

LP[®] SMARTSIDE[®] ENVIRONMENTAL PRODUCT DECLARATION

EPD FOR LP[®] SMARTSIDE[®] TRIM & SIDING PRODUCED BY
LOUISIANA-PACIFIC CORPORATION, NASHVILLE, TENNESSEE, USA

[LPCorp.com/SmartSide](https://www.LPCorp.com/SmartSide)

LP SmartSide[®]
TRIM & SIDING

ASTM CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION

PROGRAM OPERATOR	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA 19428-2959 USA www.astm.org
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	ASTM Program Operator for Product category Rules (PCR) and Environmental Product Declarations (EPDs) – General Program Instructions, version: 8.0
DECLARATION OWNER	Louisiana-Pacific Corporation 414 Union St #2000, Nashville, TN 37219 USA LPCorp.com
DECLARATION NUMBER	EPD192
DECLARED PRODUCT	
DECLARED UNIT	1 m ³ of SmartSide produced at LP SmartSide facilities in North America
REFERENCE PCR AND VERSION NUMBER	ISO 21930:2017 Sustainability in Building Construction – Environmental Declaration of Building Products. [6] UL Environment: Product Category Rules for Building-Related Products and Services Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report, v3.2 [13] Part B: Structural and Architectural Wood Products EPD Requirements, v1.0 [14]
DESCRIPTION OF PRODUCT'S INTENDED APPLICATION AND USE	SmartSide is an engineered wood product. It is a durable waterproof exterior product used for siding and trim.
MARKETS OF APPLICABILITY	Construction Sector, Exterior siding and trim
DATE OF ISSUE	March 9, 2021
PERIOD OF VALIDITY	March 9, 2026
EPD TYPE	Product-specific EPD
EPD SCOPE	Cradle to Gate
YEAR OF REPORTED MANUFACTURER PRIMARY DATA	2019

LCA SOFTWARE SimaPro v9.0.0.49

LCI DATABASES USLCI [9], Ecoinvent 3.5 [15], Datasmart [8]

LCIA METHODOLOGY TRACI 2.1 [2]

THE SUB-CATEGORY PCR REVIEW WAS CONDUCTED BY: Dr. Thomas Gloria (chair) Industrial Ecology Consultants
Dr. Indro Gangly University of Washington
Dr. Sahoo University of Georgia

LCA AND EPD DEVELOPER

This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:

The Consortium for Research on Renewable Industrial Materials (CORRIM)
PO Box 2432
Corvallis, OR 97330
541-231-2627
www.corrim.org

Mansen Puettm

This declaration was independently verified in accordance with ISO 14025:2006.

The UL Environment “Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report,” v3.2 (December 2018), in conformance with ISO 21930:2017, serves as the core PCR, with additional considerations from the USGBC/UL Environment Part A Enhancement (2017).

Internal External

INDEPENDENT VERIFIER

This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:

Thomas P. Gloria
Industrial Ecology Consultants
35 Bracebridge Rd.
Newton, MA 02459-1728
Email: t.gloria@industrial-ecology.com

Thomas Gloria

LIMITATIONS

- Environmental declarations from different programs (ISO 14025) may not be comparable.
- Comparison of the environmental performance using EPD information shall consider all relevant information modules over the full life cycle of the products within the building.
- This PCR allows EPD comparability only when the same functional requirements between products are ensured and the requirements of ISO 21930:2017 §5.5 are met. It should be noted that different LCA software and background LCI datasets may lead to different results for upstream or downstream of the life cycle stages declared.



COMPANY AND PRODUCT DESCRIPTION

This EPD represents the cradle-to-gate energy and materials required for producing SmartSide® Lap, Panel, and Trim (“Products”) produced in North America. Louisiana-Pacific (LP) Corporation SmartSide® products are manufactured in Minnesota, Michigan, and Wisconsin of the U.S, and British Columbia and Manitoba, Canada. Primary application categories of SmartSide® products include lap and panel exterior siding and trim for residential buildings. These products go into a variety of applications based on their properties and desired end use. The 2019 production data used in this EPD considers all SmartSide® products produced during the year and is weighted based on material output. The production data used in this EPD is presented in cubic meters and one square meter representing the dimensions in Tables 1-3 (7).

