

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025 AND ISO 21930:2017

SmartEPD-2024-036-0166-01

CertainTeed Lightweight and Midweight Joint Compound (Calgary)



Date of Issue:
Sep 26, 2024

Expiration:
Sep 26, 2029

Last updated:
Oct 02, 2024

General Information	4
Reference Standards	4
Verification Information	4
Limitations, Liability, and Ownership	5
Organization Information	5
Product Information	5
Plants	6
Product Specifications	6
Material Composition	6
Software and LCI Data Sources	7
EPD Data Specificity	7
Renewable Electricity	8
System Boundary	9
Product Flow Diagram	10
Life Cycle Module Descriptions	10
LCA Discussion	11
Results	12
Environmental Impact Assessment	12
Resource Use Indicators	14
Waste and output Flow Indicators	15
Carbon Emissions and Removals	16
Scenarios	18
Transport to the building/construction site (A4)	18
Installation in to the building/construction site (A5)	18
Reference Service Life (B1)	18
Maintenance (B2)	19



Repair (B3)	19
Replacement (B4)	19
Refurbishment (B5)	19
Operational Energy Use & Operational Water Use	19
End of Life (C1 - C4)	19
Interpretation	20
Additional Environmental Information	20
References	21

General Information

CertainTeed

20 Moores Rd, Malvern, PA 19355

888-233-8990

Sustainability@Saint-Gobain.com certainteed.com



Product Name:	CertainTeed Lightweight and Midweight Joint Compound (Calgary)
Functional Unit:	100 m2
Declaration Number:	SmartEPD-2024-036-0166-01
Date of Issue:	September 26, 2024
Expiration:	September 26, 2029
Last updated:	October 02, 2024
EPD Scope:	Cradle to grave A1 - A3, A4, A5, B1 - B7, C1 - C4
Market(s) of Applicability:	North America

Reference Standards

Standard(s):	ISO 14025 and ISO 21930:2007
Core PCR:	UL Part A PCR for Building-Related Products and Services v.4 Date of issue: March 28, 2022
Sub-category PCR:	UL Part B: Joint Compound v.1 Date of issue: August 03, 2016 Valid until: December 31, 2024
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:	Casper Gate 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

Verification:

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

External

 Jana Fogarty |  TrueNorth Collective |  jana.fogarty@truenorthcollective.net

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

External

 Jana Fogarty |  TrueNorth Collective |  jana.fogarty@truenorthcollective.net

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: <https://www.saint-gobain-northamerica.com/>

Product Description

CertainTeed Joint Compounds are specifically engineered pre-mixed compounds that necessitate minimal mixing or thinning. The Lightweight and Midweight Ready Mix Joint Compound product lines encompass a variety of offerings. The Lightweight options include CertainTeed Lite Finishing, CertainTeed Lite All Purpose, CertainTeed Lite Taping, CertainTeed Lite Topping, CertainTeed Lite Fill and Finish, and CertainTeed Ready-Mix Spray texture. The Midweight options include CertainTeed Easi-Fil Dust Away and CertainTeed Easi-Fil All-Purpose. These products are available in a range of volumes.

This Environmental Product Declaration (EPD) focuses on the average Lightweight and Midweight Joint Compound products manufactured at the CertainTeed Gypsum Calgary, AB facility. The study considers the 17L Carton as the standard volume for all the aforementioned lightweight products, and 12L pail as the standard volume for Midweight products. The Ready Mix Joint Compound products in this EPD are composed of a water and Limestone blend with additional clay, binders, thickeners, preservatives, and other additives. The Lightweight and Midweight Ready Mix Joint Compounds offer the following benefits:

- Premixed vinyl-based compounds deliver a smooth, seamless finish for walls and ceilings that adhere to the ASTM C475 standard.
- The versatile All-purpose compound is suitable for both taping and finishing of wallboard joints, corner trims, and fasteners.
- The strong bond of Taping compound is specifically designed for embedding drywall reinforcing tape.
- The Easy-to-sand Finishing compound is formulated for the final coats over wallboard joints, corner trims, and fastener heads.

