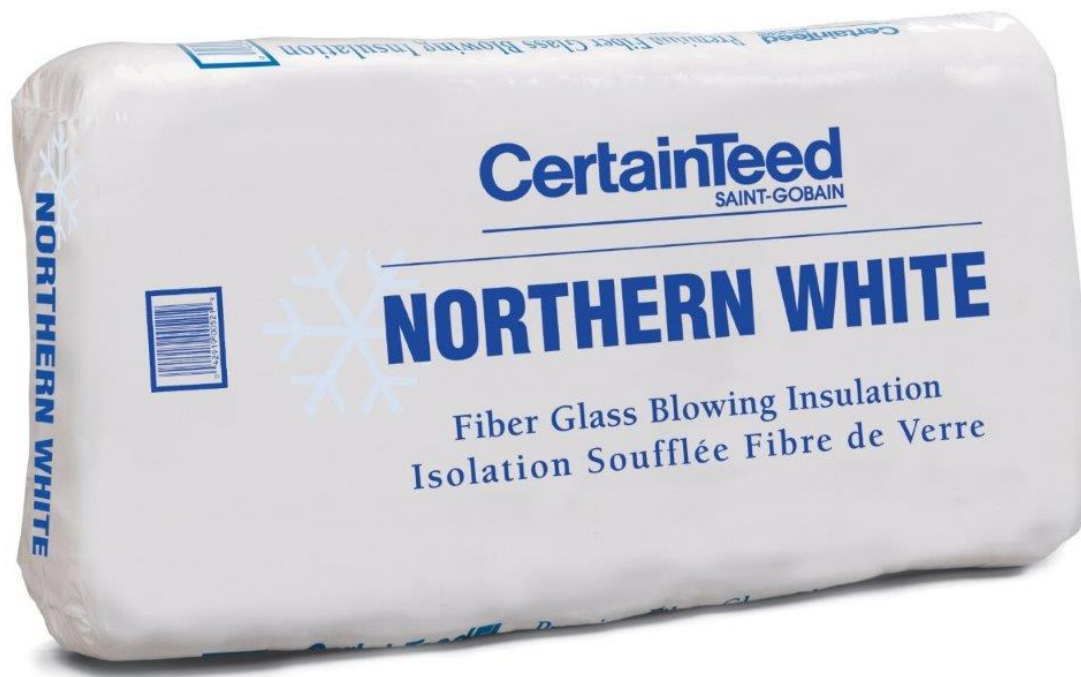


ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025 AND ISO 21930:2017

SmartEPD-2025-074-0546-01

Northern White Glass Fibre Loose Fill Insulation



Date of Issue:
Jun 23, 2025

Expiration:
Jun 23, 2030

Last updated:
Jun 24, 2025

General Information

CertainTeed Saint-Gobain

20 Moores Rd, Malvern, PA 19355

888-233-8990

Sustainability@Saint-Gobain.com [certainteed.com](https://www.certainteed.com)



Product Name:	Northern White Glass Fibre Loose Fill Insulation
Functional Unit:	1 m2 of material with RSI = 1m2K/W
Declaration Number:	SmartEPD-2025-074-0546-01
Date of Issue:	June 23, 2025
Expiration:	June 23, 2030
Last updated:	June 24, 2025
EPD Scope:	Cradle to gate with other options A1 - A3, A4, A5, C1 - C4
Market(s) of Applicability:	North America

General 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.certainteed.ca/>

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.

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: Building Envelope Thermal Insulation Products Date of issue: April 10, 2023 Valid until: October 10, 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:

 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

 Nathan Ayer |  EarthShift Global |  nathan@earthshiftglobal.com

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

External

 Nathan Ayer |  EarthShift Global |  nathan@earthshiftglobal.com

Product Information

Functional Unit:

1 m2 of material with RSI = 1m2K/W

Mass:

0.46 kg

Reference Service Life:

75 Years

Product Specificity:

 Product Average
 Product Specific

Product Description

CertainTeed is dedicated to Making the World a Better Home with insulation products that are produced with a commitment to minimizing environmental impact and improving energy savings. CertainTeed's insulation products included in this EPD are: Northern White Glass Fibre Loose Fill Insulation. The declared unit of the product reported in this document is 1 square meter of insulation material with a thickness that provides an average thermal resistance RSI = 1 m2 K/W (R=5.68), packaging included.