TABLE 1 Size specification for LP® SmartSide® Panel siding

LENGTH-Feet (METERS)	PANEL WIDTH-INCHES (CENTIMETERS)	THICKNESS-INCHES (MILLIMETERS)	WEIGHT-POUNDS PER SQUARE FOOT (KG PER SQUARE METER)
6 ft (1.8 m)	48.56 in (123.4 cm)	0.315 in ¹ (8 mm)	1.5 lb/ft ² (7.32 kg/m ²)
7 ft (2.1 m)	48.56 in (123.4 cm)	0.315 in ¹ (8 mm)	1.5 lb/ft ² (7.32 kg/m ²)
8 ft (2.4 m)	48.56 in (123.4 cm)	0.315 in (8 mm) ^{1,2,3} 0.375 in (9.5 mm) ^{4,5} 0.530 in (13.5 mm) ^{6,7}	1.5 lb/ft ² (7.32 kg/m ²) 1.5 lb/ft ² (7.32 kg/m ²) 2.0 lb/ft ² (9.76 kg/m ²)
9 ft (2.7 m)	48.56 in (123.4 cm)	0.315 in (8 mm) ^{1,2} 0.375 in (9.5 mm) ^{4,5} 0.530 in (13.5 mm) ^{6,7}	1.5 lb/ft ² (7.32 kg/m ²) 1.5 lb/ft ² (7.32 kg/m ²) 2.0 lb/ft ² (9.76 kg/m ²)
10 ft (3.0 m)	48.56 in (123.4 cm)	0.315 in (8 mm) ^{1,2} 0.375 in (9.5 mm) ^{4,5} 0.530 in (13.5 mm) ^{6,7}	1.5 lb/ft ² (7.32 kg/m ²) 1.5 lb/ft ² (7.32 kg/m ²) 2.0 lb/ft ² (9.76 kg/m ²)
12 ft (3.7 m)	48.56 in (123.4 cm)	0.315 in (8 mm) ¹	1.5 lb/ft ² (7.32 kg/m ²)

1. 38 Series Cedar Texture Panel
2. 38 Series Cedar Texture Panel, No Groove, Shiplap Edge
3. 38 Series Cedar Texture Panel, No Groove, Square Edge
4. 76 Series Cedar Texture Panel
5. 76 Series Cedar Texture Panel, No Groove, Shiplap Edge
6. 190 Series Cedar Texture
7. 190 Series Cedar Texture Panel, No Groove, Shiplap Edge



TABLE 2 Size specification for LP® SmartSide® Lap siding

LENGTH-FEET (METERS)	PANEL WIDTH-INCHES (CENTIMETERS)	THICKNESS-INCHES (MILLIMETERS)	WEIGHT-POUNDS PER SQUARE FOOT (KG PER SQUARE METER)
12 ft (3.7 m)	7.84 in ¹ (19.9 cm)	0.315 in ¹ (8 mm)	1.5 lb/ft ² (7.32 kg/m ²)
16 ft (4.9 m)	5.84 in (14.8 cm) ^{1,2,4} 6.84 in (17.4 cm) ¹ 7.84 in (19.9 cm) ^{1,2,3,4} 11.84 in (30.1 cm) ^{1,2,4}	0.315 in ¹ (8 mm)	1.5 lb/ft ² (7.32 kg/m ²)

- 1. 38 Series Cedar Texture Lap
- 2. 76 Series Cedar Texture Lap
- 3. 76 Series SmartLock™ Cedar Texture Lap
- 4. 38 Series Smooth Finish Lap



TABLE 3 Size specification for LP® SmartSide® trim

DESCRIPTION	LENGTH-FEET (METERS)	PANEL WIDTH-INCHES (CENTIMETERS)	THICKNESS-INCHES (MILLIMETERS)	WEIGHT-POUNDS PER SQUARE FOOT (KG PER SQUARE METER)
190 Series Cedar Texture Trim	16 ft (4.9 m)	2.50 in (6.4 cm) 3.50 in (8.9 cm) 5.50 in (14.0 cm)	0.530 in (13.5 mm)	2.0 lb/ft ² (9.76 kg/m ²)
440 series cedar Texture Trim	16 ft (4.9 m)	1.50 in (3.8 cm) 2.50 in (6.4 cm) 3.50 in (8.9 cm) 5.50 in (14.0 cm) 7.21 in (18.3 cm) 9.21 in (23.4 cm) 11.21 in (28.5 cm)	0.625 in (15.9 mm)	2.0 lb/ft ² (9.76 kg/m ²)
540 Series cedar Texture Trim	16 ft (4.9 m)	1.50 in (3.8 cm) 2.50 in (6.4 cm) 3.50 in (8.9 cm) 5.50 in (14.0 cm) 7.21 in (18.3 cm) 9.21 in (23.4 cm) 11.21 in (28.5 cm)	0.910 in (23.1 mm)	3.0 lb/ft ² (14.65 kg/m ²)
440 Series Cedar Texture Ploughed Fascia	16 ft (4.9 m)	48.56 in (123.4 cm)	0.625 in (15.9 mm)	2.0 lb/ft ² (9.76 kg/m ²)

The primary species used in SmartSide® products is Aspen (Populus spp.) representing 93% and 6% from Basswood (Tilia spp.); other species include soft maple, pine, balsam poplar, and white birch. Aspen is abundant in northern Midwest of the United States and throughout Canada where SmartSide® are produced.

