (17)	kg	N/A	N/A	N/A	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	0.00E+00	N/A	0.00E+00	N/A	0.00E+00
MR (17)	kg	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	0.00E+00	N/A	0.00E+00	N/A	0.00E+00
MER (17)	kg	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	0.00E+00	N/A	0.00E+00
EE (17)	MJ, LHV	0.00E+00	N/A	0.00E+00	N/A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	0.00E+00	0.00E+00	0.00E+00

*In the calculation of RPRM and NRPRM, packaging materials were included.

(4): RPRE = RPRT - RPRM, where RPRT is equal to the value for renewable energy obtained using the CED LHV.

(5): RPRM is calculated by multiplying the mass (kg) of the material input (or its components) with the net calorific value (lower heating value) (MJ/kg) of this input as per ACLCA ISO 21930 Guidance [9]. In the calculation of RPRM, packaging materials were included.

(6): NRPRE = NRPRT - NRPRM, 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).

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

(8): Calculated as per ACLCA ISO 21930 Guidance [9], 6.5 Secondary material, SM: There is no SM involved in Lauzon Hardwood Flooring.

(9): Calculated as per ACLCA ISO 21930 Guidance [9], 6.6 Renewable secondary fuels, RSF: There is RSF involved in the Lauzon Hardwood Flooring manufacturing process.

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

(11): Calculated as per ACLCA ISO 21930 Guidance [9], 6.8.1 Recovery Energy, RE: There is no RE involved in the Lauzon Hardwood Flooring manufacturing process

(12): Represents the use of net fresh water in the factory that is part of the life cycle inventory.

(13): Calculated from life cycle inventory results, based on datasets marked as “hazardous.”

(14): Calculated from life cycle inventory results, based on “non hazardous” waste.

(15): Calculated as per ACLCA ISO 21930 Guidance [9], 10.3 High-level radioactive waste, conditioned, to final repository. It should be noted that the Lauzon Hardwood Flooring manufacturing process does not generate any high-level radioactive waste (HLRW), e.g., when generated by electricity production, consisting mostly of spent fuel from reactors (ISO 21930:2017, clause 7.2.14).

(16): Calculated as per ACLCA ISO 21930 Guidance [9], 10.4 Intermediate- and low-level radioactive waste, conditioned, to final repository. It should be noted that the Lauzon Hardwood Flooring manufacturing process does not generate any low- and intermediate-level radioactive wastes (ILLRW)., e.g., when generated by electricity production, arising mainly from routine facility maintenance and operations (ISO 21930:2017, clause 7.2.14).

(17): There are no reused components (CRU), materials for recycling (MR), materials for energy recovery (MER) or exported energy (EE) in this analysis.

Table 17: Biogenic carbon accounting result for a FU

Parameter	Unit	Hardwood Flooring		
		Solid Construction	7/16 Engineered Construction	Solid 2-Ply Engineered Construction
BCRP	kg CO2 eq	-4.23E+01	-2.18E+01	-3.60E+01
BCEP	kg CO2 eq	1.70E+01	8.34E+00	1.34E+01
BCRK	kg CO2 eq	-7.73E-01	-6.37E-01	-1.03E+00
BCEK	kg CO2 eq	6.56E-02	3.25E-02	5.23E-02

BCRP - Biogenic carbon removal from product; BCEP - Biogenic carbon emission from product; BCRK - Biogenic carbon removal from packaging; BCEK - Biogenic carbon emission from packaging.

6. LCA: INTERPRETATION

6.1. CONTRIBUTION ANALYSIS

The production life cycle stages (A1, A2 and A3 modules) is the major contributor for all three Lauzon Hardwood Flooring products. In the case of Solid Construction Flooring, the production stage presents major impacts for all life cycle impacts except for the eutrophication impact categories (13% of the total impacts). In the production stage, the manufacturing module (A3) is the highest contributor due to the combustion of biomass for heat production. Regarding the production life cycle stage of 7/16 Engineered Construction Flooring, the highest contribution comes from the extraction and upstream production module (A1) due to plywood material production. As with Solid Construction Flooring, the combustion of biomass for heat production is a major contributor for the manufacturing module (A3) of Solid 2-Ply Engineered Construction Flooring.

Module B2 represents the maintenance operations of the functional unit for a period of 75 years (building ESL). Its highest impact is due to the materials used (detergent and UV finish) for 75 years of the building's life. The impacts of maintenance activities for the ESL building represents between 9% and 34% of the total impacts for all hardwood flooring due to cleaning product production.

Gas emissions from landfill waste (C4 modules) contributes between 42% and 57% of the total impacts of eutrophication and global warming indicators due to waste decomposition.

When including biogenic carbon in the calculation, the environmental impacts of Lauzon's products for the Global Warming Potential impact category decreases. The impact of the production stage for Solid Construction Flooring represents -1.85E+01 kg CO2 eq. For 7/16 Engineered Construction Flooring and Solid 2-Ply Engineered Construction Flooring, the production stage impacts were -7.16E+00 kg CO2 eq. and -1.65E+01 kg CO2 eq., respectively, for the Global Warming Potential impact category.