Northern White Fibre Glass Blowing Insulation is used in residential and commercial construction as a thermal and acoustical insulation. It is designed for pneumatic installation in open attic or ceiling plenum areas with flat flooring or up to a maximum slope of 4.5:12.

This product is non-combustible, non-corrosive and odour free. In addition, Northern White won't settle, contains no chemicals to cause mildew and fungus growth, provides no sustenance for vermin, contains no asbestos, won't rot or decay and won't absorb moisture. Northern White is made from a combined minimum of 65% pre- and post-consumer recycled content.

Further information can be found at: <https://www.certainteed.ca/products/building-insulation-products/northern-white>

Product Specifications

Product Classification Codes:

UNSPSC - 30141500
EC3 - ThermalMoistureProtection -> Insulation -> BlownInsulation

Form Factor:

ThermalMoistureProtection >> Insulation >> BlownInsulation

Insulation type:

Fiberglass

Density: 8.65 kg/m3
Intended Application: Wall & General

Material Composition

Material/Component Category	Origin	% Mass
External Glass Cullet - Externally Sourced Recycled Content (Secondary Material)	None	55-65
Internal Glass Cullet - Reprocessed within the manufacturing plant	None	20-30
Borax	None	5-15
Nepheline	None	0-5
Soda Ash	None	0-5
Other Additives	None	0-2

Packaging Material	Origin	kg Mass
Film (LDPE)	None	None

Hazardous Materials
No regulated hazardous or dangerous substances are included 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.

System Boundary

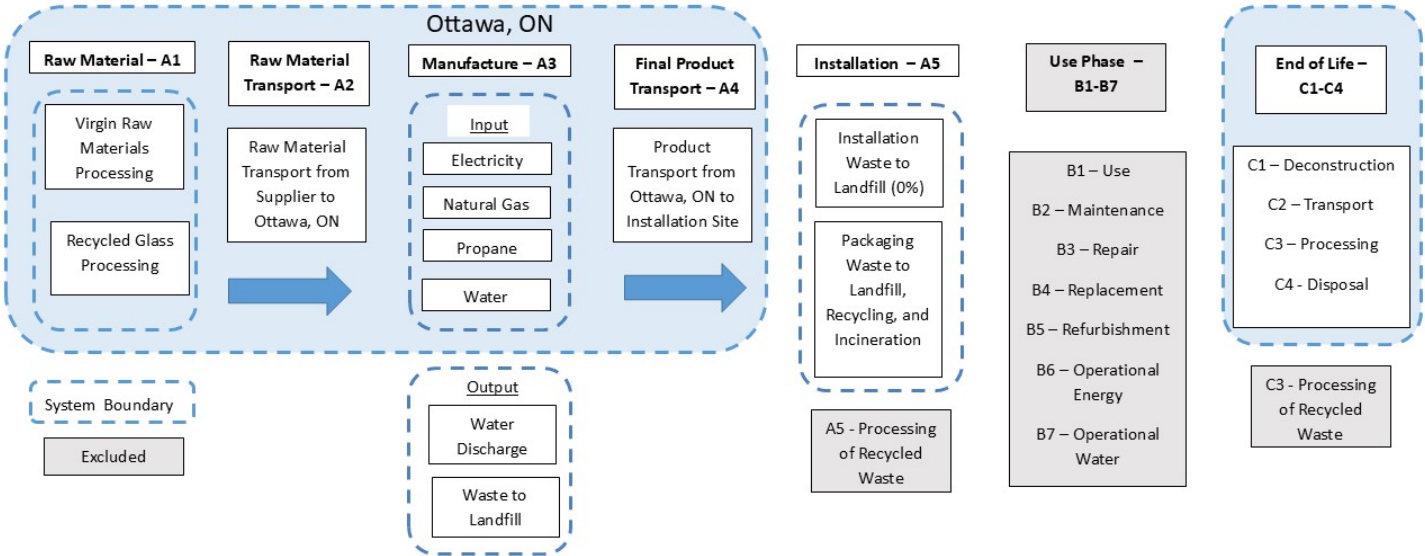
Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	✓
	A5	Assembly / Install	✓
Use	B1	Use	ND
	B2	Maintenance	ND
	B3	Repair	ND
	B4	Replacement	ND
	B5	Refurbishment	ND
	B6	Operational Energy Use	ND
	B7	Operational Water Use	ND
End of Life	C1	Deconstruction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