SmartSide® products are categorized under United Nations Standard Products and Services Code (UNSPSC) and Construction Specification Institute (CSI) for sheathing, sheets, siding, and exterior materials (Table 4).



TABLE 4 United Nations standard products and services code (UNSPSC) and construction specification institute (CSI) Masterformat code for LP® SmartSide® Trim & Siding.

CLASSIFICATION STANDARD	CATEGORY	PRODUCT CODE
UNSPSC	Wood Sheathing and Sheets	30103604
	Siding	30151802
	Siding and Exterior Wall Materials	30151800
CSI/CSC	Sheathing	06 16 00
	Wood, Plastic, and Composites	06 00 00
	Thermal and Moisture Protection	07 00 00
	Wood Siding	07 46 23
ICC-ES	Treated Engineered Wood Siding	AC-321

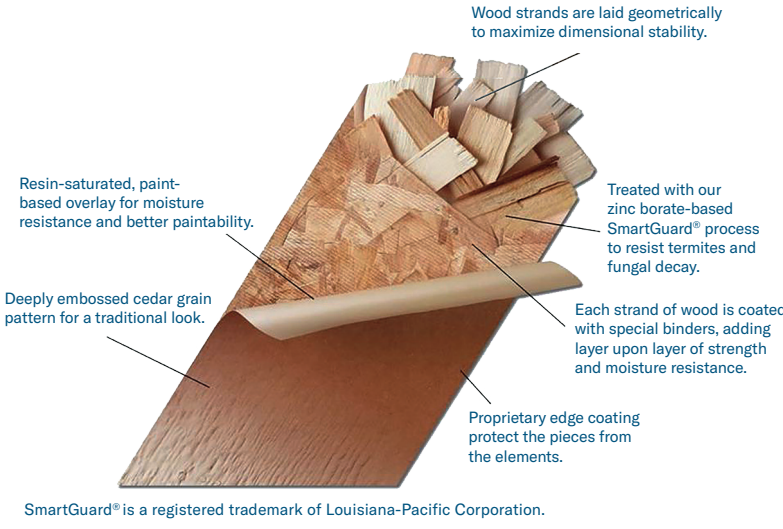


LP® SMARTSIDE® TRIM & SIDING PRODUCTION

The production process begins with whole logs that are debarked (Figure 1). The debarked logs are cut into strands and then dried and screened. The strands are then blended with resin, wax, and zinc borate and formed into mats where a phenolic resin-saturated overlay is applied. The formed panels are pressed using heat produced from self-generated wood waste, then cut and trimmed, (for panel siding, lap siding or trim), and packaged for shipment. Panels are embossed with either a smooth or cedar textured finish.

Panels are protected during shipping with a polypropylene wrapping material made from 100% recycled materials. Other packaging materials include plastic strapping, cardboard shrouds and corner protectors, and wood stickers.

SmartSide® products from LP production facilities contain wood fiber that is legally and sustainably sourced. LP is third party certified to the Sustainable Forestry Initiative® (SFI®) Forest Management, Fiber Sourcing and Chain of Custody Standards and the Programme for the Endorsement of Forest Certification™ (PEFC™) Chain of Custody Standard.





How is it Made?

