

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025 AND ISO 21930:2017

SmartEPD-2024-046-0208-01

CertainTeed Veneered Ceiling & Wall Panels, Veneered Linear & Grille Products, and Solid Wood Linear & Grille Products



Date of Issue:
Nov 14, 2024

Expiration:
Nov 14, 2029

Last updated:
Nov 14, 2024





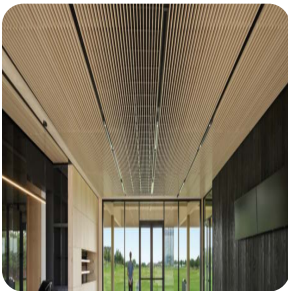
General Information

CertainTeed

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Product Name:	CertainTeed Veneered Ceiling & Wall Panels, Veneered Linear & Grille Products, and Solid Wood Linear & Grille Products
Functional Unit:	0.093 m2 installed product
Declaration Number:	SmartEPD-2024-046-0208-01
Date of Issue:	November 14, 2024
Expiration:	November 14, 2029
Last updated:	November 14, 2024
EPD Scope:	Cradle to gate with other options A1 - A3, A4, A5, C1 - C4
Market(s) of Applicability:	North America

Reference Standards

Standard(s):	ISO 14025 and ISO 21930:2017
Core PCR:	UL Part A PCR for Building-Related Products and Services v.4 Date of issue: March 01, 2022
Sub-category PCR:	UL Part B: Non-Metal Ceiling and Interior Wall Panels Date of issue: April 13, 2021 Valid until: April 13, 2026
Sub-category PCR review panel:	Contact Smart EPD for more information.
General Program Instructions:	Smart EPD General Program Instructions v.1.0, November 2022

Verification Information

LCA Author/Creator:	Saint-Gobain North American ESG Sustainability Group sustainability@saint-gobain.com
EPD Program Operator:	Smart EPD info@smartepd.com www.smartepd.com 585 Grove St., Ste. 145 PMB 966, Herndon, VA 20170, USA

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Verification:

Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071 :

External

🌐 Sevda Alanya Rosenbaum | ✉ sevda.rosenbaum@beath.us

Independent external verification of EPD, according to ISO 14025 and reference PCR(s) :

External

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Limitations, Liability, and Ownership

Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the whole building life cycle. EPD comparability is only possible when all stages of a life cycle have been considered. However, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared. The EPD owner has sole ownership, liability, and responsibility for the EPD.

Organization Information

CertainTeed Corporation, a subsidiary of Saint-Gobain, is a leading North American manufacturer of interior building materials including gypsum, ceilings, and insulation as well as exterior building materials which include roofing, vinyl siding, trim, and water protection.

Further information can be found at: [saint-gobain-northamerica.com](https://www.saint-gobain-northamerica.com)

Product Description

This study investigates three distinct product categories that share similar production and formulation processes. Veneered Ceiling & Wall Panels, Veneered Linear & Grille Products, and Solid Wood Linear & Grille Products are all fabricated at CertainTeed's Strongsville, OH plant. Veneered Ceiling & Wall Panels are available in a variety of ceiling and wall installation methods and sizes. These panels provide many options for ceilings and walls, along with a wide variety of veneer species, cuts, and finishes. There are additional custom and fully engineered options available, including shapes, sizes, suspension and mounting systems, design returns and trims, and finishing options, for design flexibility. Many veneered panels achieve a noise reduction coefficient of up to 0.85 NRC and are manufactured with low-emitting and sustainable materials and components.

Grille Modules (Veneered Linear & Grille Products, and Solid Wood Linear & Grille Products) offer a dimensional, linear design that complements various design elements, installation requirements, and acoustic performance. These modules provide flexibility with multiple blade heights and widths, as well as a range of natural solid woods, veneers, finishes, configurations, and installation methods. The products consist of wood boards, slats, planks, or baffles that are panelized to facilitate installation. CertainTeed Wood Grille Modules come in a variety of standard and custom configurations to complement design elements, installation requirements, and acoustic performance, with a wide array of solid wood and veneer species, cuts, and finishes. Select installation options allow for fully-accessible installation in both ceiling and wall applications. These modules can achieve a noise reduction coefficient of up to 1.15 NRC and are manufactured with low emitting and sustainable materials and components.

Further information can be found at: <https://www.certainteed.com/products/ceiling-wall-systems-products/grille-modules>

Product Information

Functional Unit: 0.093 m2 installed product

Mass: 3.97 kg



Product Specificity: ✗ Product Average ✓ Product Specific

Plants

 CertainTeed Architectural
16065 Imperial Pkwy, Strongsville, OH 44149, USA

Product Specifications

Product Classification Codes: EC3 - Finishes -> CeilingPanel -> AcousticalCeilings

Sound absorption coefficient (NRC) (ASTM C423): 115

Light reflectance (ASTM E1477): 40 %

Declared thickness: 9.56 cm

Surface weight per declared unit: 42.72 kg/m2

Density per declared unit: 448.50 kg/m3

Material Composition

Material/Component Category	Origin	% Mass
Medium-Density Fiberboard	US	82-94
Solid Wood	US	81-83
Plywood	US	11-13
Edge Banding	US	0.2-0.6
Edge Banding Adhesive	US	0.2-0.5
UV Topcoat	US	0.8-3
Acoustic Backing	US	3-4
Solid Wood Dowel	US	2.5-3.5
Stain	US	0.2-0.8



Packaging Material	Origin	kg Mass
Shrink Wrap	US	0.0108 - 0.0132
Foam Board 1/2"	US	0.000361 - 0.0017
Foam Board 1"	US	0.000932 - 0.00447
Cardboard Sheet	US	0.00108 - 0.0493
Oriented Strand Board(OSB)	US	0.00804 - 0.549
2' x 4" x 8' Plywood Board	US	0.0256 - 0.122
Wood Pallets	US	0.0387 - 0.194

Biogenic Carbon Content	kg C per m2
Biogenic carbon content in product	1.72
Biogenic carbon content in accompanying packaging	0.11

Hazardous Materials
No hazardous substances in this product.