Plants



CertainTeed Insulation - Belgreen Drive, Ontario
3985 Belgreen Drive, Ottawa, ON, Canada

Product Flow Diagram



Software and Database

LCA Software:	 GaBi v. 10.9.0.20
LCI Foreground Database(s):	 GaBi Professional Database v. 2024.2  North America  Mass
LCI Background Database(s):	 Ecoinvent v. 3.9  North America  Mass

Data Quality

For the data used in this EPD, the data quality is considered to be of good to high quality. The data and datasets cover all relevant process steps and technologies over the supply chain of the represented product. 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 primary data on energy and material inputs, wastes, water use, emissions, and transportation impacts for the included manufacturing plant.

Life Cycle Module Descriptions

This EPD is declared under a cradle to gate with options system boundary, which included modules A1-A5 and C1-C4. C1 and C3 are assumed to have no impact because loose fill deconstruction is done manually, and no processing is done prior to landfill/recycle within this system boundary.

Raw Materials (Module A1)

A thorough analysis of the material inputs was completed for the inventory of this study. All glass cullet (secondary material) was modeled as a raw material and included sorting, pretreatment, and transportation.

Transportation of Raw Materials (Module A2)

Raw materials are transported to the manufacturing sites by standard freight truck. Unless otherwise noted, transport vehicles are fueled with diesel fuel. The raw material transportation distance were modeled based on the actual data provided by experts from the plant.

Manufacturing (Module A3)

A detailed analysis of the Glass Fibre Loose Fill Insulation manufacturing process was completed by the Saint-Gobain North American ESG Department. To produce Glass Fibre Loose Fill Insulation, the glass component raw materials are melted and formed into fibers. The additive components are sprayed onto the fibers and conditioned. The fiber / additive mixture is then packaged. Energy, water, and materials go into the Glass Fibre Loose Fill Insulation process and waste and emissions are outputs from the manufacturing process.

Packaging (Module A3)

Packaging of the final product after production is included in the life cycle assessment. The product is packaged in a pre-printed LDPE plastic bag. The weight of each packaging component was provided by CertainTeed Insulation facility personnel.

Transport from the Gate to the Site (Module A4)

Final products are transported on trucks throughout Canada. This study assumed an average 1,068 km for the final shipment of product based on a weighted average of distances to sales location during 2023 period.

Installation (Module A5)

The thermal resistance (R-value) of glass fibre loose fill is dependent on the proper application of the required material. One of the most significant criteria for achieving the desired R-value is meeting the designated minimum weight per square foot of material. It is also important the minimum thickness be achieved, since along with the required weight per square foot of material, is essential to obtain the desired R-value. The correct values for coverage for each fibre glass loose fill insulation are stated in a specifications chart on the bag label for the finished product. Before fibre glass loose fill insulation is installation, the area to be insulated is measured. From these measurements, a number of bags or pounds of insulation is determined.

Open blow applications refer to those installations in residential or commercial buildings where the loose fill insulation

For floor and ceiling installation, a hole created in the to the surface and a blowing machine hose is inserted into the hole to fill the cavity with product. For sloped surfaces up to 4.5:12 pitch at a thickness to reach a desired R-value.