Further information can be found at: https://www.certainteed.ca/products/drywall-products-systems-products?product_type=Joint+Compounds%7CTape%7CGlue&zip=074

Product Information

Functional Unit: 100 m2
Mass: 59.29 kg

Reference Service Life:	75 Years
Product Specificity:	✗ Product Average ✓ Product Specific
Variation in GWP Result (Products):	-4% to +4%

Plants

 CertainTeed Calgary Finishing Plant
 3304 58 Ave SE, Calgary, AB T2C 0B3, Canada

Product Specifications

Product Classification Codes:	EC3 - Finishes -> Gypsum Board -> Gypsum Finishing Compounds
Edge and Check Crack Resistance (per ASTM C474):	Pass
Volume Shrinkage Rate (per ASTM C474):	18 %
Microbial Resistance (Putrefaction) (per ASTM C474):	Pass days
Volume:	51.74 liter
Density (wet, per ASTM C474):	1.146 kg/L

Material Composition

Material/Component Category	Origin	% Mass
Water	Canada	28.0 - 37.0
Limestone and Filler	Canada	48.0 - 60.0
Clay	US	2.0 - 8.0
Binders	Canada	2.0 - 4.0
Thickeners	US	1.0 - 2.0
Preservatives	Canada	<1
Other Additives	Canada	< 1

Packaging Material	Origin	kg Mass
Wooden Pallet	Canada	0.0067-0.0095
Cardboard	Canada	1.68
shrink Wrap	Canada	0.0228-0.0323
Plastic Pail	Canada	3.45

Biogenic Carbon Content	kg C per m2
Biogenic carbon content in product	0.301
Biogenic carbon content in accompanying packaging	0.834

Hazardous Materials
No regulated hazardous or dangerous substances are included in this product.

EPD Data Specificity

Primary Data Year:

2022

Manufacturing Specificity:

- ☒ Industry Average
- ☒ Manufacturer Average
- ☒ Facility Specific

Averaging:

The reference data for this LCA is from the CertainTeed Lightweight and Midweight Joint Compound products for the calendar year 01/01/2022 - 12/31/2022. In evaluating the environmental impacts associated with Lightweight and Midweight Joint compound, a production-weighted average was employed. This approach was utilized to comprehensively understand the overall environmental performance. The approach of assigning weights to each product's data based on its production output or contribution to the overall system was adopted. The production-weighted average method considers the varying scales and capacities of the products, ensuring that the environmental impacts are representative of the actual production volumes of each product. This approach provides a more nuanced and realistic assessment, as it acknowledges that products with larger production volumes may have a proportionally more significant influence on the overall environmental footprint. To calculate the production-weighted average, the following steps were taken:

- Comprehensive data on the products' environmental inputs and outputs were gathered, including energy consumption, raw material usage, emissions, and waste generation.
- The production volumes for each product were determined for the specific time period under consideration, measured in units of product output, mass, or any other relevant metric.
- Weights were assigned to each product based on its production volume, with those products with higher production volumes receiving higher weights in the calculation.
- The environmental data for each product were adjusted by multiplying the data values by their respective weights. This adjustment ensures that products with larger production volumes contribute more significantly to the overall assessment.
- Finally, the adjusted environmental data from all products were aggregated to calculate the production-weighted average environmental impact indicators, such as carbon footprint, energy consumption, or other relevant metrics.

By employing a production-weighted average, this LCA approach provides a more accurate representation of the environmental performance of the entire system, considering both the diversity of products and their respective production contributions.

