

ABOUT ROSEBURG

Since 1936, Roseburg has been a major manufacturer and supplier of high-quality wood products. From humble beginnings in Oregon, we've grown through smart management of natural resources, state-of-the-art manufacturing facilities, talented and experienced team members and a reputation for reliably supplying quality wood products to a wide variety of clients.

Unique in today's wood products industry with a vertically integrated structure driven by over 600,000 acres of our own sustainably managed forestlands in Oregon, Virginia and North Carolina, Roseburg products are shipped and used throughout North America and the Pacific Rim.

3660 Gateway St, Springfield, OR 97477
800.245.1115 | roseburg.com

SANDED PLYWOOD 032023

SOFTWOOD PLYWOOD

ROSEBURG FOREST PRODUCTS COMPANY

Founded in 1936, Roseburg is a privately owned, vertically integrated company that owns and sustainably manages more than 600,000 acres of timberland in the U.S. The company converts those renewable resources into high quality, durable wood products including lumber, softwood and hardwood plywood panels, glues, laminated veneer lumber, and composite panels such as medium density fiberboard and particleboard. Roseburg products are widely distributed throughout North America.

Softwood Plywood

According to ISO 14025
and ISO 21930:2017

EPD PROGRAM AND PROGRAM OPERATOR
NAME, ADDRESS, LOGO AND WEBSITE

UL ENVIRONMENT, 333 PFINGSTERN RD., NORTHBROOK, IL 60061, [HTTPS://WWW.UL.COM](https://www.ul.com)

GENERAL PROGRAM INSTRUCTIONS
AND VERSION NUMBER

UL Environment Environmental Product Declaration Program, GENERAL INSTRUCTIONS, VERSION MARCH 202

MANUFACTURER NAME AND ADDRESS

Roseburg Forest Products
3660 Gateway Street
Springfield, OR 97477

DECLARATION NUMBER

UL Provided

DECLARED PRODUCT &
FUNCTIONAL UNIT OR DECLARED UNIT

1 cubic meter of softwood

ISO 21930:2017 serves as the core PCR and:

REFERENCE PCR AND VERSION NUMBER

UL Part A: Product Category Rules for Building Products and Services, Life Cycle Assessment Calculation Rules and Report Requirements, v3

UL Part B: Product Category Rule for Building Products and Services, Part B: Structural and Architectural Wood Products, v2

MARKETS OF APPLICABILITY

North America

DATE OF ISSUE

UL Provided

PERIOD OF VALIDITY

UL Provided

EPD TYPE

Product specific

EPD SCOPE

Cradle to gate

YEARS OF REPORTED PRIMARY DATA

2022

LCAS SOFTWARE & VERSION NUMBER

SimaPro V9

LCI DATABASE & VERSION NUMBER

Ecoinvent 3.9.1, USLCI

LCI METHODOLOGY & VERSION NUMBER

TRACI 2.1, IPCC AR5

The UL Part A review was conducted by:

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

INTERNAL

EXTERNAL

Jack Geibig

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

Jack Geibig

Softwood Plywood

According to ISO 14025
and ISO 21930:2017

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

Jack Geibig

LIMITATIONS

Exclusion EPDs do not indicate that any environmental or social performance benchmarks are met, as there may be not typically address the specific environmental impacts of raw material extraction, nor are EPDs a complete assessment. EPDs cannot replace tools and certifications that are designed to address these impacts and/or set performance targets, declarations, environmental assessments, etc.

Accuracy of Results regularly rely on estimates and factors. Accuracy in estimation of effect differs for any particular impact category.

Comparability EPDs from different programs may not be comparable with a PCR allows EPD comparability only when all have been considered in they comply with all referenced standards, RSB, and use equivalent scenarios with respect to the building energy phase as instructed under this PCR. However, variations and deviations are possible". Example of variations: Different LCA differences and results of upstream or downstream of the life cycle. Comparison of the environmental performance of Structural and Architectural information shall be based on the product's use and impacts at the building level and phase where EPDs are used.

Foreword

This Type III environmental declaration is developed according to ISO 21930 (SWPW). This EPD reports environmental impacts based on established life cycle reported environmental impacts are estimates, and their level of accuracy may vary. LCAs do not specifically address societal issues related to resource depletion, toxic effects of products on human health, land use change and habitat destruction. Forest management regulations address some of these issues. The product in this EPD conforms to product environmental performance against any benchmark.

Product System

Product Description

Roseburg is a leading producer of softwood plywood panels in North America, softwood plywood products for building construction applications. Their plywood is structurally sound for greater durability and longer life. Common applications of Roseburg plywood products include cabinetry, underlayment, sheathing, garage doors, exterior storage shelving, racks and mezzanine floors, base for countertops, sheds, boat exterior trim and soffits. This softwood plywood products are made primarily from Western Douglas fir. Roseburg produces softwood plywood in Coquille, and Riddle, Oregon.