The following installation procedure is advised:

- Hold the blowing hose parallel to the floor and apply the insulation parallel to the floor rafters to prevent void areas and product compaction against framing members. The material arc length should typically be at least 3.6 meters (m) when the blowing hose is held horizontal at waist height. Minimize hand cupping of the material to avoid densification and loss of coverage.
- Do not overload the blowing machine hopper with material. Too long a material dwell time combined with agitation of the hopper components can overprocess the Glass Fibre Loose Fill Insulation, creating smaller, denser particles that may install too quickly and not provide satisfactory coverage or clog the machine shredder or airlock components.
- To ensure adequate material conditioning and velocity, tailor your material feed rate to the smaller diameter blowing hose in use, i.e., slower feed rate for 76.2 mm versus 88.9-inch-diameter blowing hoses. Set up the blowing hose such that the smallest diameter hose is the longest in length.

The disposal of packing (LPDE plastic bag) is allocated to installation (module A5).

Use (Modules B1-B7)

The use phase is not included in the analysis because it is optional within the PCR Part B.

End of Life - Deconstruction (Module C1)

Removal at the end of life requires human labor only and therefore deconstruction does not contribute to the lifetime environmental impacts.

End of Life Transport (Module C2)

After removal, the insulation is assumed to be transported 160 km (100 miles) to the disposal site to be landfilled or recycled.

End of Life Waste Processing (Module C3)

Glass fibre insulation can be reused but typically is not following its removal from a building prior to demolition. Although recycling is feasible, there are minimal recycling programs and infrastructure; therefore, the current practice is to send the waste to a landfill. The PCR Part A allows for a small portion of recycling (7%) for other products which was used for this product. The waste processing module (C3) of the end-of-life stage is also assumed to be burden free. No waste processing is required before being landfill and any recycling processing would be considered in the next system boundary for the material's next use as a raw material.

End of Life Disposal (Module C4)

Removal is typically associated with demolition or remodeling activities. The product's end-of-life is assumed to be inert in a landfill (93%) and recycled (7%) based on the Part A (Product Category Rules for Building-Related Product and Services: Part A Life Cycle Assessment Calculation Rules and Report Requirements. Version 4. March 2022. UL Environment) guidance) and Industry EPD (2023). Disposal in a municipal landfill or in commercial incineration facilities is permissible and should be done in accordance with local, provincial, and federal regulations.

LCA Discussion

Allocation Procedure

All allocation of waste, water, energy and other manufacturing data for the included facility was based on production mass. This is not the only product made at the facility. Production of the declared product at the facility is based on mass production.

Cut-off Procedure

All inputs and outputs to a process shall be included in the calculation of results, for which data are available, except for the "Use phase" which is excluded from the study. Any data gaps are filled by conservative assumptions with average, generic, or proxy data.

For hazardous substances, as defined by the U.S. Resource Conservation and Recovery Act (RCRA), 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 LCA is in compliance with the cut-off criteria since no known processes were neglected or excluded from this analysis outside of the specific items outside the system boundary.

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

Scenarios

Transport to the building/construction site (A4)

A4 Module

Fuel Type:	Diesel
Vehicle Type:	Truck
Transport Distance:	1,068 km
Packaging Mass:	1.17E-02 kg
Gross density of products transported:	8.55 kg/m ³
Weight of products transported:	0.46 kg
Capacity utilization volume factor:	=1
Assumptions for scenario development:	Final products are transported on trucks throughout Canada. This study assumed an average 1,068 km for the final shipment of product based on a weighted average of distances to sales location during 2023 period.

Installation in to the building/construction site (A5)

A5 Module

Installation Scrap Rate Assumed:	0 %
Mass of Packaging Waste Specified by Type:	Plastic Bags: 1.17E-02 kg
Biogenic Carbon Contained in Packaging:	0 kg
Assumptions for scenario development:	Product loss during installation is 0%. Installation energy (propane and diesel) impacts were included. Transportation of installation waste and disposal of packaging were included within this study. All installation waste disposal is based off Part A (Product Category Rules for Building-Related Product and Services: Part A – Life Cycle Assessment Calculation Rules and Report Requirements, Version 4. March 2022. UL Environment) guidance which for Canada recommends that Plastics are Recycling Rate: 78% and Landfill Rate: 22%.