Software and LCI Data Sources

LCA Software:	 GaBi v. 10.0
LCI Foreground Database(s):	 GaBi Professional Database v. 2022
LCI Background Database(s):	 GaBi Extension database XVIII: NREL USLCI Integrated v. 2022  Ecoinvent v. 3.9.1

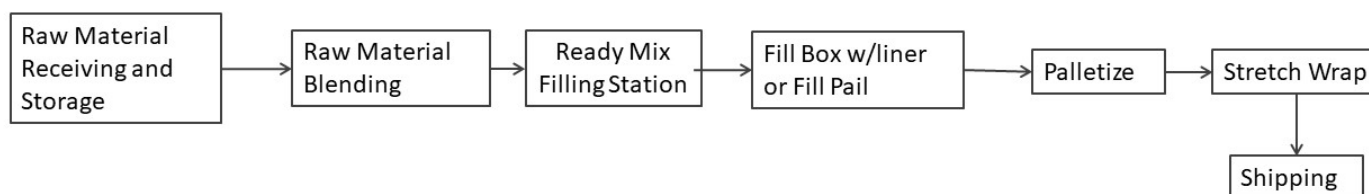
Renewable Electricity

Renewable electricity is used: No

System Boundary

Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	✓
	A5	Assembly / Install	✓
Use	B1	Use	✓
	B2	Maintenance	✓
	B3	Repair	✓
	B4	Replacement	✓
	B5	Refurbishment	✓
	B6	Operational Energy Use	✓
	B7	Operational Water Use	✓
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-grave study, examining the Lightweight, and Midweight Joint Compound product line. 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 Joint Compound manufacturing process was completed by the Saint-Gobain North American Environmental, Social and Governance (ESG) department to observe and understand the manufacturing processes for Joint Compound manufacture. A process flow diagram is attached above and illustrates all process

steps, inputs, and outputs including material, energy, emissions, and wastes. Raw materials are received and stored until processing. Raw materials are then blended according to the product recipe and sent to the Ready Mix Filling Station. If packaged in a box, the box is formed and plastic liner inserted. The blended material is then poured into the box or pail container at the Ready Mix Filling Station. Once filled, the containers are sealed, palletized, and stretch wrapped before shipping

- Packaging (Module A3)

The Lightweight and Midweight Ready Mix Joint Compound products are packaged depending on the volume being sold are packaged using varying sized cardboard boxes with plastic liners, plastic pails, or plastic drums. The products are then stacked on pallets and wrapped in plastic stretch wrap before shipping.

- Product Distribution (Module A4)

This study assumes that CertainTeed Joint compound products are shipped to distribution centers, typically within an average of 310 miles (500 km) of the Calgary Facility. Final products are transported on trucks fully loaded by weight.

- Installation (Module A5)

The CertainTeed Lightweight and Midweight Ready Mix Joint Compound products are installed by hand with hand tools such as a finishing knife, damp sponge, and if necessary light sanding.

- Use (Modules B1-B7)

There are no required product specific calculation rules for the use phase of drywall finishing products. Impacts from the use phase modules of these products are not anticipated and are reported as zero

- End of Life (Module C1-C4)

This product was modeled as being disposed of in a landfill at the end of its life

LCA Discussion

Allocation Procedure

The LCI data was collected from the Calgary, AB manufacturing facility for the production year 2022. In addition to the lightweight and Midweight Ready Mix Joint Compound products, the facility produces several other product families of drywall finishing products. The manufacturing for all products made at this facility have similar energy, waste, and water input requirements. Allocation was done on a mass basis.

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 regulated by the HPR (Hazardous Products Regulations) and via Health Canada's national hazard standard "WHMIS" 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 Calgary, AB manufacturing plant.

Results

Environmental Impact Assessment Results

IPCC AR5 GWP 100, TRACI 2.1

per 100 m2.