EPD Data Specificity

- Primary Data Year:2023
- Manufacturing Specificity:

✗

 Industry Average

✓

 Manufacturer Average

✓

 Facility Specific

Averaging:
Averaging was not conducted for this EPD.

Software and LCI Data Sources

- LCA Software:

📄

 GaBi v. 10.0
- LCI Foreground Database(s):

📄

 GaBi Professional Database v. 2022
- LCI Background Database(s):

📄

 Ecoinvent v. 3.9.1

📄

 GaBi Extension database XVIII: NREL USLCI Integrated v. 2022

📄

 US LCI v. FY21.Q3.01

Renewable Electricity

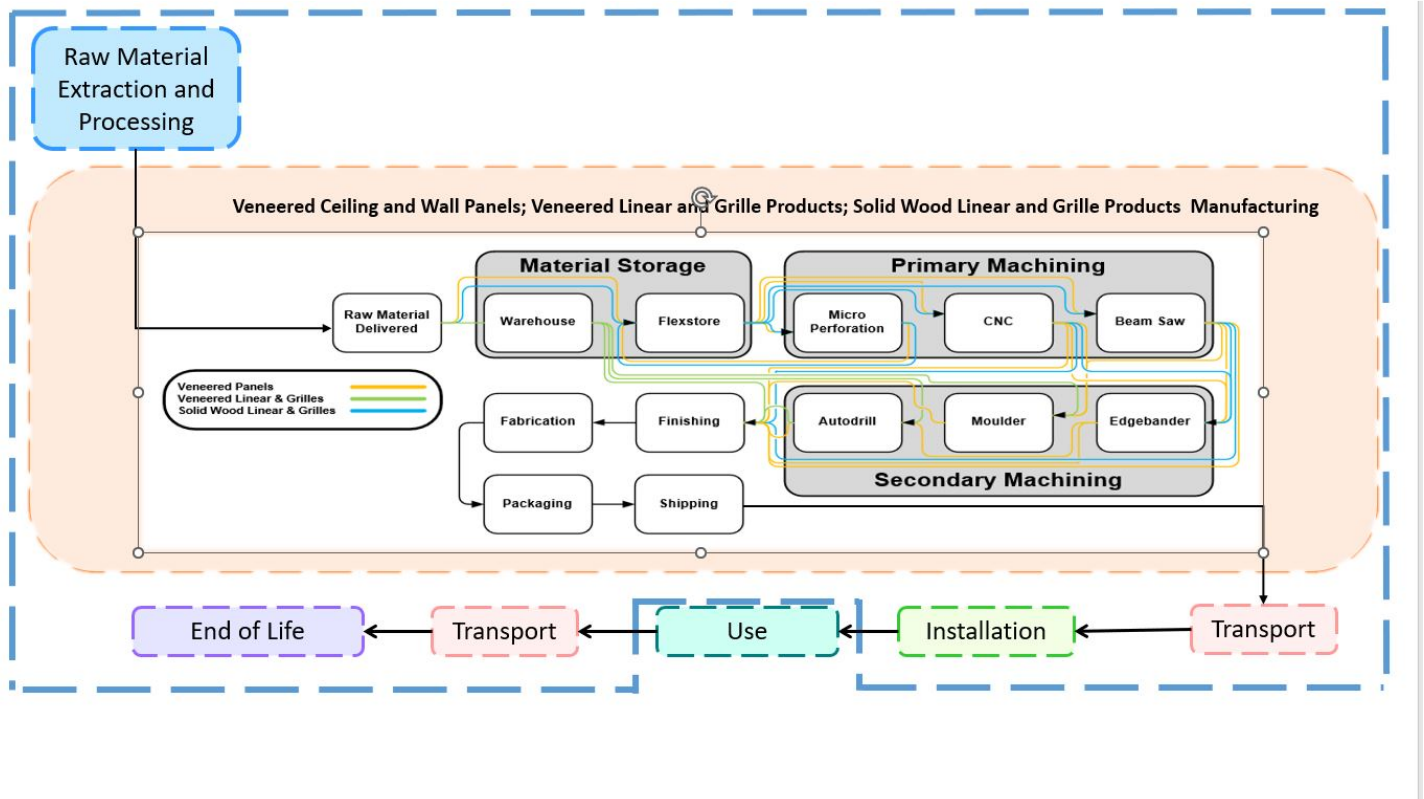
Energy Attribute Certificates (EACs) such as Renewable Energy Certificates (RECs) or Power Purchase Agreements (PPAs) are included in the baseline reported results:

