Panelized Products Environmental Product Declaration

EPD for Panelized Linears and Grilles

9WOOD

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	ASTM INTERNATIONAL Helping our world work better
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	ASTM Program Operator Rules. Version: 8.0, Revised 04/29/20	
DECLARATION OWNER	9Wood 999 South A Street Springfield, OR 97477	9WOOD
DECLARATION NUMBER	EPD 1081	9Wood Panelized Linears and Grilles
DECLARED PRODUCT	Panelized Linears and Grilles	
DECLARED UNIT	0.093 m^2 (1 square foot) of Panelized Linears and Grilles	
REFERENCE PCR AND VERSION NUMBER	ISO 21930:2017 Sustainability in Building and Civil Engineering works – Core Rules for environmental Product Declaration of Construction Products and Services. [9] 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, v4.0 2022 [14] Part B: Non-Metal Ceiling and Interior Wall Panel EPD Requirements. Version 2.0. April 2021 [15]	
DESCRIPTION OF PRODUCT'S INTENDED APPLICATION AND USE	Custom ceiling and wall panels in commercial markets	
MARKETS OF APPLICABILITY	Construction Sector, North America	
DATE OF ISSUE	November 13, 2025	
PERIOD OF VALIDITY	5 years	
EPD TYPE	Product-Specific	
EPD SCOPE	Cradle to Gate	
YEAR OF REPORTED MANUFACTURER PRIMARY DATA	2023	
LCA SOFTWARE	SimaPro 10.1	
LCI DATABASES	USLCI [11], Ecoinvent 3.11 [3], Datasmart 2025 [10]	

LCIA METHODOLOGY	TRACI 2.2 v1.0 [5], CML-IA Baseline v3.11, CED LHV 1.01
THE SUB-CATEGORY PCR REVIEW WAS CONDUCTED BY:	Dr. Thomas Gloria (chair) t.gloria@industrial-ecology.com
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

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," v4.0 (January 2025), in conformance with ISO 21930:2017, serves as the core PCR,
with additional considerations from the USGBC/UL Environment Part A Enhancement (2017). Tim Brooke, ASTM International

☐ Internal ☐x External

INDEPENDENT VERIFIER This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas Gloria, Industrial Ecology

LIMITATIONS

- Environmental declarations from different programs (ISO 14025) may not be comparable.
- Comparison of the environmental performance of using EPD information shall be based on the product's use and impacts at the construction works level, and therefore EPDs may not be used for comparability purposes when not considering the construction works energy use phase as instructed under this PCR
- Full conformance with the PCR for Non-Metal Ceiling and Interior Wall Panel allows EPD comparability only when all stages of a life cycle have been considered, when they comply with all referenced standards (ISO 21930:2017 §5.5 , use the same sub-category Part B PCR, and use equivalent scenarios with respect to construction works. However, variations and deviations are possible. 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.

Description of Industry and Product

9Wood belongs to an industry that operates within the architectural woodwork and specialty ceiling and wall systems sector—a growing segment of the commercial interiors market. This sector includes custom wood ceiling panels, acoustic wood systems, decorative wall cladding, and fabricated assemblies designed for high-performance and visually impactful architectural spaces. Demand is driven by the commercial, institutional, and hospitality sectors, particularly in projects prioritizing acoustics, aesthetics, and sustainability.

9Wood specializes in a diverse range of custom wood ceiling and wall systems, categorized primarily into two major product families: Panelized and Progressive. Panelized product systems include pre-assembled wood panels designed for efficient installation and seismic compliance. All products are fabricated using a variety of wood species—both solid and veneered—options, and are often customized for finish, spacing, acoustics, and fire performance.

Panelized products are premium architectural ceiling and wall systems made from solid wood planks or wood veneer over particleboard cores. Standard panel thickness is typically ¾ inch or greater, with sizes up to 4 feet by 8 feet and custom dimensions. Panels can include acoustic perforations and sound-absorbing backers for enhanced performance. A variety of finishes from clear, stained, or to custom are used to match custom specifications.

Western hemlock (*Tsuga heterophylla*) dominates the Panelized product category with a survey composition of 67% (Tables 1). A variety of other hardwoods and softwoods—including white oak, walnut, Douglas-fir, cherry, maple, and ash are used. The inclusion of low-percentage species like bamboo, and poplar underscores the diverse material sourcing strategy used in 9Wood Products.