Application and Technical Data

Common applications of Roseburg's softwood plywood products are underlayment, sheathing, garage doors, exterior signage, concrete forms, storage shelving, racks and sheds, boat houses, decks, pontoon boats, and exterior trim and soffits.

Common plywood dimensions are:

- Lengths 8', 9', 10'
- Widths: 4', 5'
- Thickness 1/8" to 1"

The primary species used in Roseburg's Softwood Plywood is Douglas fir.

Production

Upstream forest operations include forest management, logging, and loading the harvested roundwood onto a truck. The roundwood is then transported from the forest road to the mill. The logs are lathed with a rotating drive to the necessary dimensional specifications. Next, the veneer is dried and cross-banded to form plywood panels that meet or exceed a variety of grades and performance standard. The veneered softwood plywood is sent to the press and cured. Further finishing including trimming, patching, and sanding may occur depending on the final product being manufactured. Finally, the product is packaged for shipping. All of these processes require electricity, fuels, and wood inputs as biomass fuel.

The raw materials for the product were obtained from various parts of the US depending on the location of the facility and the product type. In general, the product systems are built using wood and resin inputs. The materials are delivered to the manufacturing facility via truck. The distances were modeled by material and were calculated using the supplier location and the location of manufacturing. All products produced are packaged using wood battens (made from wood waste generated at the mill), minimal plastic strapping, and some product lines utilize protective cardboard covers.

Figure C1-1: Cradle-to-gate product system for softwood plywood

Methodology of the Underlying LCA

Declared Unit

The declared unit is one cubic meter (1 m³) of softwood plywood. Table 1 shows additional details related to the functional unit.

Table 1: Declared Unit Details

	VALUE	UNIT
Declared Unit	1	m ³
Mass	484	Dry kg
Density (dry)	484	kg/m ³
Moisture Content	7	%
Thickness	9.5	mm

The weighted compositions of softwood plywood at both the Riddle and Coquille facilities are shown in Table 2. The production-weighted average was calculated with 58% Coquille and 42% Riddle.

Table 2: Material Composition per Functional Unit

	WEIGHTED COMPOSITION [%]
Logs	79.0
Veneer	17.4
Resin	2.72
Other (wood inputs)	0.784

The product is packaged in plastic strapping made from plastic, cardboard pallets, and batten made from wood. We recommend the packaging materials are reused where possible. The resin used is phenolic resin. The other inputs are mostly, modal, wheat flour and sodium hydroxide.

No hazardous materials are contained in, or result from the production of, a product. Information pertaining to the classification of the substances used to manufacture the product, including composition information, first aid measures, fire fighting measures, and storage, exposure controls/PPE, physical and chemical properties, stability, toxicity information, ecological information, disposal considerations, transport information, and other relevant information, is provided in the SDS for each material.

contained in the product Safety Data Sheet which is available to download from www.roseburg.com

System Boundaries

As shown in Figure 2, the system boundary includes the extraction of raw materials, transportation of raw materials, secondary materials, and any fuels from the mill and the manufacturing of the wood construction product, including any necessary inputs. Inputs and outputs that are excluded from the analysis, denoted by MND or “module not declared.”

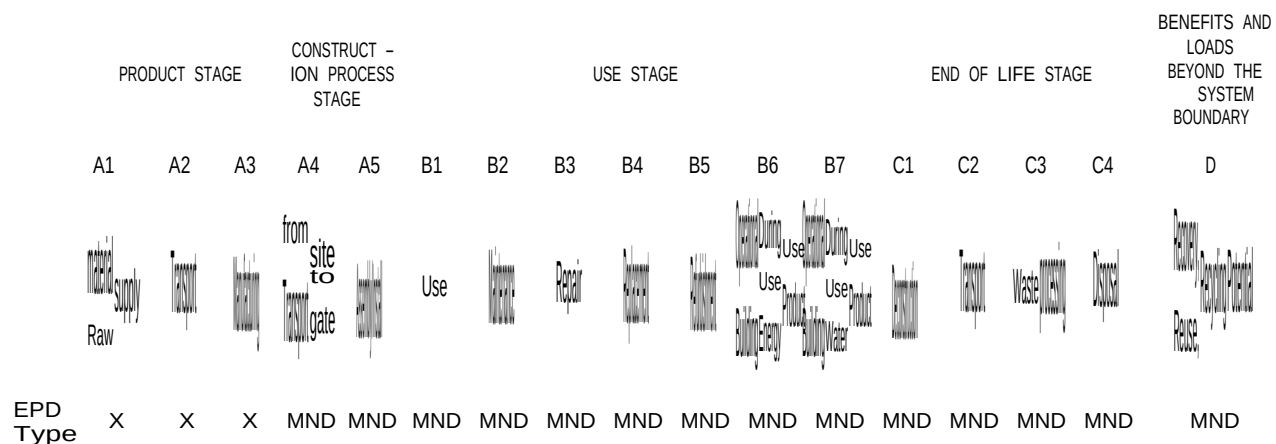


Figure 2: Life cycle stages of wood products (those included are marked with an X)