LP SmartSide Trim & Siding - Treated Engineered Wood Strand Technology

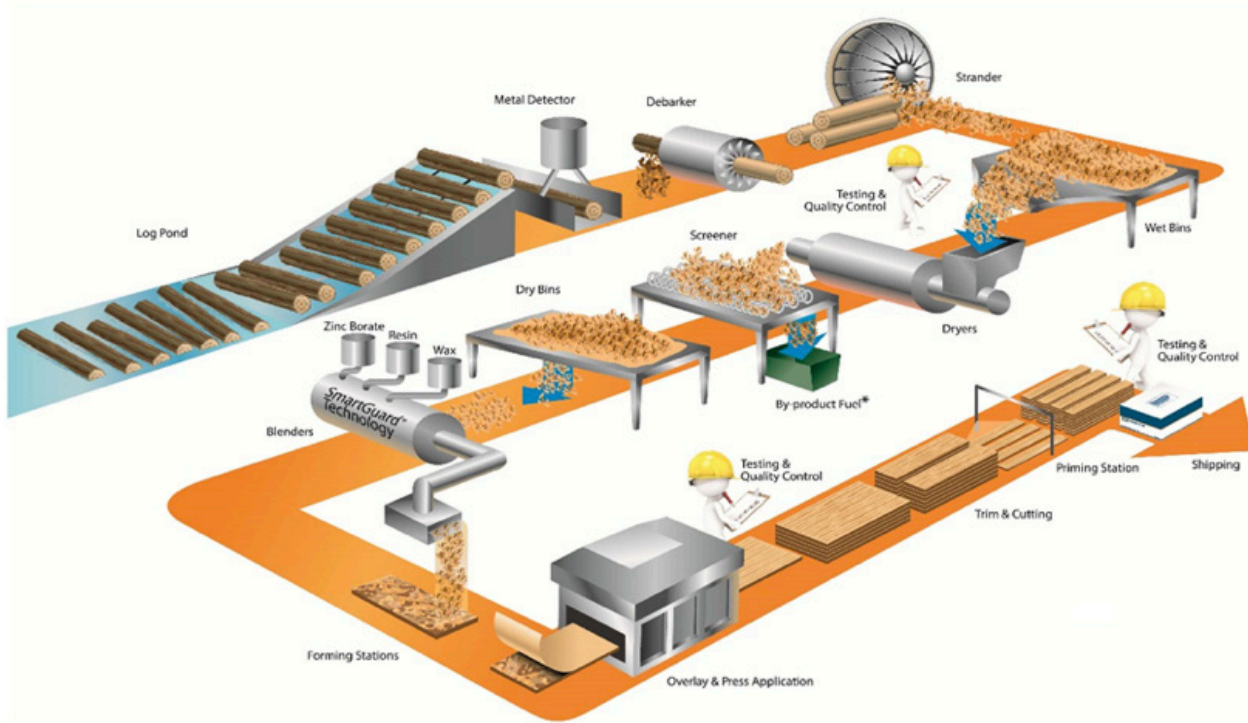


FIGURE 1 Process flow for the production of SmartSide® products

The technical requirements for SmartSide® products represented in this LCA are defined by the following product standards, testing, and certifications.

- ICC-ES ESR-1301 (2020) [Joint Evaluation Report 2020](#)
- ANSI/AWC SDPWS-2015 Special Design Provision for Wind and Seismic
- ASCE 7-16; ASCE 7-10; ASCE 7-05 Minimum Design Loads for Buildings and Other Structures
- APA PRP-108 Performance Standards and Qualification Policy for Structural-Use Panels
- APA PR-N124

Other Technical Standards and Certifications

- NRC-CNRC – CCMC 11826-L 2019

METHODOLOGICAL FRAMEWORK

TYPE OF EPD AND LIFE CYCLE STAGES

This EPD is intended to represent product specific life cycle assessment (LCA) for SmartSide® products (Panel, Lap, and Trim). The underlying LCA [16] investigates the SmartSide® product system from cradle to gate. This comprises the production stage including the information modules ‘A1 Extraction and upstream production,’ ‘A2 Raw Material Transport to factory,’ ‘A3 Manufacturing,’ and A4 Product Transportation to Customer (Figure 2).

CEDAR TEXTURE LAP



CEDAR TEXTURE PANEL

SMOOTH FINISH TRIM

BUILDING LIFE CYCLE INFORMATION MODULES

PRODUCTION STAGE			CONSTRUCTION STAGE		USE STAGE								END-OF-LIFE STAGE			
Extraction and Upstream Production	Raw Material Transport to Factory	Manufacturing	Product Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction/ Demolition	Transport to Waste Processing or Disposal	Waste Processing	Disposal	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	
X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	

FIGURE 2 Life Cycle Stages & Information Modules per ISO 21930. (MND: module not declared)

SYSTEM BOUNDARIES AND PRODUCT FLOW DIAGRAM

The product system described in Figure 3 includes the following information modules and unit processes:

A1 RAW MATERIAL EXTRACTION

A1 includes the cradle-to-gate production of resins that are used in manufacturing SmartSide® products. The upstream resource extraction includes removal of raw materials and processing. A1 also includes the cradle to gate forestry operation that may include nursery operations (which include fertilizer, irrigation, energy for greenhouses if applicable etc.), site preparation, as well as planting, fertilization, thinning and other management operations.

A2 RAW MATERIAL TRANSPORT

Average or specific transportation of raw materials (including secondary materials and fuels) from extraction site or source to manufacturing site (including any recovered materials from source to be recycled in the process).

A3 MANUFACTURING

Manufacturing of SmartSide® products, including packaging.

A4 PRODUCT TRANSPORTATION

Average or specific transportation of product from manufacturing facility to construction site.