Table 1 Species and Representation for Panelized Products

Species	Latin Name	Survey Composition
Western hemlock	*Tsuga heterophylla*	66.61%
White oak	*Quercus alba*	10.81%
Walnut	*Juglans spp.*	6.31%
Douglas-fir	*Pseudotsuga menziesii*	3.85%
White birch	*Betula pendula*	3.15%
Cherry	*Prunus spp.*	2.83%
White maple	*Acer saccharinum*	2.74%
White ash	*Fraxinus americana*	1.71%
Mixed species	*Quercus spp., Carya spp., Acer spp., Fraxinus spp., Quercus rubra, Ulmus spp., Bambusoideae subfamily*	< 2.0%

The product profile presented in this EPD is for a declared unit of one square foot (1 ft^2 = 0.093 m^3) on Panelized Linears and Grilles. One square foot weights 1.18 kg with a thickness range from ¾ inch (19 mm) to 1½ inches (38 mm), depending on the design, core material, and application.

All 9Wood Products systems use Class A fire rated components and offer documentation for green building requirements. Manufactured products from 9Wood are categorized by United Nations Standard Products and Services Code (UNSPSC) 111220 01 and Construction Specifications Institute (CSI) codes Table 2)

Table 2. United Nations Standard Products and Services Code (UNSPSC) and Construction Specification Institute (CSI) Master Format Code for 9Wood Products.

Classification Standard	Category	Subcategory	Product Code
UNSPSC	Ceiling materials	Ceiling panels	30161600
UNSPSC	Acoustic ceiling tiles	Ceiling panels	30161601
UNSPSC	Ceiling panels	Wood ceiling systems	30161602
CSI	Column covers	Architectural column enclosures	05 75 30
CSI	Wall Panels	Interior wall systems	07 42 00
CSI	Fabricated Wall Panel Assemblies	Preassembled wall units	07 42 63
CSI	Ceilings	Interior ceilings	09 50 00
CSI	Acoustical Ceilings	Acoustical ceiling systems	09 51 00
CSI	Acoustical Panel Ceilings	Perforated panel systems	09 51 13
CSI	Acoustical Tile Ceilings	Drop-in tile systems	09 51 23
CSI	Specialty Ceilings	Custom ceiling solutions	09 54 00
CSI	Specialty Ceilings	Custom ceiling solutions	09 54 05
CSI	Decorative Panel Ceilings	Architectural ceiling panels	09 54 33
CSI	Textured Ceilings Panels	Surface-finished panels	09 56 00
CSI	Interior Wall Paneling	Wood wall cladding	09 78 00

Methodological Framework

The underlying LCA [13] was performed in conformance with ISO 14040/44 [7,8], ISO 21930 [9] and EN15804 [4], as well as the PCR.

Type of EPD and Life Cycle Stages

This EPD is intended to represent a product-specific life cycle assessment (LCA) for 9Wood Panelized Products (Linears and Grilles) made from solid wood, veneers, and particleboard produced in Springfield, Oregon. 9Wood provided production data, resource use, energy and fuel use, transportation distances, and onsite processing emissions. These data were weighted average based on production to produce the life cycle inventory data for the life cycle impact assessment (LCIA). The underlying LCA [13] investigates Panelized product production from cradle-to-gate. Information modules included in the LCA are shown in Table 3. This EPD includes mandatory modules A1-A3 for a cradle-to-gate analysis.

Table 3. Life Cycle Stages & Information Modules per ISO 21930.

PRODUCTION STAGE			CONSTRUCTION STAGE		USE STAGE							END-OF-LIFE STAGE				OPTIONAL BENEFITS
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Extraction and up-stream production	Transport to factory	Manufacturing	Transport to site	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Building Operational Energy Use During Product Use	Building Operational Water Use During Product Use	Deconstruction	Transport	Waste	Disposal	Reuse, Recycle, & Recovery benefits
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

System Boundaries and Product Flow Diagram

The product system described in Figure 2 includes the following information modules and unit processes:

A1 - RAW MATERIAL EXTRACTION	A1 includes the cradle to gate upstream forestry operations which may include growing seedlings in a nursery, planting the seedlings, managing the forest (which may include pre-commercial and commercial thinning), fertilization, and final harvesting, with the logs brought to a landing and loaded on the truck. Also included in A1 is the production of solid wood, veneers, and particleboard, finishes and adhesives.
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 Panelized Linears and Grilles including energy consumption and fuel use, resource use, water use, emissions to air and water, waste disposal, and packaging. Packaging materials represent around 15 percent of the mass of the main product. The packaging is allocated 100 percent to the product.