End of Life (C1 - C4)

C1 - C4 Modules

Collection Process

Collected Separately:	0.03 kg
Collected with Mixed Construction Waste:	0.43 kg

Recovery

Reuse:	0.00 kg
Recycling:	0.03 kg

Landfill: 0.43 kg
Incineration with Energy Recovery: 0 kg
Energy Conversion: 0 kg

Disposal

Product or Material for Final Disposal: 0.46 kg
Removals of Biogenic Carbon: 0 kg CO₂

Assumptions for scenario development:

Product disposal at end of life was included within this study. Product disposal is based off Part A (Product Category Rules for Building-Related Product and Services: Part A – Life Cycle Assessment Calculation Rules and Report Requirements. Version 4. March 2022. UL Environment) guidance, which is Recycling Rate: 7% and Landfill Rate: 93% for all "Other Materials" in Canada.

Results

Environmental Impact Assessment Results

IPCC AR5 GWP 100, TRACI 2.1

per 1 m² of material with RSI = 1m²K/W of product .

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

Impact Category	Method	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
GWP-total	IPCC AR5 GWP 100	kg CO ₂ eq	4.79e-1	4.32e-5	7.26e-3	0	1.39e-5	0	1.17e-2
GWP-fossil	IPCC AR5 GWP 100	kg CO ₂ eq	4.68e-1	4.32e-5	7.04e-3	0	1.39e-5	0	1.17e-2
ODP	TRACI 2.1	kg CFC 11 eq	3.70e-7	1.61e-15	3.68e-14	0	5.18e-16	0	5.66e-14
AP	TRACI 2.1	kg SO ₂ eq	8.57e-4	2.56e-7	4.25e-5	0	8.22e-8	0	6.04e-5
EP	TRACI 2.1	kg N eq	3.20e-4	1.42e-8	4.68e-6	0	4.56e-9	0	2.71e-6
POCP	TRACI 2.1	kg O ₃ eq	1.59e-2	7.05e-6	1.24e-3	0	2.26e-6	0	1.17e-3

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.

Global Warming Potential or Climate Change is an indicator aimed at including in a single value the added effect of all the substances contributing to the greenhouse effect.

Global Warming Potential (GWP-Total) includes biogenic carbon, fossil carbon, land use and land use change. To calculate GWP-Total within the above table, the equation below is used:

$$\text{GWP-total} = \text{GWP-biogenic} + \text{GWP-fossil} + \text{GWP-luluc}$$

- *GWP-total* or *GWPtrtotal (including biogenic)* is the sum of GWP-biogenic, GWP-fossil and GWP-luluc
- *GWP-biogenic* only includes biogenic carbon which is carbon that is stored in bio-sourced materials, like plants, trees, and soil. This excludes fossil.
- *GWP-fossil* or *GWPtrtotal (excluding biogenic)* only includes fossil carbon which is the carbon dioxide emitted when fossil fuels like coal, oil, or natural gas are combusted. This excludes biogenic.
- *GWP-luluc* only includes the greenhouse gas emissions that arise in connection with changes in the specified carbon stock as a result of land use and land use change, such as deforestation.

Depending on the required or optional standards, GWP can be reported with different methods and indicators including United States Environmental Tool for Reduction and Assessment of Chemicals and Other Environmental Impacts (TRACI 2.1, TRACI 2.2, etc.), Intergovernmental Panel on Climate Change (IPCC) Assessment Report (AR 5, AR 6, etc.), Environmental Footprint (EF 3.0, 3.1), and/or EN 15804.

GWP can be reported on a time frame such as GWP 100 for 100-year time horizon.

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 1 m2 of material with RSI = 1m2K/W of product .