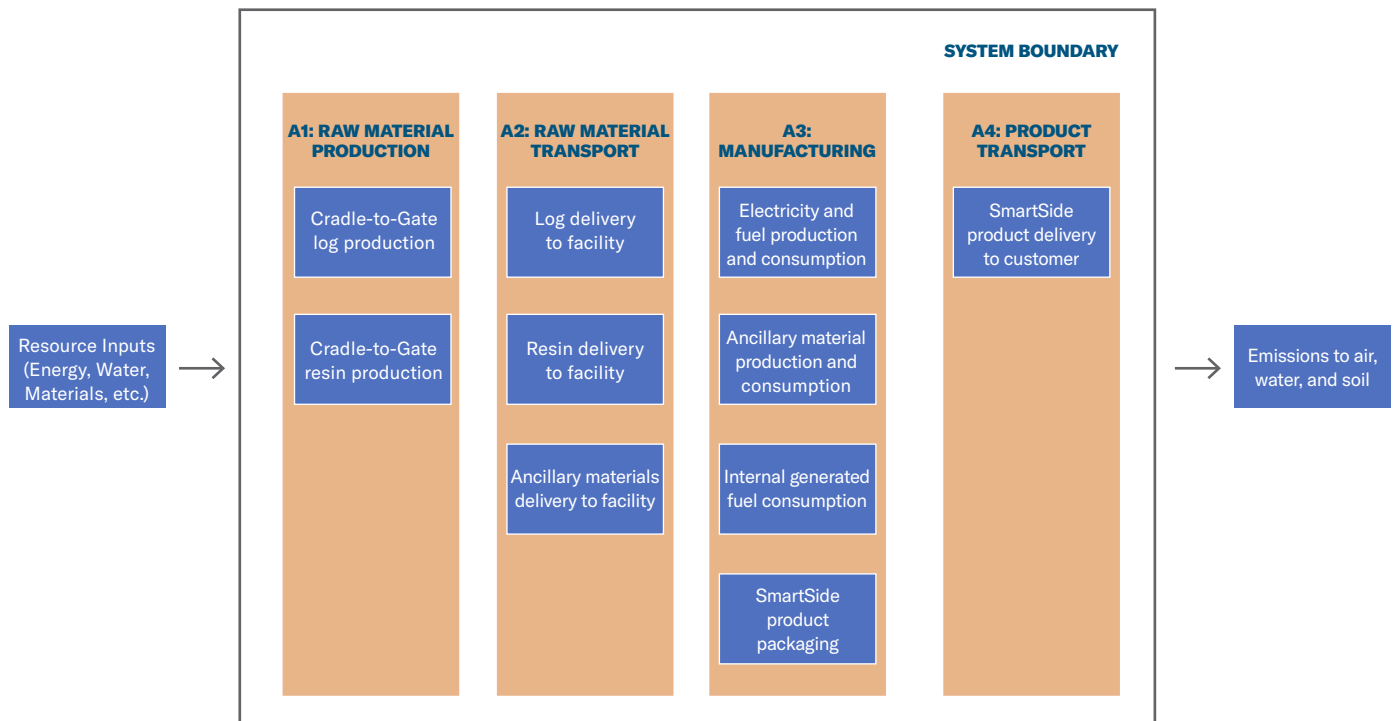


FIGURE 3 Cradle-to-Gate SmartSide® Product System



DECLARED UNIT

Table 5 shows the declared unit and additional product information.

TABLE 5 Declared Unit and Product Information

DECLARED UNIT

The declared unit is “the production of one cubic meter (1 m³) of LP® SmartSide® products.”

PROPERTY	UNIT	VALUE
Mass	kg	657
Thickness	mm	9.5
Density	kg/m ³	657
Moisture Content, Over-Dry basis	%	2%

PRODUCT COMPOSITION

Wood	%	80-95
MDI Resin	%	<10
Wax	%	<2
Zn Borate	%	<3
Overlay	%	<5

ALLOCATION METHODS

Allocation is the method used to partition the environmental load of a process when several products or functions share the same process. SmartSide® facilities in North America produce panel and lap siding as well as oriented strand board and a variety of coproducts (bark, sawdust, hogged fuel) that are sold for other uses. Processing logs to produce SmartSide® involves multiple processes with multiple coproduct outputs. SmartSide production processes were allocated on a mass basis in accordance with UL PCR 2019 and ISO 21930:2017.

CUT-OFF CRITERIA

The cut-off criteria for all activity stage flows considered within the system boundary conform with ISO 21930: 2017 Section 7.1.8. Specifically, the cut-off criteria were applied as follows:

- All inputs and outputs for which data are available are included in the calculated effects and no collected core process data are excluded.
- A one percent cut-off is considered for renewable and non-renewable primary energy consumption and the total mass of inputs within a unit process. The sum of the total neglected flows does not exceed 5% of all energy consumption and mass of inputs.
- All flows known to contribute a significant impact or to uncertainty are included.
- The cut-off rules are not applied to hazardous and toxic material flows—all of which are included in the life cycle inventory.

No material or energy input or output was knowingly excluded from the system boundary.

DATA SOURCES

Primary and secondary data sources, as well as the respective data quality assessment are documented in the underlying LCA project report in accordance with UL PCR 2019.

This EPD estimates the impacts of forest management from the industry average North Central Hardwood and Canadian resources LCA. [10, 11].

Third party verified ISO 14040/44 [3, 4, 5] secondary LCI data sets contribute more than 67% of total impact to any of the required impact categories identified by the applicable PCR [13, 14].