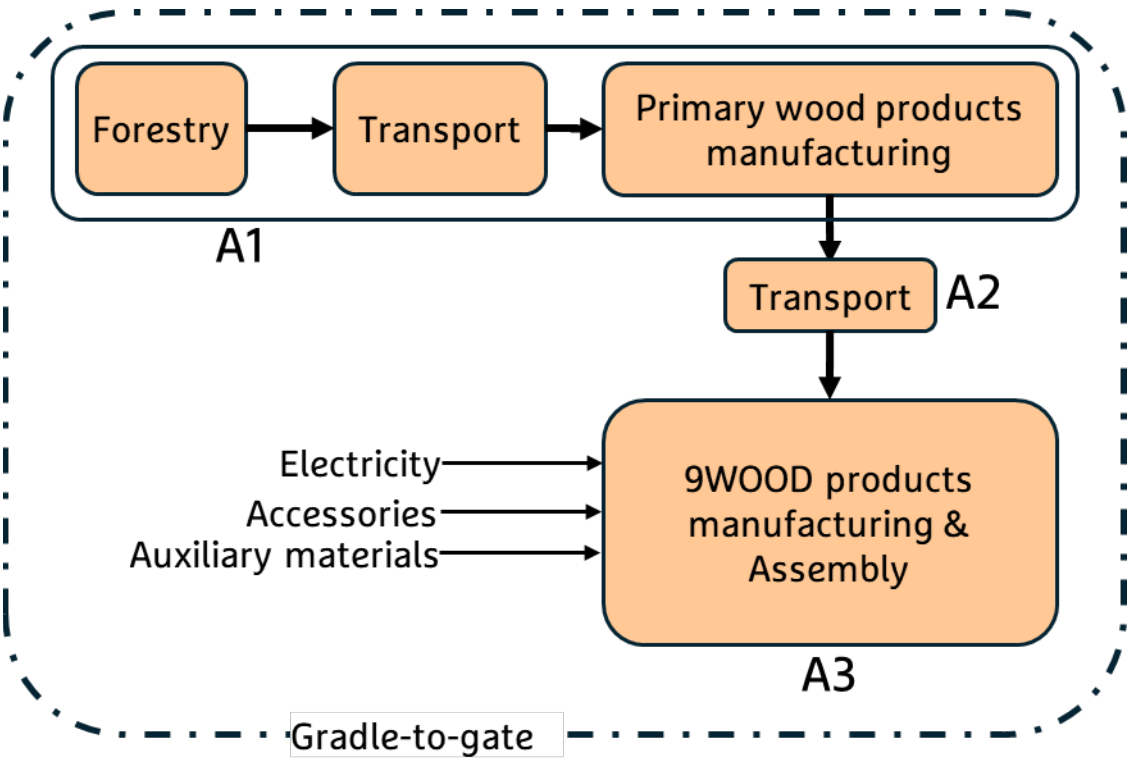


Figure 1. Cradle-to-Gate (A1-A3) System Boundary for 9wood Products.

Declared Unit

The declared product consists mostly of wood (94%) by mass. The product composition is shown in Table 4.

Table 4 Product Composition for Panelized Linears and Grilles.

Inputs	Composition by Mass
Solid, Softwood	53.1%
Particleboard	25.4%
Plywood	9.4%
Finishes	5.2%
Solid, Hardwood	4.6%
Veneer	1.8%
Glue	0.5%
Total	100%

Allocation Methods

Allocation is the method used to distribute environmental impacts among multiple products or functions that share a common production process. For 9Wood's Product, the primary input material is solid lumber, wood veneer, or particleboard, processed through a series of fabrication steps that generate by-products such as sawdust, trim, and offcuts. The by-products have no economic value and are disposed of as waste therefore 100% allocation is assigned to the product.

Following the PCR, Parts A and B (UL 2022, 2021), allocation is based on physical properties—typically mass. For this study, mass-based allocation was applied to assign environmental burdens between the primary products and by-products. Packaging materials are not associated with any by-products generated and are therefore allocated entirely (100%) to the final product.

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 2020.

Third party verified ISO [7,8] secondary LCI data sets contribute 13-67 % of total impact to any of the required impact categories identified by the applicable PCR [14,15].

Treatment of Biogenic Carbon

Biogenic carbon emissions and removals are reported in accordance with ISO 21930 7.2.7. and 7.2.12. ISO 21930 requires a demonstration of forest sustainability to characterize carbon removals with a factor of -1 kg CO_2eq/kg CO_2. ISO 21930 Section 7.2.11 Note 2 states the following regarding demonstrating forest sustainability: "Other evidence 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 CO_2eq/kg CO_2.

Environmental Parameters Derived from the LCA

The impact categories and characterization factors for the LCIA were derived from the U.S. EPA Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts - TRACI 2.2 v1.00 [3]. The total primary energy consumption is tabulated from the LCI results based on the Cumulative Energy Demand Method (CED, LHV, v1.01) published by Ecoinvent [3]. 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 10.1 [12] was used to organize and accumulate the LCI data, and to calculate the LCIA results (Table 5).