7. ADDITIONAL ENVIRONMENTAL INFORMATION

7.1. ENVIRONMENTAL ACTIVITIES AND CERTIFICATION

When you choose a Lauzon flooring product, you can take comfort in knowing that our policies are designed to protect the forest for generations to come. As Lauzon wood material coming from sustainable manage forest, the accounting of biogenic carbon was performed and characterized as indicated above. Lauzon has certified Forest Stewardship Council (FSC): https://plancherslauzon.com/certifications/planchers-certifies-fsc/. We are accountable for all the resources we use, and our ISO 14001 Certification is a testament to our desire to work tirelessly to do things right, from forest to floor.

7.2. ENVIRONMENT AND HEALTH DURING INSTALLATION

The manufacturer's installation instructions should be followed [4]. During installation, personal protective equipment (dust masks or respirators, ear plugs, and safety glasses) should be worn to protect the installer's respiratory system, ears, and eyes from excessive exposure to sawdust. In addition, the use of knee pads and rubber gloves is recommended.

7.3. EXTRAORDINARY EFFECTS

Lauzon Hardwood Flooring is committed to making products that contribute to a healthy living environment. In addition to the higher quality and performance of their finish, Lauzon's flooring products hold Health Product Declaration (HPDs).

8. REFERENCES

[1] ISO 14025, "Environmental labels and declarations - Type III environmental declarations - Principles and procedures," 2006.

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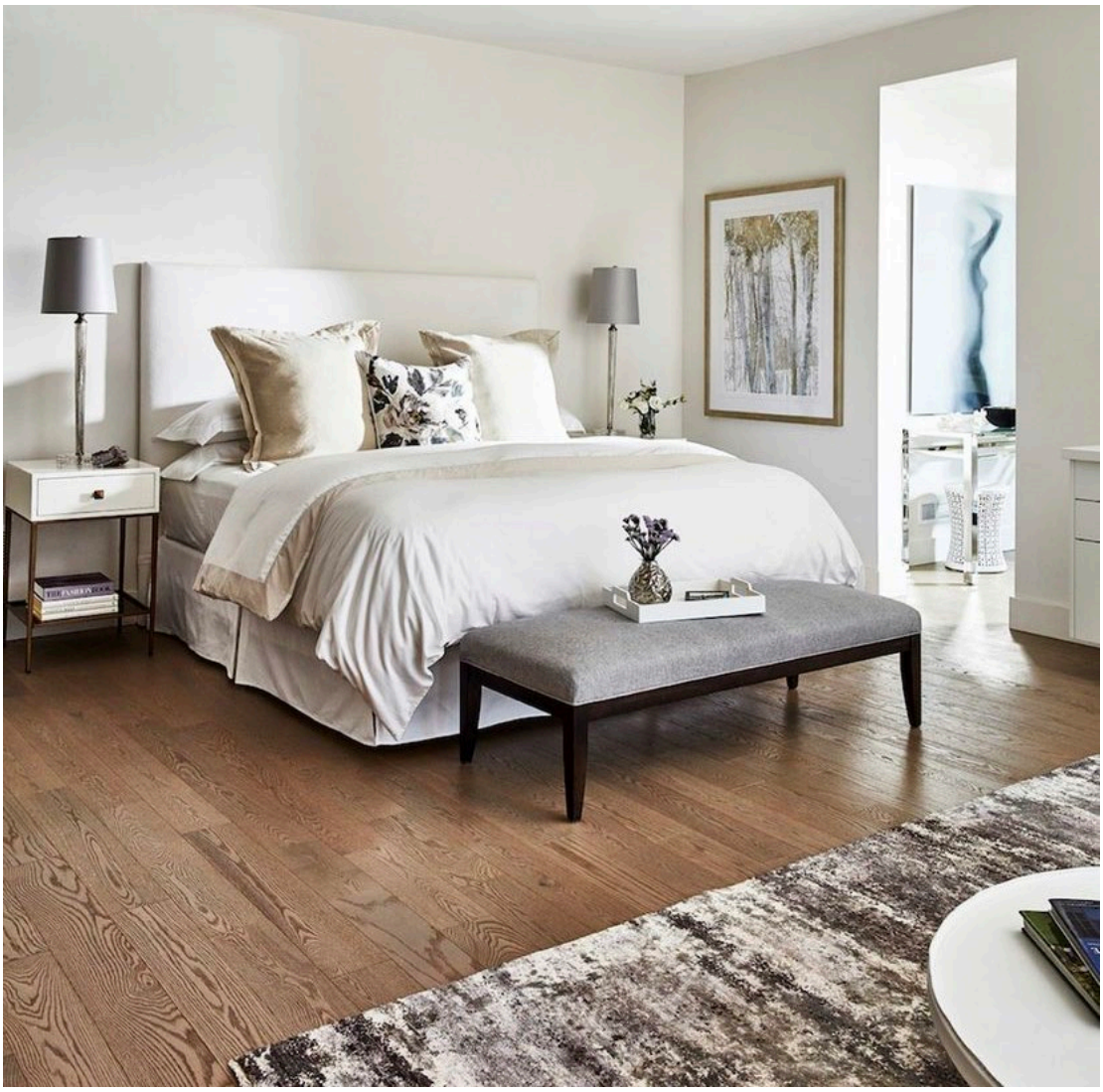

EPD

This LCA and EPD were prepared by Vertima Inc.

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

vertima
Environmental certification experts
vertima.ca

LAUZON HARDWOOD FLOORING

2101 côte des Cascades

Papineauville (Quebec)

J0V 1R0 Canada

https://plancherslauzon.com/

EPD

This LCA and EPD were prepared by Vertima Inc.

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

vertima

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vertima.ca