TREATMENT OF BIOGENIC CARBON AND SUSTAINABLE FOREST MANAGEMENT CERTIFICATION

Biogenic carbon emissions and removals are reported in accordance with ISO 21930 7.2.7. and 7.2.12. Detailed information is provided in the underlying LCA in Section 7.2.

ISO 21930 requires a demonstration of forest sustainability to characterize carbon removals with a factor of -1 kg CO₂e/kg CO₂. ISO 21930 Section 7.2.11 Note 2 states the following regarding demonstrating forest sustainability: “Other evidences such as national reporting under the United Nations Framework Convention on Climate Change (UNFCCC) can be used to identify forests with stable or increasing forest carbon stocks.” The United States UNFCCC annual report Table 6-1 provides annual NET GHG Flux Estimates for different land use categories. This reporting indicates non-decreasing forest carbon stocks and thus the source forests meet the conditions for characterization of removals with a factor of -1 kg CO₂e/kg CO₂. Tables 8 and 9 provide additional inventory parameters related to biogenic carbon removal and emissions.

ENVIRONMENTAL PARAMETERS DERIVED FROM LCA

Tables 6 and 7 present the LCIA and LCI parameter results for the declared unit of 1 m³ and 1 m² of SmartSide® products. The impact categories and characterization factors (CF) for the LCIA were derived from the U.S. EPA Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts -TRACI 2.1 [2].

The total primary energy consumption is tabulated from the LCI results based on the Cumulative Energy Demand Method published by Ecoinvent [15]. Lower heating value of primary energy carriers is used to calculate the primary energy values reported in the study.

Other inventory parameters concerning material use, waste, water use, and biogenic carbon were drawn from the LCI results. We followed the ACLCA's Guidance to Calculating non-LCIA Inventory Metrics in accordance with ISO 21930:2017 [1].

SimaPro 9.0.0.49 [12] was used to organize and accumulate the LCI data, and to calculate the LCIA results.



TABLE 6 LCIA Results Summary for Cradle-to-Gate production of 1 m³ of LP[®] SmartSide[®] products.

CORE MANDATORY IMPACT INDICATOR			A1: EXTRACTION	A2: RAW MATERIAL TRANSPORT	A3: MANUFACTURING	A4: PRODUCT TRANSPORT	TOTAL
Global warming potential	GWP _{BIO}	kg CO ₂ e	(1,756.19)	27.49	2,076.01	74.24	421.55
Global warming potential	GWP _{TRACI}	kg CO ₂ e	129.86	27.49	189.96	74.24	421.55
Depletion potential of the stratospheric ozone layer	ODP	kg CFC11e	2.57E-07	6.05E-07	7.27E-06	2.64E-06	0.00
Acidification potential of soil and water sources	AP	kg SO ₂ e	0.8409	0.1806	0.9850	0.4915	2.50
Eutrophication potential	EP	kg Ne	0.0732	0.0190	1.1495	0.0566	1.30
Formation potential of tropospheric ozone	SFP	kg O ₃ e	16.90	5.28	14.76	14.27	51.22
Abiotic depletion potential (ADP _{fossil}) for fossil resources	ADP _f	MJ, NCV	2,500.91	346.81	2,267.14	941.01	6,055.87
Fossil fuel depletion	FFD	MJ Surplus	3.69E+02	5.15E+01	2.10E+02	1.39E+02	769.37
USE OF PRIMARY RESOURCES							
Renewable primary energy carrier used as energy	RPRE	MJ, NCV	20.40	1.30	4,191.16	4.42	4,217.28
Renewable primary energy carrier used as material	RPRM	MJ, NCV	17,136.12	-	-	-	17,136.12
Non-renewable primary energy carrier used as energy	NRPRE	MJ, NCV	2,731.82	353.32	2,595.08	961.25	6,641.47
Non-renewable primary energy carrier used as material	NRPRM	MJ, NCV	1,119.55	-	-	-	1,119.55
MANDATORY INVENTORY PARAMETERS							
Consumption of freshwater resources	FW	m ³	1.9805	0.0128	1.2906	0.0563	3.3402
INDICATORS DESCRIBING WASTE							
Hazardous waste disposed	HWD	kg	0.2209	0.0081	0.0730	0.0361	0.3381
Non-hazardous waste disposed	NHWD	kg	6.39	3.87	37.95	12.96	61.17
High-level radioactive waste, conditioned, to final repository	HLRW	m ³	0.00E+00	0.00E+00	2.99E-07	0.00E+00	2.99E-07
Intermediate- and low-level radioactive waste, conditioned, to final repository	ILLRW	m ³	8.52E-08	2.08E-07	4.44E-06	8.91E-07	5.62E-06

TABLE 7 LCIA Results Summary for Cradle-to-Gate production of 1 m² of LP® SmartSide® Products