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

Lightweight 17 L Cartons

Impact Category	Method	Unit	A1A2A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP-total	IPCC AR5 GWP 100	kg CO2 eq	1.70e+1	7.76e-1	1.80e+0	0	0	0	0	0	0	0	0	4.82e-1	0	7.40e-1
ODP	TRACI 2.1	kg CFC 11 eq	9.49e-7	2.92e-11	1.82e-11	0	0	0	0	0	0	0	0	1.81e-11	0	4.20e-14
AP	TRACI 2.1	kg SO2 eq	9.19e-2	4.64e-3	8.80e-3	0	0	0	0	0	0	0	0	2.88e-3	0	4.74e-3
EP	TRACI 2.1	kg N eq	3.26e-2	2.57e-4	2.27e-3	0	0	0	0	0	0	0	0	1.60e-4	0	2.10e-4
POCP	TRACI 2.1	kg O3 eq	1.55e-2	1.18e-4	1.58e-4	0	0	0	0	0	0	0	0	7.33e-5	0	3.94e-4
ADP-fossil	TRACI 2.1	MJ	4.46e+1	1.37e+0	9.63e-1	0	0	0	0	0	0	0	0	8.48e-1	0	1.31e+0
GWP-fossil	IPCC AR5 GWP 100	kg CO2 eq	1.88e+1	7.76e-1	1.53e+0	0	0	0	0	0	0	0	0	4.82e-1	0	7.69e-1

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.

per 100 m2.

Midweight 12 L Pail

Impact Category	Method	Unit	A1A2A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP-total	IPCC AR5 GWP 100	kg CO2 eq	1.65e+1	7.76e-1	2.10e+0	0	0	0	0	0	0	0	0	4.82e-1	0	7.40e-1
ODP	TRACI 2.1	kg CFC 11 eq	3.52e-7	2.92e-11	1.82e-11	0	0	0	0	0	0	0	0	1.81e-11	0	4.20e-14
AP	TRACI 2.1	kg SO2 eq	6.45e-2	4.64e-3	1.02e-2	0	0	0	0	0	0	0	0	2.88e-3	0	4.74e-3
EP	TRACI 2.1	kg N eq	1.33e-2	2.57e-4	2.75e-3	0	0	0	0	0	0	0	0	1.60e-4	0	2.10e-4
POCP	TRACI 2.1	kg O3 eq	8.22e-3	1.18e-4	1.78e-4	0	0	0	0	0	0	0	0	7.33e-5	0	3.94e-4
ADP-fossil	TRACI 2.1	MJ	5.46e+1	1.37e+0	9.89e-1	0	0	0	0	0	0	0	0	8.48e-1	0	1.31e+0
GWP-fossil	IPCC AR5 GWP 100	kg CO2 eq	1.68e+1	7.76e-1	1.77e+0	0	0	0	0	0	0	0	0	4.82e-1	0	7.69e-1

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.

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.

Resource Use Indicators
per 100 m2.

Lightweight 17 L Carton

Indicator	Unit	A1A2A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPRE	MJ, net calorific value	5.47e+1	0	1.06e-1	0	0	0	0	0	0	0	0	0	0	1.69e+0
RPRM	MJ, net calorific value	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RPRT	MJ, net calorific value	5.47e+1	0	1.06e-1	0	0	0	0	0	0	0	0	0	0	1.69e+0
NRPRE	MJ, net calorific value	4.37e+2	9.94e+0	7.08e+0	0	0	0	0	0	0	0	0	6.17e+0	0	1.04e+1
NRPRM	MJ, net calorific value	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRPRT	MJ, net calorific value	4.37e+2	9.94e+0	7.08e+0	0	0	0	0	0	0	0	0	6.17e+0	0	1.04e+1
FW	m3	1.95e-1	0	2.45e-4	0	0	0	0	0	0	0	0	0	0	2.61e-3

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.

CertainTeed Lightweight and Midweight Joint Compound (Calgary)

CertainTeed



per 100 m2.

Midweight 12 L Pail

Indicator	Unit	A1A2A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPRE	MJ, net calorific value	3.46e+1	0	1.31e-1	0	0	0	0	0	0	0	0	0	0	1.69e+0
RPRM	MJ, net calorific value	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RPRT	MJ, net calorific value	3.46e+1	0	1.31e-1	0	0	0	0	0	0	0	0	0	0	1.69e+0
NRPRE	MJ, net calorific value	5.65e+2	9.94e+0	7.29e+0	0	0	0	0	0	0	0	0	6.17e+0	0	1.04e+1
NRPRM	MJ, net calorific value	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRPRT	MJ, net calorific value	5.65e+2	9.94e+0	7.29e+0	0	0	0	0	0	0	0	0	6.17e+0	0	1.04e+1
FW	m3	1.74e-1	0	3.01e-4	0	0	0	0	0	0	0	0	0	0	2.61e-3

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 100 m2.