No

System Boundary

Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	✓
	A5	Assembly / Install	✓
Use	B1	Use	ND
	B2	Maintenance	ND
	B3	Repair	ND
	B4	Replacement	ND
	B5	Refurbishment	ND
	B6	Operational Energy Use	ND
	B7	Operational Water Use	ND
End of Life	C1	Deconstruction	✓
	C2	Transport	✓
	C3	Waste Processing	✓
	C4	Disposal	✓
Benefits & Loads Beyond System Boundary	D	Recycling, Reuse Recovery Potential	ND

Product Flow Diagram



Life Cycle Module Descriptions

This EPD study is characterized as a “cradle-to-gate with options” study, examining the Veneered Ceiling & Wall Panels, Veneered Linear & Grille Products, and Solid Wood Linear & Grille Products. The production stage encompasses a range of processes, including the extraction and processing of raw materials, the processing of secondary materials, the transportation of raw materials to the manufacturing site, manufacturing and processing, the consumption of materials, energy, and water, the waste and loss rate during the installation of the product in the building, and the disposal of the product at the end of its life. The final stage of the product's life cycle involves deconstruction, transportation to waste processing, waste processing, and disposal. Each of these stages is closely monitored and optimized to ensure maximum efficiency and sustainability.

- Raw Material Transportation (Module A2)

Raw materials are transported to the manufacturing sites by standard freight truck, train, or ocean freighters. Unless otherwise noted, transport vehicles are fueled with diesel fuel.

- Manufacturing Process Overview (Module A3)

A detailed analysis of the ceiling tile manufacturing process was completed by the Saint-Gobain North American Environmental, Social and Governance (ESG) department to observe and understand the manufacturing processes for Veneered Ceiling & Wall Panels, Veneered Linear & Grille Products, and Solid Wood Linear & Grille Products manufacture. A process flow diagram is attached above and illustrates all process steps, inputs, and outputs including material, energy, emissions, and wastes. At the Strongsville, OH facility, the processing for Veneered Ceiling & Wall Panels, Veneered Linear & Grille Products, and Solid Wood Linear & Grille Products ceiling panels products is the same. When the primary raw materials, Veneered MDF, and solid wood are received from external vendors, large panels are broken down to size and can have features, perforations, slots, and edge details added. Then, parts of the grille or panelized linear products are assembled into units, additionally, backing material are applied to panels and planks. The panels are then packaged into crates or wrapped on pallets, depending on the material and delivery type and shipped.

- Packaging (Module A3)

Packaging of the final product after production is included in the life cycle assessment. The product is stacked in cardboard sleeves, wrapped in shrink wrap, and paper labels affixed. The packages of product in cardboard sleeves are then stacked on a pallet with other finished product and wrapped in shrink wrap again before final

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shipping. The purchased amount of packaging material was provided by the Strongsville facility personnel and the weight of each material per square foot of finished product was calculated.

- Product Distribution (Module A4)

Final products are transported on trucks throughout the United States and Canada. This study assumed an average of 800 km for the final shipment of product based on the assumption within the Product Category Rule (PCR).

- Installation (Module A5)

Installation of CertainTeed products is accomplished by manual labor and typically does not require any additional materials. If necessary, cutting is done by hand using hand held cutting tools.

- Use (Modules B1-B7)

The use phase is excluded from the study. The associated results tables will be excluded from the Scenarios Section.

- End of Life (Module C1-C4)

The end-of-life phase for the ceiling and wall panels was included in the study. End-of-life impacts include landfill disposal of ceiling/ wall panels, scrap, and packaging at the end of installation.

LCA Discussion

Allocation Procedure

Allocation was conducted based on the production mass data provided by the facility as a percentage of the overall production mass at the Strongsville, OH facility.

Cut-off Procedure

Processes whose total contribution to the final result, with respect to their mass and in relation to all considered impact categories, is less than 1% can be neglected. The sum of the neglected processes may not exceed 5% by mass of the considered impact categories. For that a documented assumption is admissible. For Hazardous Substances – as defined by the U.S. Occupational Health and Safety Act the following requirements apply:

- The Life Cycle Inventory (LCI) of hazardous substances will be included, if the inventory is available.
- If the LCI for a hazardous substance is not available, the substance will appear as an input in the LCI of the product, if its mass represents more than 0.1% of the product composition.
- If the LCI of a hazardous substance is approximated by modeling another substance, documentation will be provided.

This EPD is in compliance with the cut-off criteria. No known flows were deliberately excluded. Capital items for the production processes (machines, buildings, etc.) were not taken into consideration.

Data Quality Discussion

Wherever secondary data is used, the study adopts critically reviewed data for consistency, precision, and reproducibility to limit uncertainty. Since the inventory flows for the utilized databases are very often accompanied by a series of data quality ratings, a general indication of precision can be inferred. Using these ratings, the data sets used generally have medium-to-high precision. The Saint-Gobain North American ESG Department collected specific data on energy and material inputs, wastes, water use, emissions, and transportation impacts for the Strongsville, OH manufacturing plant.

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Results

Environmental Impact Assessment Results

IPCC AR5 GWP 100, TRACI 2.1

per 0.093 m2 of product installed product.