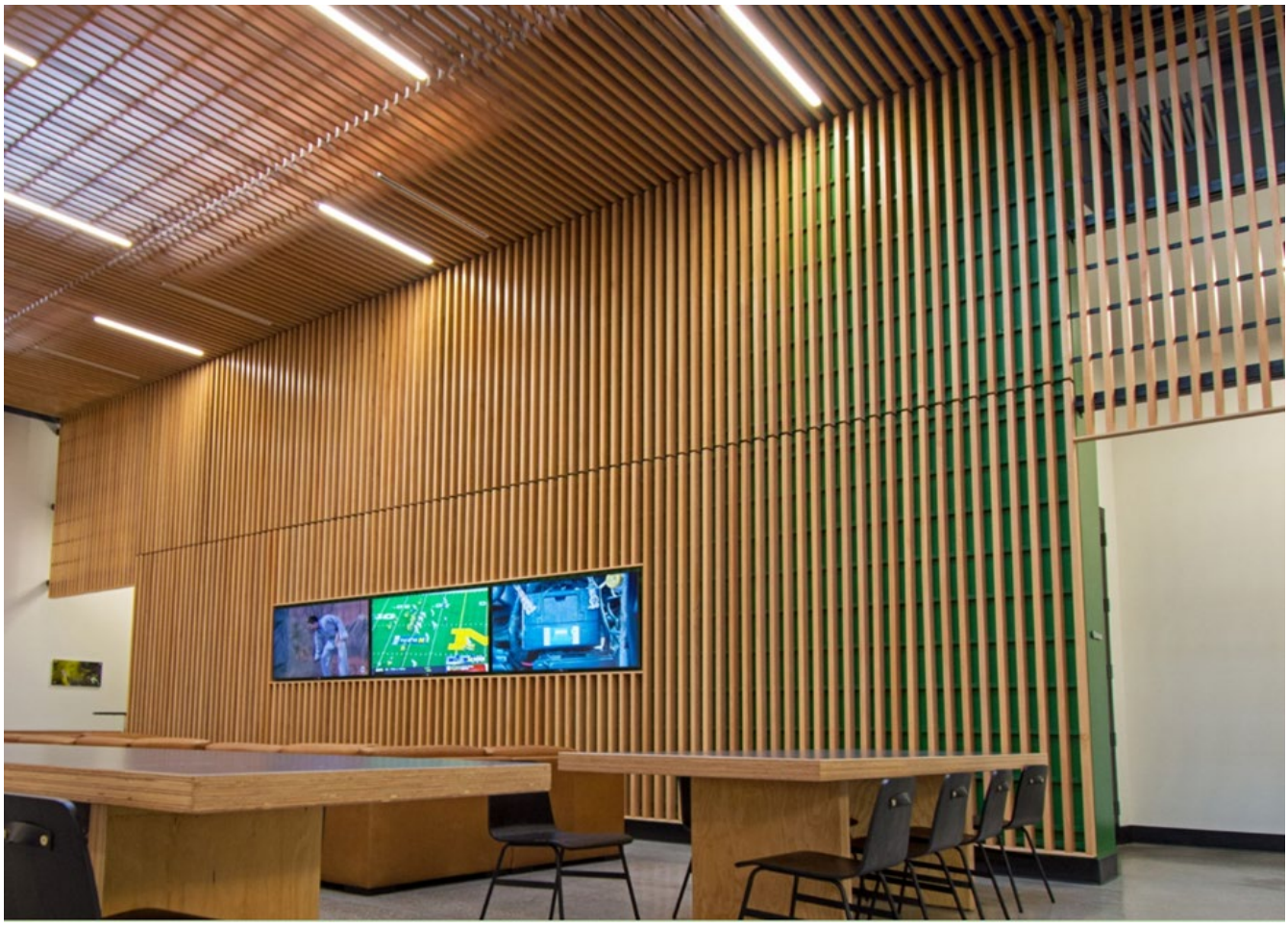


Table 5. Selected Impact Category Indicators and Inventory Parameters.