CORE MANDATORY IMPACT INDICATOR			A1: EXTRACTION	A2: RAW MATERIAL TRANSPORT	A3: MANUFACTURING	A4: PRODUCT TRANSPORT	TOTAL
Global warming potential	GWP _{BIO}	kg CO ₂ e	(16.728)	0.262	19.774	0.707	4.015
Global warming potential, fossil	GWP _{TRACI}	kg CO ₂ e	1.237	0.262	1.809	0.707	4.015
Depletion potential of the stratospheric ozone layer	ODP	kg CFC11e	2.44E-09	5.76E-09	6.93E-08	2.51E-08	1.03E-07
Acidification potential of soil and water sources	AP	kg SO ₂ e	8.01E-03	1.72E-03	9.38E-03	4.68E-03	2.38E-02
Eutrophication potential	EP	kg Ne	6.97E-04	1.81E-04	1.09E-02	5.39E-04	1.24E-02
Formation potential of tropospheric ozone	SFP	kg O ₃ e	1.61E-01	5.03E-02	1.41E-01	1.36E-01	4.88E-01
Abiotic depletion potential (ADP _{fossil}) for fossil resources	ADP _f	MJ, NCV	23.821	3.303	21.595	8.963	57.682
Fossil fuel depletion	FFD	MJ Surplus	3.513	0.491	2.001	1.323	7.328
USE OF PRIMARY RESOURCES							
Renewable primary energy carrier used as energy	RPRE	MJ, NCV	0.194	0.012	39.921	0.042	40.170
Renewable primary energy carrier used as material	RPRM	MJ, NCV	163.222	-	-	-	163.222
Non-renewable primary energy carrier used as energy	NRPRE	MJ, NCV	26.021	3.365	24.718	9.156	63.260
Non-renewable primary energy carrier used as material	NRPRM	MJ, NCV	10.664	-	-	-	10.664
SECONDARY MATERIAL, SECONDARY FUEL, AND RECOVERED ENERGY							
Consumption of freshwater resources	FW	m ³	1.89E-02	1.22E-04	1.23E-02	5.36E-04	3.18E-02
INDICATORS DESCRIBING WASTE							
Hazardous waste disposed	HWD	kg	2.10E-03	7.73E-05	6.96E-04	3.44E-04	3.22E-03
Non-hazardous waste disposed	NHWD	kg	6.09E-02	3.68E-02	3.61E-01	1.23E-01	5.83E-01
High-level radioactive waste, conditioned, to final repository	HLRW	m ³	0.00E+00	0.00E+00	2.85E-09	0.00E+00	2.85E-09
Intermediate- and low-level radioactive waste, conditioned, to final repository	ILLRW	m ³	8.12E-10	1.99E-09	4.23E-08	8.48E-09	5.36E-08

To ensure transparency Tables 8 and 9 show additional inventory parameters related to biogenic carbon removal and emissions. The carbon dioxide flows are presented unallocated to consider co-products leaving the product system in information module A3-Manufacturing. Even though, the system boundary of this study included only the information modules A1-A3, in accordance with ISO 21930, BCEK (Packaging) was reported in A5-Construction and BCEP (Main Product) of the main product in C3/C4-End-of-Life.

Total GWP_{BIO} includes biogenic carbon emissions and removals from the information modules A1-A3, A5, and C3/C4, leading to a net zero contribution of biogenic carbon to GWP_{BIO} .

The net carbon emission (GWP_{BIO}) across the entire life cycle is zero. It is assumed that all carbon removed from the atmosphere is eventually emitted to the atmosphere as CO_2 . Total GWP_{BIO} includes biogenic carbon emissions and removals from the information modules A1-A3, A5 and C3/C4, leading to a net zero contribution of biogenic carbon to GWP_{BIO} . Therefore, in Table 6 and 7 results from total GWP_{TRACI} and total GWP_{BIO} are equal.

TABLE 8 Biogenic carbon inventory parameters for 1 m³ of LP[®] SmartSide[®] products

ADDITIONAL INVENTORY PARAMETERS		A1: EXTRACTION	A2: RAW MATERIAL TRANSPORT	A3: MANUFACTURING	A5: CONSTRUCTION	C3/C4: END-OF-LIFE	TOTAL
		kg CO ₂ e					
Biogenic Carbon Removal from Product	BRCP	(1,886.05)	-	0.00	0.00	0.00	(1,886.05)
Biogenic Carbon Emission from Product	BCEP	0.00	-	360.47	0.00	1,147.01	1,572.79
Biogenic Carbon Removal from Packaging	BCRK	-	-	(16.21)	0.00	-	(16.21)
Biogenic Carbon Emission from Packaging	BCEK	-	-	0.00	16.21	-	16.21
Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production	BCEW	-	-	378.58	0.00	-	378.58
Net Biogenic Carbon Emissions							0.00