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Solid Wood Linear & Grille Products (Standard packaging)

Impact Category	Method	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
GWP-total	IPCC AR5 GWP 100	kg CO2 eq	5.63e-2	2.98e-1	1.97e-1	0	1.31e-2	0	3.85e+0
ODP	TRACI 2.1	kg CFC 11 eq	4.18e-8	1.11e-11	4.05e-14	0	4.87e-13	0	4.08e-15
AP	TRACI 2.1	kg SO2 eq	3.55e-2	1.77e-3	7.28e-4	0	7.74e-5	0	8.66e-3
EP	TRACI 2.1	kg N eq	9.30e-3	9.80e-5	2.56e-4	0	4.29e-6	0	3.09e-3
POCP	TRACI 2.1	kg O3 eq	1.30e-2	4.50e-5	1.06e-5	0	1.97e-6	0	1.25e-4
ADP-fossil	TRACI 2.1	MJ	1.62e+1	5.21e-1	1.65e-2	0	2.28e-2	0	1.67e-1
GWP-fossil	IPCC AR5 GWP 100	kg CO2 eq	1.31e+1	2.98e-1	1.61e-1	0	1.31e-2	0	1.86e+0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particulate Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.

This section presents an exposition of the environmental impact potentials for the Solid Wood Linear & Grille Products families that are packaged in soft packaging and are manufactured at the Strongsville, OH facility. The results are delineated for different stages of the product's lifecycle, including raw material sourcing (A1), transportation of raw materials (A2), manufacturing (including packaging) (A3), shipping of the final product (A4), installation (A5), and end-of-life (C2 and C4). It is important to highlight that stages C1 and C3 of the end-of-life process are presumed to carry no burden, resulting in a presentation of 0 for these stages. The total Global Warming Potential (GWP) includes biogenic content.

The data in the table represents the environmental impact per 0.093m2 (1ft2) of installed ceiling panel, with an estimated service life of 30 years. The results are indicative of the overall impact potentials of the Theatre Black Ceiling Panel Product families at the Strongsville, OH.

Veneered Linear & Grille Products ((Standard packaging))

Impact Category	Method	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
GWP-total	IPCC AR5 GWP 100	kg CO2 eq	-1.45e+0	3.52e-1	2.42e-1	0	1.54e-2	0	7.10e+0
ODP	TRACI 2.1	kg CFC 11 eq	1.49e+1	6.14e-1	2.01e-2	0	2.68e-2	0	1.97e-1
AP	TRACI 2.1	kg SO2 eq	2.71e-2	2.08e-3	8.85e-4	0	9.12e-5	0	1.02e-2
EP	TRACI 2.1	kg N eq	9.09e-3	1.15e-4	3.10e-4	0	5.05e-6	0	3.64e-3
POCP	TRACI 2.1	kg O3 eq	5.48e-3	5.30e-5	1.29e-5	0	2.32e-6	0	1.47e-4
ADP-fossil	TRACI 2.1	MJ	1.49e+1	6.14e-1	2.01e-2	0	2.68e-2	0	1.97e-1
GWP-fossil	IPCC AR5 GWP 100	kg CO2 eq	1.24e+1	3.52e-1	1.96e-1	0	1.54e-2	0	2.19e+0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particulate Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.

This section presents an exposition of the environmental impact potentials for the Veneered Linear & Grille Products families that are packaged in soft packaging and are manufactured at the Strongsville, OH facility. The results are delineated for different stages of the product's lifecycle, including raw material sourcing (A1), transportation of raw materials (A2), manufacturing (including packaging) (A3), shipping of the final product (A4), installation (A5), and end-of-life (C2 and C4). It is important to highlight that stages C1 and C3 of the end-of-life process are presumed to carry no burden, resulting in a presentation of 0 for these stages. The total Global Warming Potential (GWP) includes biogenic content.

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per 0.093 m2 of product installed product.

Veneered Ceiling & Wall Panels

Impact Category	Method	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
GWP-total	IPCC AR5 GWP 100	kg CO2 eq	8.06e-1	9.59e-2	5.30e-2	0	4.20e-3	0	1.94e+0
ODP	TRACI 2.1	kg CFC 11 eq	4.24e-9	3.58e-12	1.14e-14	0	1.57e-13	0	1.31e-15
AP	TRACI 2.1	kg SO2 eq	1.00e-2	5.68e-4	2.04e-4	0	2.49e-5	0	2.78e-3
EP	TRACI 2.1	kg N eq	1.48e-3	3.15e-5	7.18e-5	0	1.38e-6	0	9.93e-4
POCP	TRACI 2.1	kg O3 eq	7.27e-4	1.45e-5	2.96e-6	0	6.32e-7	0	4.01e-5
ADP-fossil	TRACI 2.1	MJ	3.93e+0	1.67e-1	4.49e-3	0	7.32e-3	0	5.37e-2
GWP-fossil	IPCC AR5 GWP 100	kg CO2 eq	3.29e+0	9.59e-2	4.41e-2	0	4.20e-3	0	5.98e-1

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particulate Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.

This section presents an exposition of the environmental impact potentials for the Veneered Ceiling & Wall Panel Products families that are packaged in soft packaging and are manufactured at the Strongsville, OH facility. The results are delineated for different stages of the product's lifecycle, including raw material sourcing (A1), transportation of raw materials (A2), manufacturing (including packaging) (A3), shipping of the final product (A4), installation (A5), and end-of-life (C2 and C4). It is important to highlight that stages C1 and C3 of the end-of-life process are presumed to carry no burden, resulting in a presentation of 0 for these stages. The total Global Warming Potential (GWP) includes biogenic content.

Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted. Any comparison of EPDs shall be subject to the requirements of ISO 21930 or EN 15804. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparison can be inaccurate, and could lead to erroneous selection of materials or products which are higher-impact, at least in some impact categories.

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Resource Use Indicators

per 0.093 m2 of product installed product.