Lightweight 17 L Carton

Indicator	Unit	A1A2A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	kg	1.03e-8	0	2.26e-11	0	0	0	0	0	0	0	0	0	0	2.23e-10
NHWD	kg	6.74e-2	0	2.36e+0	0	0	0	0	0	0	0	0	0	0	5.18e+1
RWD	kg	3.99e-3	0	1.01e-5	0	0	0	0	0	0	0	0	0	0	1.16e-4
HLRW	kg	4.76e-6	0	1.12e-8	0	0	0	0	0	0	0	0	0	0	1.20e-7
ILLRW	kg	3.98e-3	0	1.00e-5	0	0	0	0	0	0	0	0	0	0	1.16e-4

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 Lightweight and Midweight Joint Compound (Calgary)

CertainTeed



per 100 m2.

Midweight 12 L Pail

Indicator	Unit	A1A2A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	kg	3.00e-8	0	2.78e-11	0	0	0	0	0	0	0	0	0	0	2.23e-10
NHWD	kg	1.03e-1	0	2.89e+0	0	0	0	0	0	0	0	0	0	0	5.18e+1
RWD	kg	5.04e-3	0	1.24e-5	0	0	0	0	0	0	0	0	0	0	1.16e-4
HLRW	kg	5.88e-6	0	1.38e-8	0	0	0	0	0	0	0	0	0	0	1.20e-7
ILLRW	kg	5.03e-3	0	1.23e-5	0	0	0	0	0	0	0	0	0	0	1.16e-4

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 100 m2.

Lightweight 17 L Carton

Indicator	Unit	A1A2A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
BCRP	kg CO2	-1.10e+0	0	0	0	0	0	0	0	0	0	0	0	0	0
BCEP	kg CO2	0	0	0	0	0	0	0	0	0	0	0	0	0	1.10e+0
BCRK	kg CO2	-3.05e+0	0	0	0	0	0	0	0	0	0	0	0	0	0
BCEK	kg CO2	0	0	3.05e+0	0	0	0	0	0	0	0	0	0	0	0

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, CWNCR = Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes, GWP-luc = Carbon Emissions from Land-use Change.

per 100 m2.

Mid Weight 12L Pail

Indicator	Unit	A1A2A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
BCRP	kg CO2	-8.06e-1	0	0	0	0	0	0	0	0	0	0	0	0	0
BCEP	kg CO2	0	0	0	0	0	0	0	0	0	0	0	0	0	8.06e-1
BCRK	kg CO2	-1.75e-2	0	0	0	0	0	0	0	0	0	0	0	0	0
BCEK	kg CO2	0	0	1.75e-2	0	0	0	0	0	0	0	0	0	0	0

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.

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:	500 km
Capacity Utilization:	85 %
Packaging Mass:	3.62 kg
Gross density of products transported:	1146 kg/m ³
Capacity utilization volume factor:	=1

Installation in to the building/construction site (A5)

A5 Module

Installation Scrap Rate Assumed:	3 %
Mass of Packaging Waste Specified by Type:	3.62 kg
Biogenic Carbon Contained in Packaging:	0.834 kg
Assumptions for scenario development:	Joint Compounds are installed by hand. As required by the PCR, this study assumes installation waste at 3%. There is no use stage energy or water consumption associated with the joint compound products. In addition, disposal of the packaging material is included in the installation phase. Waste at 3%. There is no use stage energy or water consumption associated with the joint compound products.

Reference Service Life

B1 Module

RSL:	75 Years
Declared Product Properties:	
N/A	
Design Application Parameters:	
N/A	
An Assumed Quality of Work, When Installed in Accordance with The Manufacturer's Instructions:	
N/A	
Outdoor Environment:	
N/A	
Indoor Environment:	
N/A	
Use Conditions:	
N/A	

Maintenance:

N/A

Maintenance (B2)

B2 Module

Maintenance Process Information: N/A

Further assumptions for scenario development: N/A

Repair (B3)

B3 Module

Repair Process Information: N/A

Inspection Process Information: N/A

Further assumptions for scenario development: There are no required product-specific calculations for the use phase (modules B1-B7). Impacts from the use phase modules of joint compound are not anticipated and are reported as zero unless otherwise justified.