TABLE 9 Biogenic carbon inventory parameters for 1 m² of LP® SmartSide® products

ADDITIONAL INVENTORY PARAMETERS		A1: EXTRACTION	A2: RAW MATERIAL TRANSPORT	A3: MANUFACTURING	A5: CONSTRUCTION	C3/C4: END-OF-LIFE	TOTAL
Biogenic Carbon Removal from Product	BRCP	(17.965)	-	0.00	0.00	0.00	(17.965)
Biogenic Carbon Emission from Product	BCEP	0.00	-	3.433	0.00	10.925	14.359
Biogenic Carbon Removal from Packaging	BCRK	-	-	(0.154)	0.00	-	(0.154)
Biogenic Carbon Emission from Packaging	BCEK	-	-	0.00	0.150	-	0.150
Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production	BCEW	-	-	3.606	0.00	-	3.606
Net Biogenic Carbon Emissions							0.00



INTERPRETATION AND LIMITATIONS

COMPARABILITY

Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance using EPD information shall consider all relevant information modules over the full life cycle of the products within the building. This PCR allows EPD comparability only when the same functional requirements between products are ensured and the requirements of ISO 21930:2017 §5.5 are met. In addition, to be compared EPDs must comply with the same core and sub-category PCRs (Part A and B) and include all relevant information modules. It should be noted that different LCA software and background LCI datasets may lead to different results for upstream or downstream of the life cycle stages declared.

FOREST MANAGEMENT

While this EPD does not address landscape level forest management impacts, potential impacts may be addressed through requirements put forth in regional regulatory frameworks, ASTM 7612-15 guidance, and ISO 21930 Section 7.2.11 including notes therein. These documents, combined with this EPD, may provide a more complete picture of environmental and social performance of wood products.

While this EPD does not address all forest management activities that influence forest carbon, wildlife habitat, endangered species, and soil and water quality, these potential impacts may be addressed through other mechanisms such as regulatory frameworks and/or forest certification systems which, combined with this EPD, will give a more complete picture of environmental and social performance of wood products.

SCOPE OF THE EPD

EPDs can complement but cannot replace tools and certifications that are designed to address environmental impacts and/or set performance thresholds—e.g. Type 1 certifications, health assessments and declarations, etc.

DATA

National or regional life cycle averaged data for raw material extraction does not distinguish between extraction practices at specific sites and can greatly affect the resulting impacts.

ACCURACY OF RESULTS

EPDs regularly rely on estimations of impacts; the level of accuracy in estimation of effect differs for any product line and reported impact when averaging data.



REFERENCES

1. American Center for Life Cycle Assessment (2019) ACLCA Guidance to Calculating Non-LCIA Inventory Metrics in Accordance with ISO 21930:2017.
2. Bare, J. (2012) Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI) - Version 2.1.
3. International Organization for Standardization (2006) ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and procedures.
4. International Organization for Standardization (2006) International Standard ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework.
5. International Organization for Standardization (2006) International Standard ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines.
6. International Organization for Standardization (2017) International Standard ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services.
7. LP® SmartSide® Product catalog www.lpcorp.com/media/6878/lp-smartside-trim-siding-product-catalog_v120.pdf
8. LTS (2019) DataSmart: <http://ltsexperts.com/services/software/datasmart-life-cycle-inventory/>
9. National Renewable Energy Laboratory (2019) U.S. Life Cycle Inventory Database <http://www.nrel.gov/lci/>
10. Oneil, E.E., L.R. Johnson, B.R. Lippke, J.B. Carter, M.E. McDill, P.A. Roth, and J.C. Finley. Life cycle impacts of Inland Northwest and Northeast/North central forest resources. (Accessed December 2020). Wood and Fiber Science 42(CORRIM special issue) 2010:29-51.
11. ATHENA Sustainable Materials Institute. 2018. A cradle-to-gate life cycle assessment of Canadian oriented strand board – OSB. 34 pp.
12. PRé Consultants BV (2018) SimaPro v8.5 LCA Software.
13. UL Environment (2019) Product Category Rule (PCR) Guidance for Building-Related Products and Services, Part A Life Cycle Assessment Calculation Rules and Report Requirements, UL 10010, v.3.2.
14. UL Environment (2019) Product Category Rule (PCR) Guidance for Building-Related Products and Services, Part B: Structural and Architectural Wood Products EPD Requirements, UL 10010-9 v.1.0.
15. Wernet, G., Bauer, C., Steubing, B., Reinhard, J., Moreno-Ruiz, E., & Weidema, B. (2016) The ecoinvent database version 3 (part I): overview and methodology. The International Journal of Life Cycle Assessment, 21, 1218–1230.
16. CORRIM (2020) Life Cycle Assessment of LP SmartSide Siding and Trim. December 2020 50 pp.



LP SmartSide®
TRIM & SIDING

LPCorp.com/SmartSide

© 2021 Louisiana-Pacific Corporation. All rights reserved. All trademarks are of or owned by Louisiana-Pacific Corporation.