Solid Wood Linear & Grille Products (Standard packaging)

Indicator	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
RPRE	MJ, net calorific value	2.40e+2	0	1.42e-2	0	0	0	1.56e-1
RPRM	MJ, net calorific value	1.23e+2	0	0	0	0	0	0
RPRT	MJ, net calorific value	3.63e+2	0	1.42e-2	0	0	0	1.56e-1
NRPRE	MJ, net calorific value	2.14e+2	3.79e+0	1.38e-1	0	1.66e-1	0	1.33e+0
NRPRM	MJ, net calorific value	0	0	0	0	0	0	0
NRPRT	MJ, net calorific value	2.14e+2	3.79e+0	1.38e-1	0	1.66e-1	0	1.33e+0
SM	kg	0	0	0	0	0	0	0
RSF	MJ, net calorific value	0	0	0	0	0	0	0
NRSF	MJ, net calorific value	0	0	0	0	0	0	0
RE	MJ	0	0	0	0	0	0	0
FW	m3	6.70e-2	0	7.52e-5	0	0	0	3.59e-4

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRM or PENRM = Total non-renewable primary resources with energy content, SM = Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

per 0.093 m2 of product installed product.

Veneered Linear & Grille Products (Standard packaging)

Indicator	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
RPRE	MJ, net calorific value	1.47e+2	0	1.65e-2	0	0	0	1.83e-1
RPRM	MJ, net calorific value	7.23e+1	0	0	0	0	0	ND
RPRT	MJ, net calorific value	7.23e+1	0	1.65e-2	0	0	0	1.83e-1
NRPRE	MJ, net calorific value	2.06e+2	4.47e+0	1.60e-1	0	1.95e-1	0	1.57e+0
NRPRM	MJ, net calorific value	0	0	0	0	0	0	0
NRPRT	MJ, net calorific value	2.06e+2	4.47e+0	1.60e-1	0	1.95e-1	0	1.57e+0
SM	kg	0	0	0	0	0	0	0
RSF	MJ, net calorific value	0	0	0	0	0	0	0
NRSF	MJ, net calorific value	0	0	0	0	0	0	0
RE	MJ	0	0	0	0	0	0	0
FW	m3	6.03e-2	0	8.45e-5	0	0	0	4.23e-4

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRM or PENRM = Total non-renewable primary resources with energy content, SM = Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

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CertainTeed



per 0.093 m2 of product installed product.

Veneered Ceiling & Wall Panels

Indicator	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
RPRE	MJ, net calorific value	8.59e+0	0	3.68e-3	0	0	0	5.00e-2
RPRM	MJ, net calorific value	1.81e+1	0	0	0	0	0	0
RPRT	MJ, net calorific value	2.67e+1	0	3.68e-3	0	0	0	5.00e-2
NRPRE	MJ, net calorific value	5.56e+1	1.22e+0	3.54e-2	0	5.33e-2	0	4.27e-1
NRPRM	MJ, net calorific value	0	0	0	0	0	0	0
NRPRT	MJ, net calorific value	5.56e+1	1.22e+0	3.54e-2	0	5.33e-2	0	4.27e-1
SM	kg	0	0	0	0	0	0	0
RSF	MJ, net calorific value	0	0	0	0	0	0	0
NRSF	MJ, net calorific value	0	0	0	0	0	0	0
RE	MJ	0	0	0	0	0	0	0
FW	m3	1.24e-2	0	1.18e-5	0	0	0	1.15e-4

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRT or PENRT = Total non-renewable primary resources with energy content, SM = Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

Waste and Output Flow Indicators

per 0.093 m2 of product installed product.

Solid Wood Linear & Grille Products (Standard packaging)

Indicator	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
HWD	kg	4.26e-10	0	3.23e-12	0	0	0	3.31e-11
NHWD	kg	4.03e-1	0	3.00e-1	0	0	0	3.45e+0
HLRW	kg	1.99e-5	0	1.74e-9	0	0	0	1.64e-8
ILLRW	kg	1.67e-2	0	1.54e-6	0	0	0	1.47e-5

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.

CertainTeed Veneered Ceiling & Wall Panels, Veneered Linear & Grille Products, and Solid Wood Linear & Grille Products

CertainTeed



per 0.093 m2 of product installed product.

Veneered Linear & Grille Products (Standard packaging)

Indicator	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
HWD	kg	6.04e-10	0	3.73e-12	0	0	0	3.90e-11
NHWD	kg	4.36e-1	0	3.48e-1	0	0	0	4.06e+0
HLRW	kg	2.02e-5	0	2.00e-9	0	0	0	1.94e-8
ILLRW	kg	1.69e-2	0	1.77e-6	0	0	0	1.73e-5

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.

per 0.093 m2 of product installed product.

Veneered Ceiling & Wall Panels

Indicator	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
HWD	kg	2.13e-10	0	7.98e-13	0	0	0	1.06e-11
NHWD	kg	1.47e-1	0	8.02e-2	0	0	0	1.11e+0
HLRW	kg	1.42e-3	0	0	0	0	0	0
HLRW	kg	5.74e-6	0	4.07e-10	0	0	0	5.28e-9

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.

Carbon Emissions and Removals

per 0.093 m2 of product installed product.