Cutoff Rules

Material and energy inputs greater than 1% (based on total mass of the final product) were included in the analysis. Material or energy inputs less than 1% were included if sufficient to have significant environmental impacts and/or the material input was thought to have significant environmental impacts, and environmental impacts are less than 5% based on total weight of the final product.

The list of excluded materials and energy inputs include:

- Some material inputs may have been excluded within the datasets used for the analysis. These inputs have been critically reviewed and conform to the exclusion requirement of the ISO 14025 and ISO 21930:2017 standards.
- Capital material and infrastructure

Beyond this, no inputs or outputs were actively excluded.

Background Data

Background data for upstream and downstream activities from 2002 to 2013, and

Data Quality

Overall data quality is considered good. Improvements can be made through the incorporation of more regional specificity, both in terms of energy and technology, which is appropriate in relation to the goal, scope, and budget of the project.

Primary data in the form of energy consumption and water consumption were not collected during the same time frame. The resulting energy and water per unit of production at the facilities under study. Overall, primary energy and water data quality are considered good.

Primary data also includes the bills of materials used to formulate the product. This data is considered excellent. Upstream data quality can be improved through the use of secondary datasets.

Period under Review

This study is intended to represent production for the year 2022.

Region under Review

SWPW production occurs in Riddle, and Coquille, Oregon.

Treatment of Biogenic Carbon

The product system represented in this EPD includes the information modules 7.2.7, if based on material containing biogenic carbon leaves the studied product system. Between product systems in information modules C1 to C4 (or any other information module) and associated flow of biogenic carbon is reported as an export of LCI and characterized with +1 kg CO₂e/kg CO₂ of biogenic carbon in the calculation information module C1 to C4 (or any other information module). The following biogenic carbon present in the primary product as it leaves the manufacturer.

Allocation

Multi-output allocation generally follows the requirements of ISO 14044, Section 6.4. Allocation was determined based on the requirements of the standard. Additionally, it considers the following as per the PCR:

"Mass should be used as the primary basis for allocation in this Part B. Allocation on the basis of energy or other appropriate factors may be used but only when justified."

This allocation method applies both to wood waste as an output and as an input to the manufacturing process, ancillary material, and energy materials. The allocation method aligns with the average EPDs on the products under study.

Comparability

This PCR allows EPD comparability only when the same functional requirements

the requirements of ISO 21930:2017 §5.5 are met. It should be noted that different datasets may lead to differences results for upstream or downstream of the life cycle of the products within the building. the environmental performance using EPD information shall consider all relevant cycle of the products within the building.

Additional Statements

While this EPD does not address landscape level forest management impacts, product through requirements put forth in regional regulatory frameworks, ISO 21930:2017 7.2.11 including notes therein. These documents, combined with this EPD, may provide a complete picture of environmental and social performance of wood products.

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

EPDs can complement but cannot replace tools and certifications that are designed to and/or set performance thresholds, health assessments and declarations.

National or regional life cycle averaged data for raw material extraction and processing practices at specific sites and can greatly affect the resulting impacts.

EPDs can complement but cannot replace tools and certifications that are designed to and/or set performance thresholds, health assessments and declarations.

Accuracy of Results: EPDs regularly rely on estimations of impacts; the level of detail for any particular product line and reported impact when averaging weighted values and average composition.

Life Cycle Assessments Results

The impact categories presented are potentials, i.e., they are approximations of the impact that could occur if the emissions follow the underlying impact pathway and conditions in the receiving environment. In addition, the inventory only captures environmental load that corresponds to the relative approach. LCIA results are expressions only and do not represent exacting thresholds, safety margins, or risk.

The LCIA results are presented for an average softwood plywood product in Table 8.