Impact Indicators per ISO 21930	Abbreviation	Units	Method
Core Mandatory Impact Indicator			
Global warming potential, Total	GWP_{TOTAL}	kg CO_2 eq	$GWP_{BIOGENIC}$ + GWP_{FOSSIL}
Global warming potential, Biogenic	$GWP_{BIOGENIC}$	kg CO_2 eq	TRACI 2.2+ LCI Indicatory
Global warming potential, Fossil	GWP_{FOSSIL}	kg CO_2 eq	TRACI 2.2
Depletion potential of the stratospheric ozone layer	ODP	kg CF-11 eq	TRACI 2.2
Acidification potential of soil and water sources	AP	kg SO_2 eq	TRACI 2.2
Eutrophication potential, Marine	EP, Marine	kg N eq	TRACI 2.2
Eutrophication potential, Freshwater	EP, Freshwater	kg P eq	TRACI 2.2
Formation potential of tropospheric ozone	SFP	kg O_3 eq	TRACI 2.2
Abiotic depletion potential (ADP fossil) for fossil resources;	ADPf	MJ, LHV	CML-IA Baseline V3.11
Use of Primary Resources			
Renewable primary energy carrier used as energy	RPRE	MJ, LHV [a/]	CED (LHV) V1.01
Renewable primary energy carrier used as material	RPRM	MJ, LHV	LCI Indicator
Non-renewable primary energy carrier used as energy	NRPRE	MJ, LHV	CED (LHV) V1.01
Renewable primary energy carrier used as material	NRPRM	MJ, LHV	LCI Indicator
Secondary material, secondary fuel and recovered energy			
Secondary material	SM	kg	LCI Indicator
Renewable secondary fuel	RSF	MJ, LHV	LCI Indicator
Non-renewable secondary fuel	NRSF	MJ, LHV	LCI Indicator
Recovered energy	RE	MJ, LHV	LCI Indicator
Mandatory Inventory Parameters			
Consumption of freshwater resources;	FW	m^3	LCI Indicator
Indicators Describing Waste			
Hazardous waste disposed	HWD	kg	LCI Indicator
Non-hazardous waste disposed	NHWD	kg	LCI Indicator
High-level radioactive waste, conditioned, to final repository	HLRW	m^3	LCI Indicator
Intermediate- and low-level radioactive waste, conditioned, to final repository	ILLRW	m^3	LCI Indicator
Components for re-use	CRU	kg	LCI Indicator
Materials for recycling	MR	kg	LCI Indicator
Materials for energy recovery	MER	kg	LCI Indicator
Recovered energy exported from the product system	EE	MJ, NCV	LCI Indicator
Additional Inventory Parameters for Transparency			
Biogenic Carbon Removal from Product	BCRP	kg CO2e	Manual
Biogenic Carbon Emission from Product	BCEP	kg CO2e	Manual
Biogenic Carbon Removal from Packaging	BCRK	kg CO2e	Manual
Biogenic Carbon Emission from Packaging	BCEK	kg CO2e	Manual
Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	BCEW	kg CO2e	Manual
Biogenic Carbon Removal from Product	BCRP	kg CO2e	Manual

Life Cycle Impact Assessment Results

Tables 6-8 presents the cradle-to-gate (A1-A3) LCIA and LCI parameter results for the functional unit of 1 ft^2 (0.093 m^2) of Panelized Products. No permanent carbon storage is included in the cradle-to-gate (A1-A3) results. As a result, the biogenic carbon balance for the cradle-to-gate portion of the life cycle is net neutral. Cradle-to-gate results for lumber on a relative basis are presented in Tables 9-11 and Figure 2.

Table 6. Cradle-to-Gate LCIA Results for 1 ft^2 (0.093 m^2) of Panelized Products – Absolute Basis.

Core Mandatory Impact Indicator	Total	A1	A2	A3
GWP_{TOTAL} [kg CO_2 eq]	1.83E+00	-2.10E+00	4.38E-02	3.88E+00
$GWP_{BIOGENIC}$ [kg CO_2 eq]	0.00E+00	-2.52E+00	0.00E+00	2.52E+00
GWP_{FOSSIL} [kg CO_2 eq]	1.83E+00	4.25E-01	4.38E-02	1.36E+00
ODP [kg CF-11eq]	3.75E-08	9.83E-09	5.36E-11	2.76E-08
AP [kg SO_2 eq]	8.91E-03	3.06E-03	2.42E-04	5.61E-03
EP_{MARINE} [kg N eq]	1.42E-03	6.83E-04	5.86E-05	6.77E-04
$EP_{FRESHWATER}$ [kg P eq]	2.83E-04	3.36E-05	4.99E-07	2.49E-04
SFP [kg O_3 eq]	4.62E-01	8.42E-02	6.99E-03	3.71E-01
ADP_{FOSSIL} [MJ, LHV]	2.32E+01	5.51E+00	5.48E-01	1.72E+01

Table 7. Cradle-to-Gate Resource use Results for 1 ft^2 (0.093 m^2) of Panelized Products –Absolute Basis.