Solid Wood Linear & Grille Products (Standard packaging)

Indicator	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
BCRP	kg CO2	-6.31e+0	ND	ND	ND	ND	ND	ND
BCEP	kg CO2	ND	ND	ND	ND	ND	ND	6.31e+0
BCRK	kg CO2	-3.98e-1	ND	ND	ND	ND	ND	ND
BCEK	kg CO2	ND	ND	3.98e-1	ND	ND	ND	ND
BCEW	kg CO2	ND	ND	ND	ND	ND	ND	ND
CCE	kg CO2	ND	ND	ND	ND	ND	ND	ND
CCR	kg CO2	ND	ND	ND	ND	ND	ND	ND
CWNR	kg CO2	ND	ND	ND	ND	ND	ND	ND

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

BCRP = Biogenic Carbon Removal from Product, BCEP = Biogenic Carbon Emission from Product, BCRK = Biogenic Carbon Removal from Packaging, BCEK = Biogenic Carbon Emission from Packaging, BCEW = Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes, CCE = Calcination Carbon Emissions, CCR = Carbonation Carbon Removals, CWNR = Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes, GWP-luc = Carbon Emissions from Land-use Change.

CertainTeed Veneered Ceiling & Wall Panels, Veneered Linear & Grille Products, and Solid Wood Linear & Grille Products

CertainTeed



per 0.093 m2 of product installed product.

Veneered Linear & Grille Products (Standard packaging)

Indicator	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
BCRP	kg CO2	-8.30e+0	ND	ND	ND	ND	ND	ND
BCEP	kg CO2	ND	ND	ND	ND	ND	ND	8.30e+0
BCRK	kg CO2	-4.36e-1	ND	ND	ND	ND	ND	ND
BCEK	kg CO2	ND	ND	4.36e-1	ND	ND	ND	ND
BCEW	kg CO2	ND	ND	ND	ND	ND	ND	ND
CCE	kg CO2	ND	ND	ND	ND	ND	ND	ND
CCR	kg CO2	ND	ND	ND	ND	ND	ND	ND
CWNR	kg CO2	ND	ND	ND	ND	ND	ND	ND

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

BCRP = Biogenic Carbon Removal from Product, BCEP = Biogenic Carbon Emission from Product, BCRK = Biogenic Carbon Removal from Packaging, BCEK = Biogenic Carbon Emission from Packaging, BCEW = Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes, CCE = Calcination Carbon Emissions, CCR = Carbonation Carbon Removals, CWNR = Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes, GWP-luc = Carbon Emissions from Land-use Change.

per 0.093 m2 of product installed product.

Veneered Ceiling & Wall Panels

Indicator	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
BCRP	kg CO2	-2.17e+0	ND	ND	ND	ND	ND	ND
BCEP	kg CO2	ND	ND	ND	ND	ND	ND	2.17e+0
BCRK	kg CO2	-1.49e-1	ND	ND	ND	ND	ND	ND
BCEK	kg CO2	ND	ND	1.49e-1	ND	ND	ND	ND
BCEW	kg CO2	ND	ND	ND	ND	ND	ND	ND
CCE	kg CO2	ND	ND	ND	ND	ND	ND	ND
CCR	kg CO2	ND	ND	ND	ND	ND	ND	ND
CWNR	kg CO2	ND	ND	ND	ND	ND	ND	ND

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

BCRP = Biogenic Carbon Removal from Product, BCEP = Biogenic Carbon Emission from Product, BCRK = Biogenic Carbon Removal from Packaging, BCEK = Biogenic Carbon Emission from Packaging, BCEW = Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes, CCE = Calcination Carbon Emissions, CCR = Carbonation Carbon Removals, CWNR = Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes, GWP-luc = Carbon Emissions from Land-use Change.

Impact Scaling Factors

Product Name and/or Product Attribute	Product Specific Functional/Declared Unit Multiplier
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Scenarios

Transport to the building/construction site (A4)

A4 Module

Fuel Type:	Diesel
Liters of Fuel:	30 l/100km
Vehicle Type:	Standard Freight Trailer
Transport Distance:	800 km
Capacity Utilization:	85 %
Packaging Mass:	0.38 kg
Gross density of products transported:	448.5 kg/m ³
Capacity utilization volume factor:	>1
Assumptions for scenario development:	Final products are transported on trucks throughout the United States. This study assumed an average of 800 km for the final shipment of product based on the assumption within the PCR.

Installation in to the building/construction site (A5)

A5 Module

Installation Scrap Rate Assumed:	7 %
Product Lost per Functional Unit:	0.28 kg
Mass of Packaging Waste Specified by Type:	0.38 kg
Biogenic Carbon Contained in Packaging:	0.11 kg
Assumptions for scenario development:	Ceiling panels use a suspended grid system to hold them in place. This study covers the ceiling panels only and does not include the grid system. Ceiling panels are installed manually by maneuvering and tilting the panels above the ceiling grid, then carefully resting the panels on the grid. Panels for borders are cut to size before installation with a handheld cutting tool. As required by the PCR, this study assumes a 7% scrap rate from installation of the product. In addition, disposal of the packaging material is included in the installation phase

End of Life

C1 - C4 Modules

Recovery

Landfill:	3.97 kg
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Disposal

Product or Material for Final Disposal:	3.97 kg
Removals of Biogenic Carbon:	6.31 kg CO ₂