Replacement (B4)

B4 Module

Further assumptions for scenario development: N/A

Refurbishment (B5)

B5 Module

Refurbishment Process Description: N/A

Further assumptions for scenario development: N/A

Operational Energy Use & Operational Water Use

B6 & B7 Modules

Characteristic Performance:

N/A

Further assumptions for scenario development:

N/A

End of Life

C1 - C4 Modules

Collection Process

Collected with Mixed Construction Waste: 59.29 kg

Disposal

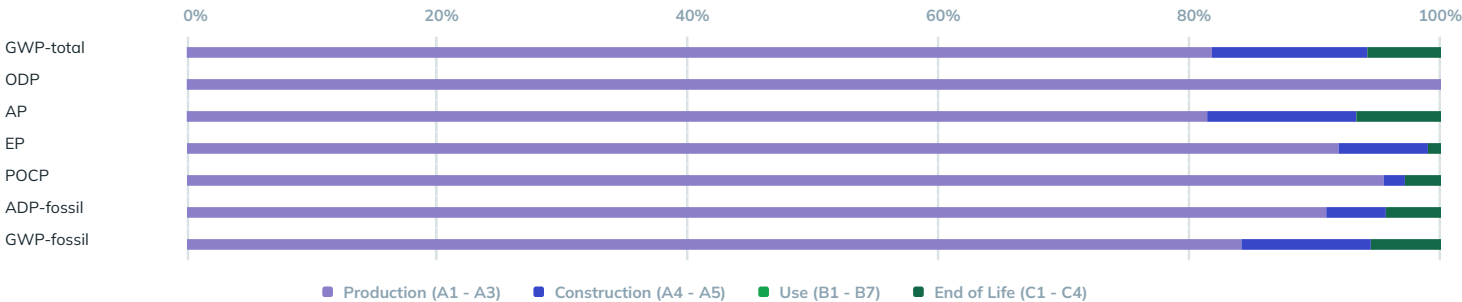
Product or Material for Final Disposal: 59.29 kg

Assumptions for scenario development:

This study assumes a product service life of 75 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. Just as the installation of the Lightweight, and Midweight Joint Compounds is done by hand, the deconstruction (module C1) is also assumed to be by hand, so this study assumes the deconstruction module of the end-of-life stage 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 Lightweight, and Midweight Joint Compounds 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.

Interpretation

The data pertaining to the operation of the Calgary, AB 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 Calgary, AB. A detailed evaluation of more time periods would serve to reduce this uncertainty. The life cycle assessment results indicate that the raw materials, raw materials transportation, and packaging have a significant impact on life cycle impacts of the products. Impact seen in the raw material transportation are due to the wait of raw materials and the long distance from source location to manufacture. Additionally, the final product density contributes to the higher impact potential due to the short distance from manufacture to installation, which is less than 500km. To mitigate environmental impacts, incorporating more recycled content into the packaging is recommended as it could reduces the environmental impacts of the packaging stage in the product’s life cycle.



Additional Environmental Information

- Environment and Health During Manufacture
- Safety Data Sheet is available for the Ready Mix Joint Compound products at <https://www.certainteed.ca/products/drywall-products-systems>. 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 WHMIS requirements are met or exceeded to ensure the health and safety of all employees and contractors.

- Condition of Use

Once, installed, drywall finishing products typically require no cleaning or maintenance.

- Environment and Health During Use

The Lightweight and Midweight Ready Mix Joint Compound Products do not require any additional energy or water during use and do not emit harmful emissions.

- Extraordinary Effects

The Lightweight and Midweight Ready Mix Joint Compound have no known fire, water or mechanical destruction extraordinary effects.

References

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- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
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