Use of Primary Resources	Total	A1	A2	A3
RPRE [MJ, LHV]	1.56E+01	8.53E+00	1.22E-03	7.11E+00
RPRM [MJ, LHV]	2.29E+01	2.29E+01	0.00E+00	0.00E+00
NRPRE [MJ, LHV]	2.55E+01	6.05E+00	5.56E-01	1.89E+01
NRPRM [MJ, LHV]	9.16E-02	9.16E-02	0.00E+00	0.00E+00
SM [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m^3]	1.12E+01	1.45E+00	7.25E-03	9.73E+00

Table 8. Cradle-to-Gate Output Flows for 1 ft² (0.093 m²) of Panelized Products – Absolute Basis.

Indicators Describing Waste	Total	A1	A2	A3
HWD [kg]	4.87E-03	3.26E-03	6.55E-07	1.61E-03
NHWD [kg]	3.79E-01	7.16E-02	7.68E-04	3.06E-01
HLRW [m³]	1.87E-09	6.32E-10	0.00E+00	1.24E-09
ILLRW [m³]	2.24E-08	4.26E-09	1.72E-11	1.81E-08
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 9. Cradle-to-Gate LCIA Results for 1 ft² (0.093 m²) of Panelized Products – Relative Basis.

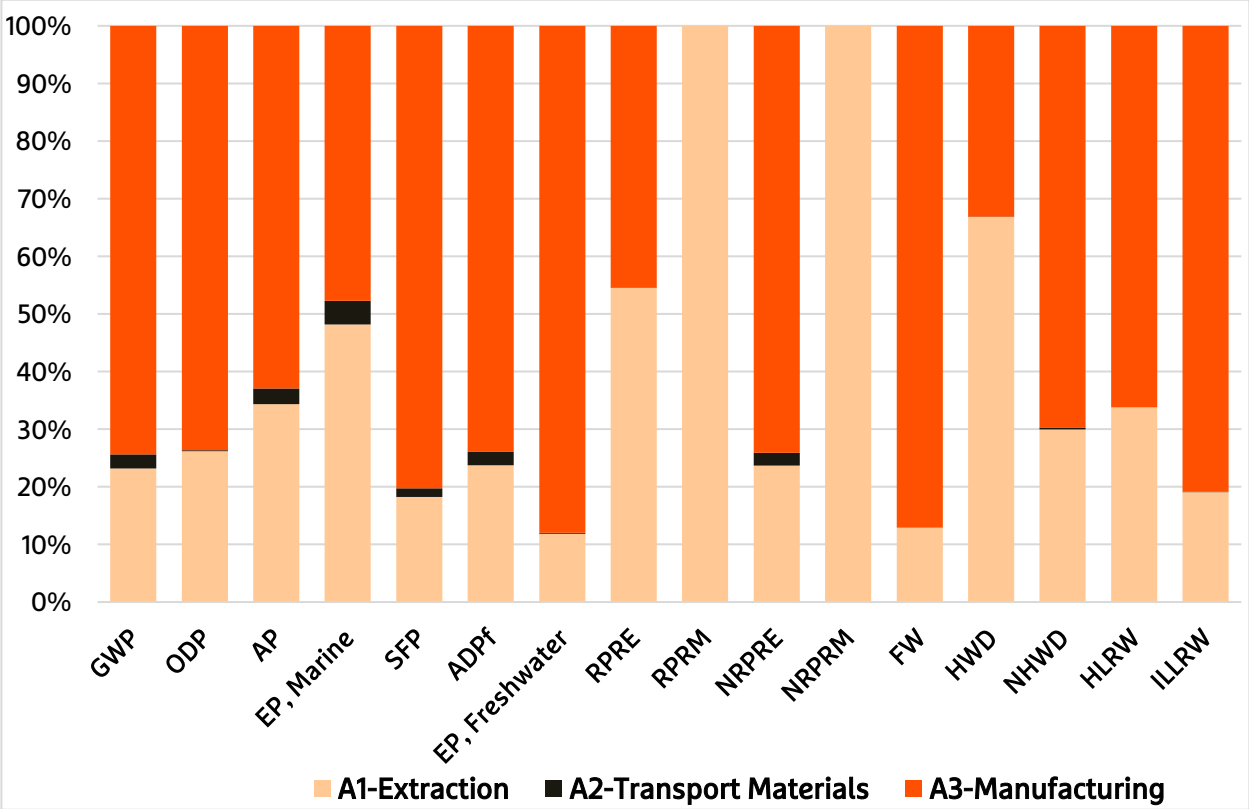
Core Mandatory Impact Indicator	Total	A1	A2	A3
GWP_{FOSSIL} [kg CO_2 eq]	100.0%	23.2%	2.4%	74.4%
ODP [kg CF-11eq]	100.0%	26.2%	0.1%	73.7%
AP [kg SO_2 eq]	100.0%	34.4%	2.7%	62.9%
EP_{MARINE} [kg N eq]	100.0%	48.2%	4.1%	47.7%
$EP_{FRESHWATER}$ [kg P eq]	100.0%	11.9%	0.2%	88.0%
SFP [kg O_3 eq]	100.0%	18.2%	1.5%	80.3%
ADP_{FOSSIL} [MJ, LHV]	100.0%	23.8%	2.4%	73.9%