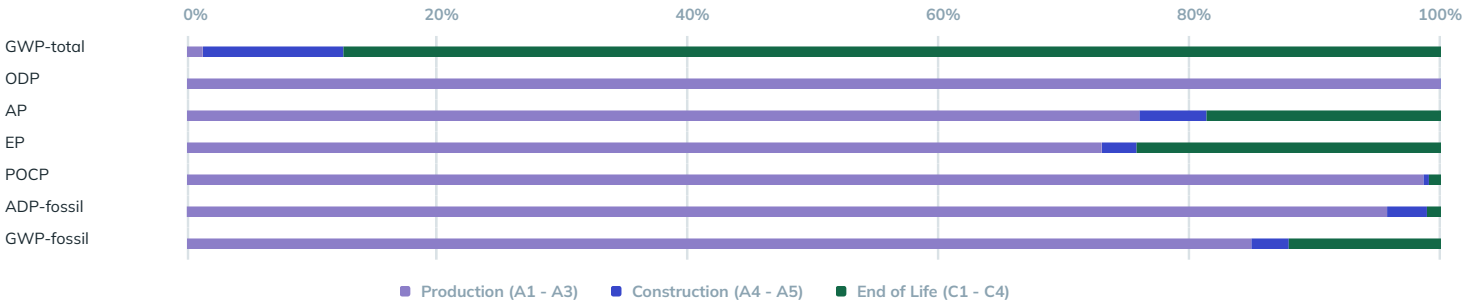


Assumptions for scenario development:

This study assumes a product service life of 30 years. The selected service life used in this study reflects the expert opinion of the product manufacturer and the building service life indicated in the PCR. Similarly, to the installation of the ceiling panels, deconstruction (module C1) is also assumed to be manually completed. Therefore, the study assumes the deconstruction module to be burden free. The product's end-of-life is assumed to be inert in a landfill. At this time there are no recycling scenarios for the Veneered Ceiling & Wall Panels, Veneered Linear & Grille Products, and Solid Wood Linear & Grille Products at the end of its service life, so the waste processing module (C3) of the end-of-life stage is also assumed to be burden free. There is no industry consensus for end-of-life scenarios, per the PCR guidance. For this reason, the study will assume landfill disposal at end of life.

Interpretation

The data pertaining to the operation of the Strongsville, OH facility, were directly obtained from CertainTeed Corporation. The data were meticulously scrutinized for internal consistency, and cross-verified with plant personnel. The researchers recommend sub-metering of energy use for each critical stage in the manufacturing process to allow for a more detailed analysis. It is important to note that the findings of this research are limited by the inherent uncertainty of creating a representative model through Life Cycle Assessment (LCA). The modeling of the product system involved numerous assumptions, including representative processes and datasets. While quality control measures were implemented at each step of building the Life Cycle Inventory (LCI) and conducting the Life Cycle Impact Assessment (LCIA), the results are inevitably subject to uncertainty since the data represents only one year of manufacturing information from Strongsville, OH . A detailed evaluation of more time periods would serve to reduce this uncertainty. Manufacturing contributes more than 50% to the overall global warming potential (IPCC AR5, Excluding biogenic). In terms of raw material impacts, stain and MDF account for 42% and 26% of the total raw material global warming potential (IPCC AR5, Excluding biogenic) impacts for veneer panels, respectively. For Veneer Grille and Linear Systems, MDF contributes 30% to the raw material global warming potential (IPCC AR5, Excluding biogenic), and for Solid Wood Grille and Linear Systems, 87% of the raw material global warming (IPCC AR5, Excluding biogenic) impact stems from solid wood. Incorporating more recycled content into the products could help reduce the environmental impacts associated with raw materials. Increasing energy efficiency at the Strongsville, OH manufacturing facility could help to reduce the overall environmental impacts for all product groupings. Furthermore, identifying alternate uses or recycling options for the product at the end of its life will reduce end-of-life impacts and potential raw materials burdens of recycled products. The results also suggest a strong link between product mass and embodied emissions, with heavier or larger products having higher emissions. Lightweighting the product (using less mass per functional unit) would reduce the impact of the product.



Additional Environmental Information

- Environment and Health During Manufacturing
CertainTeed has well-established Environmental, Health, and Safety (EHS) and product stewardship programs which help to enforce proper evaluation and monitoring of chemicals that are chosen to manufacture products. These programs ensure that all environmental and OSHA requirements are met or exceeded to ensure the health and safety of all employees and contractors.
- Environment and Health During Installation
All recommendations should be utilized as indicated by Safety Data Sheets and installation guidelines. This information can be downloaded at: <https://www.certainteed.com>

CertainTeed Veneered Ceiling & Wall Panels, Veneered Linear & Grille Products, and Solid Wood Linear & Grille Products

CertainTeed



com/. Drilling, sawing, sanding or machining wood products can expose you to wood dust, a substance known to the California to cause cancer. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection. For more information go to www.P65Warnings.ca.gov/wood.

Veneered Linear Planks, Grille Blades, and Panels:

- ASTM E84 (Class A) and CAN/ULC-S102
- Flame Spread: 25 or less
- Smoke Developed: 50 or less

Solid Wood Linear Planks & Grille Blades:

- ASTM E84 (Class C) and CAN/ULC-S102
- Flame Spread: 200 or less
- Smoke Developed: 150 or less
- California Department of Public Health CDPH/EHLB/Standard Method Version 1.2, 2017 (CA Specification 01350) School Classroom and Private Office compliant for Wallcoverings or Ceilings.
- Water: This product is subject to water damage. No water or water vapor from sources including, but not limited to, condensation, leaking pipes and/or ducts, or live steam should come in contact with the ceiling panels.
- Mechanical Destruction: This product is intended for commercial applications. Use and practice information can be found in "Acoustical Ceilings: Use and Practice" published by Ceilings & Interior Systems Construction Association (CISCA). This product should be installed in accordance with CertainTeed installation instruction.
- Delayed Emissions: No delayed emissions are expected from this product.