Table 8: Weighted average LCIA Results of Softwood Plywood produced by Roseburg

IMPACT CATEGORY	TOTAL	A1	A2	A3
LCIA Impact Indicators 2.1 and IPCC AR5				
IPCC AR5 GWP incl. bio [kg CO ₂ e]	-3.76E+01	-2.22E+02	7.63E+00	1.76E+02
IPCC AR5 GWP excl. bio	1.21E+02	6.22E+01	7.62E+00	5.10E+01

Softwood Plywood

According to ISO 14025
and ISO 21930:2017

IMPACT CATEGORY	TOTAL	A1	A2	A3
[kg CO ₂ e]				
GWP TRACExcl. [kg CO ₂ e]	1.20E+02	6.16E+01	7.57E+00	5.05E+01
AP [kg SO ₂ e]	1.06E+00	4.85E+01	5.02E+02	5.20E+01
EP [kg N eq]	2.92E+01	9.79E+02	3.92E+03	1.90E+01
ODP [kg CFC eq]	4.86E+05	4.07E+06	1.44E+07	4.44E+05
SFP [kg O ₃ eq]	2.21E+01	9.18E+00	1.35E+00	1.16E+01

Resource Use Parameters

RPRE [MJ]	1.40E+02	8.13E+00	3.24E+01	1.32E+02
RPRM [MJ]	1.69E+04	1.64E+04	8.05E+02	4.96E+02
NRPRE [MJ]	1.80E+03	9.28E+02	9.75E+01	7.71E+02
NRPRM [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SM [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m ³]	2.43E+00	2.17E+00	3.49E+03	2.66E+01
ADPF [MJ]	1.69E+03	8.95E+02	9.56E+01	6.94E+02

Waste Parameters and Output Flows

HWD [kg]	1.98E+01	1.70E+01	3.33E+03	2.43E+02
NHWD [kg]	2.30E+01	4.63E+00	1.65E+01	1.82E+01
HLRW [kg]	5.97E+08	1.93E+08	1.03E+09	3.94E+08
ILLRW [kg]	4.54E+07	1.08E+07	4.94E+09	3.41E+07
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 [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

IMPACT CATEGORY	TOTAL	A1	A2	A3
Biogenic Carbon Indicators				
BCRP [kg CO ₂]	-1.20E+03	-1.20E+03	0.00E+00	0.00E+00
BCEP [kg CO ₂]	5.53E+02	0.00E+00	0.00E+00	5.53E+02
BCRK [kg CO ₂]	-5.70E+01	0.00E+00	0.00E+00	-5.70E+01
BCEK [kg CO ₂]	5.70E+01	0.00E+00	0.00E+00	5.70E+01
BCEW [kg CO ₂]	2.56E+02	0.00E+00	0.00E+00	2.56E+02
CCE [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CCR [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CWNR [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

A dominance analysis was performed to show which of the life cycle modules contribute most to the environmental impacts.

Figure 2 Dominance analysis for 1 cubic meter of softwood plywood product (weighted average).

The results are primarily driven by manufacturing and upstream production of

indicators. The upstream raw material impact category is driven mostly by the manufacturing impacts are driven primarily by the energy required for-manufacturing generated steam. From the GWP indicator, 20.7% of the impacts are driven by veneer, by logs, and 8.4% of the results are driven by resin making upstream Raw Materials Production category. 20.5% of the total GWP impacts are driven by purchased are driven-generated steam making up majority of the impacts for manufacturing.

Throughout this report, value choices and judgments that may have affected the decisions are summarized below:

- The inclusion of overhead energy data was determined appropriate due to isolate manufacturing energy from overhead energy.
- The use and selection of secondary datasets of which generic dataset to use aspect of a supply chain is a significant value choice. Collaboration between manufacturer, and data experts was invaluable in determining the best. However, no generic data can be a perfect substitute for specific data and supply have the accuracy of results, however budgetary and time constraints also must be

Some limitations to the study have been identified as follows:

- The availability of geographically more accurate datasets would have improved
- Only known and quantifiable environmental impacts are considered.
- Due to the assumptions and value choices listed-life cycle scenarios and other cannot assess actual and exact impacts, but only potential environmental

References

1. Life Cycle Assessment, ISO 14040 and ISO 14044, 2006.
2. ISO 14044: 2006 Environmental Management Systems – Requirements and Guidelines.
3. ISO 14044: 2006/ Amd 1:2017 Environmental Management Systems – Requirements and Guidelines Amendment 1.
4. ISO 14044: 2006/ Amd 2:2020 Environmental Management Systems – Requirements and Guidelines Amendment 2.
5. ISO 14025: 2006 Environmental labels and declarations – Principles and Procedures.
6. ISO 21930: 2017 Sustainability in buildings – One cycle for environmental declarations of construction products and services.
7. TRACI: The Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts, User Guide <https://nepis.epa.gov/Adobe/PDF/P100HN53.pdf>
8. NSF Product Category Rule for Environmental Product Declarations: PCR for Building Products, 2017, 2018.
9. UL Environment Part A: Product Category Rules for Building Services Life Cycle Assessment Calculation Rules and Report Requirements, v3.2.
10. UL Environment Part B: Product Category Rules for Building Services Structural and Architectural Wood Products, v3.2 Requirements UL 10010
11. UL Environment Program Operator Rules v2.7 March 2022