Table 10. Cradle-to-Gate LCIA Results (Resources) for 1 ft² (0.093 m²) of Panelized products – Relative Basis.

Use of Primary Resources	Total	A1	A2	A3
RPRE [MJ, LHV]	100.0%	54.5%	0.0%	45.5%
RPRM [MJ, LHV]	100.0%	100.0%	0.0%	0.0%
NRPRE [MJ, LHV]	100.0%	23.7%	2.2%	74.1%
NRPRM [MJ, LHV]	100.0%	100.0%	0.0%	0.0%
FW [m³]	100.0%	13.0%	0.1%	87.0%

Table 11. Cradle-to-Gate LCIA Results (Wastes) for 1 ft² (0.093 m²) of Panelized Products – Relative Basis.

Indicators Describing Waste	Total	A1	A2	A3
HWD [kg]	100.0%	66.9%	0.0%	33.1%
NHWD [kg]	100.0%	30.0%	0.3%	69.7%
HLRW [m³]	100.0%	33.8%	0.0%	66.2%
ILLRW [m³]	100.0%	19.1%	0.1%	80.8%



GWP	Global warming potential	RPRM	Renewable primary energy carrier used as material
ODP	Depletion potential of the stratospheric ozone layer	NRPE	Non-renewable primary energy carrier used as energy
AP	Acidification potential of soil and water sources	NRPRM	Renewable primary energy carrier used as material
EP, Marine	Eutrophication potential, Marine	FW	Consumption of freshwater resources
SFP	Formation potential of tropospheric ozone	HWD	Hazardous waste disposed of
ADPf	Abiotic depletion potential (ADP fossil) for fossil resource	NHWD	Non-hazardous waste disposed of
EP, Freshwater	Eutrophication potential, Freshwater	HLRW	High-level radioactive waste, conditioned, to final repository
RPRM	Renewable primary energy carrier used as energy	ILLRW	Intermediate- and low-level radioactive waste, conditioned, to final repository

Figure 2. Cradle-to-Gate LCIA Results for 1 ft² (0.093 m²) of Panelized Products – Relative Basis.

Biogenic Carbon Results

Cradle-to-Gate Results

Wood is a biobased material and thus contains biogenic carbon. The accounting of biogenic carbon follows the requirements set out in ISO 21930:2017 where biogenic carbon enters the product system (removal) as primary or secondary material. Carbon removal is considered a negative emission. The biogenic carbon leaves the system (emission) as a product, by-products, or directly to the atmosphere when combusted for heat energy. These mass flows of biogenic carbon from and to nature are listed in the LCI and are expressed in kg CO_2.

Table 12 shows the biogenic carbon removal and emissions. All carbon dioxide flows (kg CO_2) presented in Table 12 are unallocated to include by-products leaving the system boundary in module A3. Even though the system boundary for this LCA only includes module A1-A3, in accordance with ISO 21930, emission from packaging (BCEK) is reported in A5-Construction and emission from the main product (BCEP) is reported in C3/C4-End-of-Life[1]. The net carbon emission across the cradle-to-gate life cycle is zero. It is assumed that all carbon removed from the atmosphere is eventually emitted to the atmosphere as CO_2.

Table 12. Biogenic Carbon Inventory Parameters for 1 ft² (0.093 m²) of Panelized Products, Unallocated

	A1	A2	A3	A5	C3/C4	Total
BCRP [kg CO_2]	(2.5214)	-	-	-	-	(2.5214)
BCEP [kg CO_2]	-	-	0.5150	-	2.0064	2.5214
BCRK [kg CO_2]	-	-	(0.2824)	-	-	(0.2824)
BCEK [kg CO_2]	-	-	-	0.2824	-	0.2824
BCEW [kg CO_2]	-	-	-	-	-	-

Cradle-to-Grave Results

The product system represented in this EPD includes the information modules 'A1 Extraction and upstream production', 'A2 Transport to factory' and 'A3 Manufacturing'. As per ISO 21930, the net biogenic carbon emissions across the reported modules are zero (carbon neutral). This conservative assumption excludes the permanent sequestration of biogenic carbon if the LCA were to consider the typical end-of-life treatment for wood products, landfilling.