Modified Impact Results: Renewable Electricity

per 0.093 m2 of product installed product.

Impact Category	Indicator	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
GWP-total	ND	kg CO2 eq	-2.66e-1	2.98e-1	1.97e-1	0	1.31e-2	0	2.21e+0
ODP	ND	kg CFC 11 eq	4.18e-8	1.11e-11	4.05e-14	0	4.87e-13	0	4.08e-15
AP	ND	kg SO2 eq	3.51e-2	1.77e-3	7.28e-4	0	7.74e-5	0	8.66e-3
EP	ND	kg N eq	9.26e-3	9.80e-5	2.56e-4	0	4.29e-6	0	3.09e-3
POCP	ND	kg O3 eq	1.30e-2	4.50e-5	1.06e-5	0	1.97e-6	0	1.25e-4
ADP-fossil	ND	MJ	1.60e+1	5.21e-1	1.65e-2	0	2.28e-2	0	1.67e-1
GWP-fossil	ND	kg CO2 eq	1.28e+1	2.98e-1	1.61e-1	0	1.31e-2	0	1.86e+0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particular Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.

Saint-Gobain is committed to achieving Carbon Neutrality by 2050. In January 2021, Saint-Gobain North America started receiving renewable energy certificates (RECs) from a 12-year virtual power purchase agreement (vPPA) with the Blooming Grove Wind Farm in McLean County, Illinois. Each year within the agreement, the company receives and retires these RECs, effectively reduced approximately 36% of CO2 emissions from electricity usage in 2022 and 2023 in the United States and Canada. This renewable energy scenario results are for the Solid Wood Linear & Grille Products (Stardand Packaging)

CertainTeed Veneered Ceiling & Wall Panels, Veneered Linear & Grille Products, and Solid Wood Linear & Grille Products

CertainTeed



Further Information

Solid Wood Linear & Grille Products (Crate Packaging)

LCIA Method	Impact Category	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
IPCC AR5 GWP 100	GWP-total	kg CO2 eq	-2.20E+01	2.98e-1	1.97e-1	0	1.31e-2	0	3.85E+00
TRACI 2.1	ODP	kg CFC 11 eq	1.15E-07	1.11e-11	4.05e-14	0	4.87e-13	0	4.08e-15
TRACI 2.1	AP	kg SO2 eq	1.33E-01	1.77e-3	7.28e-4	0	7.74e-5	0	8.66e-3
TRACI 2.1	EP	kg N eq	2.87E-02	9.80e-5	2.56e-4	0	4.29e-6	0	3.09e-3
TRACI 2.1	POCP	kg O3 eq	2.80E-02	4.50e-5	1.06e-5	0	1.97e-6	0	1.25e-4
TRACI 2.1	ADP-fossil	MJ	2.58E+01	5.21e-1	1.65e-2	0	2.28e-2	0	1.67e-1
IPCC AR5 GWP 100	GWP-fossil	kg CO2 eq	1.91E+01	2.98e-1	1.61e-1	0	1.31e-2	0	1.86e+0

Veneered Linear & Grille Products (Crate Packaging)

LCIA Method	Impact Category	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
IPCC AR5 GWP 100	GWP-total	kg CO2 eq	-6.45E+00	3.52E-01	2.42E-01	0	1.54E-02	0	7.10E+00
TRACI 2.1	ODP	kg CFC 11 eq	2.47E+01	6.14E-01	2.01E-02	0	2.68E-02	0	1.97E-01
TRACI 2.1	AP	kg SO2 eq	1.26E-01	2.08E-03	8.85E-04	0	9.12E-05	0	1.02E-02
TRACI 2.1	EP	kg N eq	2.89E-02	1.15E-04	3.10E-04	0	5.05E-06	0	3.64E-03
TRACI 2.1	POCP	kg O3 eq	2.07E-02	5.30E-05	1.29E-05	0	2.32E-06	0	1.47E-04
TRACI 2.1	ADP-fossil	MJ	2.47E+01	6.14E-01	2.01E-02	0	2.68E-02	0	1.97E-01
IPCC AR5 GWP 100	GWP-fossil	kg CO2 eq	1.86E+01	3.52E-01	1.96E-01	0	1.54E-02	0	2.19E+00

References

- Product Category Rules for Building-Related Product and Services: Part A – Life Cycle Assessment Calculation Rules and Report Requirements. Version 3.2. 2022. UL Environment.
- Product Category Rule Guidance for Building-Related Products and Services Part B: Non-Metal Ceiling and Interior Wall Panel EPD Requirements, Version 2.0 2021. UL Environment.
- ISO 1400/14044. (2006). ISO 14044:2006/Amd 1:2017/Amd 2:2020 – Environmental Management - Life cycle assessment – Requirement and guidelines.
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
- Sphera LCA FE Databases. <https://gabi.com/america/>
- US LCI Database. <https://www.nrel.gov/lci/>
- ecoinvent v3.9.1 Database. <http://ecoinvent.org/>
- CertainTeed Ceiling and Walls Website. <https://www.certainteed.com/products/ceiling-wall-systems>
- TRACI Model. <https://www.epa.gov/chemical-research/tool-reduction-and-assessment-chemicals-and-other-environmental-impacts-traci>