UL Environment published an addendum to the reference PCR that estimates the emissions from landfilling of wood products [16, Appendix A]. The carbon sequestration addendum is based on the United States EPA WARM model and aligns with the biogenic accounting rules in ISO 21930 Section 7.2.7 and Section 7.2.12. Because the end-of-life fate of this material is unknown, we have applied the default disposal pathway from the PCR Part A (UL 2018) Section 2.8.5, 100% landfill.

[1] These products are reported in modules outside the scope of this LCA system boundary to provide reference for EoL waste and emissions if a full cradle-to-grave LCA were to be performed.

The following results apply the addendum methodology [16, Appendix A] to the biogenic carbon present in the primary product as it leaves the manufacturer in Module A3[2].

1 ft² Panelized Products = 1.0944 oven dry kg = 0.5472 kg carbon = 2.0064 kg CO_2 eq

Carbon sequestered in product at manufacturing gate:
2.0064 kg CO_2 eq = -2.0064 kg CO_2 eq

Methane emitted from fugitive landfill gas:
0.0039 kg CH_4 = 0.0968 kg CO_2 eq emission[3]

Carbon dioxide emitted from fugitive landfill gas and the combustion captured landfill gas:
0.2254 kg CO_2 eq emission[4]

Permanent carbon sequestration, net of biogenic carbon emissions:
1.6842 kg CO_2 eq = -1.6842 kg CO_2 eq emission[5]

[2] Background assumptions for EoL and 100% Landfill: methane emission = 3.53e-03 kg CH4/kg dry wood; carbon dioxide emission = 2.06e-01 kg CO2/kg dry wood (UL 2020).
[3] Methane emissions= 3.53E-03 kg CH4/kg of dry wood X 1.0944 kg of dry wood = 0.0039 kg CH4; kg CO2 eq = 0.0039 CH4 X 25.05 kg CH4/kg CO2 eq = 0.0968 kg CO2 eq
[4] Carbon dioxide emissions= 2.06E-01 kg CO2/kg of dry wood x 1.0944 = 0.2254 kg CO2
[5] Final sequestration, net of biogenic emissions = CO2 eq in product at gate = 2.0064 – (0.0968+0.2254) = 1.6842 kg CO2 eq

LCA Interpretation

Comparability

Environmental declarations from different programs [6] 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.

Limitations

This LCA was created using manufacturer average data for upstream materials. Variation can result from differences in supplier locations, manufacturing processes, manufacturing efficiency, and fuel type used. This LCA does not report all of the environmental impacts due to manufacturing of the product but rather reports the environmental impacts for those categories with established LCA-based methods to track and report. Unreported environmental impacts include (but are not limited to) factors attributable to human health, land use change, and habitat destruction. In order to assess the local impacts of product manufacturing, additional analysis is required.

Additional Environmental Information

9Wood sources its wood fiber exclusively from legally and sustainably managed forests. The company and its suppliers report fiber sourcing data in alignment with the three categories defined by ASTM D7612: Standard Practice for Categorizing Wood and Wood-Based Products According to Their Fiber Sources (ASTM 2021)[2]. These categories include:

1. **Non-controversial Sources** – Fiber originating from areas with a low risk of illegal logging, compliant with applicable legal and proprietary standards.
2. **Responsible Sources** – Wood acquired through procurement systems that are independently certified or subject to robust regulatory frameworks enforcing forestry best management practices (BMPs). Examples include FSC Controlled Wood and SFI Fiber Sourcing.
3. **Certified Sources** – Fiber verified through internationally recognized forest management certification systems such as the Forest Stewardship Council (FSC), Sustainable Forestry Initiative (SFI), Programme for the Endorsement of Forest Certification (PEFC), American Tree Farm System (ATFS), or the Canadian Standards Association (CSA).

The facility represented in this LCA reported on average, 100% of the fiber entering their mills to be non-controversial (legal) and 73% from independently certified forests. To meet these standards, 9Wood and its supply chain maintain documentation and tracking systems that ensure logs are harvested legally and sustainably, protecting air and water quality, biodiversity, and forest regeneration. This commitment supports 9Wood's broader sustainability objectives and contributes to responsible material sourcing as required by Environmental Product Declarations (EPDs) and green building certification systems.

Forest Management

While this EPD does not address landscape level forest management impacts that influence forest carbon, wildlife habitat, endangered species, and soil and water quality, these potential impacts may be addressed through requirements put forth in regional regulatory frameworks, ASTM 7612-21 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.

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.

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