Indicator	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
PERE	MJ	1.45e-1	0	2.25e-3	0	0	0	1.87e-2
PERM	MJ	0	0	0	0	0	0	0
PERT	MJ	1.45e-1	0	2.25e-3	0	0	0	1.87e-2
PENRE	MJ	4.47e+0	5.49e-4	7.89e-2	0	1.76e-4	0	0
PENRM	MJ	1.76e-1	0	0	0	0	0	0
PENRT	MJ	4.65e+0	5.49e-4	7.89e-2	0	1.76e-4	0	0
ADP-fossil	MJ	9.51e-1	7.54e-5	1.12e-2	0	2.42e-5	0	2.22e-2
SM	kg	2.82e-1	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
FW	m3	1.36e-3	0	7.05e-6	0	0	0	0
RE	MJ	0	0	0	0	0	0	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:

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, NRPRRT 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 1 m² of material with RSI = 1m²K/W of product .

Indicator	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
HWD	kg	8.61e-11	0	9.05e-12	0	0	0	0
NHWD	kg	1.16e-2	0	2.23e-3	0	0	0	0
RWD	kg	-4.78e-6	0	1.95e-7	0	0	0	0
CRU	kg	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	3.24e-2
MER	kg	0	0	0	0	0	0	0
MNER	kg	0	0	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	0
EET	MJ	0	0	0	0	0	0	0

Note:

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

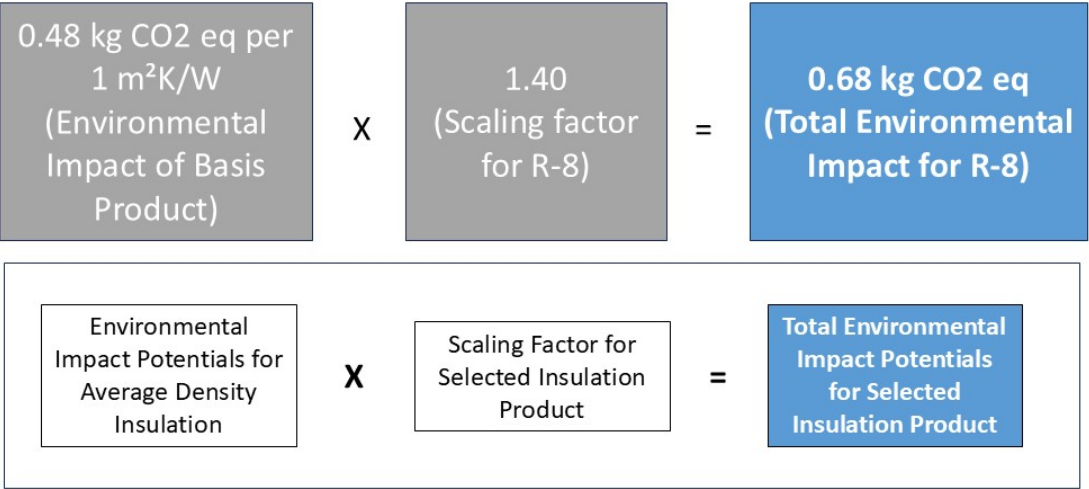
Abbreviations:

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.

Impact Scaling Factors

R-Value	RSI	Thickness (mm)	Scaling Factor
5.68 (Basis Product for RSI =1)	1	54	1
8	1.4	76	1.40
12	2.1	114	2.12
13	2.1	124	2.33
16	2.8	151	2.83
19	3.3	178	3.33
20	3.5	189	3.54
22	3.9	205	3.84
24	4.2	227	4.23
28	4.9	265	4.94
30	5.3	286	5.35
32	5.6	303	5.66
34	6.0	324	6.07
36	6.3	341	6.37
38	6.7	362	6.76
40	7.0	378	7.06
44	7.7	416	7.77
48	8.4	454	8.49
49	8.6	465	8.68
50	8.8	476	8.90
52	9.1	492	9.20
56	9.8	530	9.89
60	10.5	568	10.60

SCALING FACTORS and R-VALUES for OPEN ATTIC APPLICATION

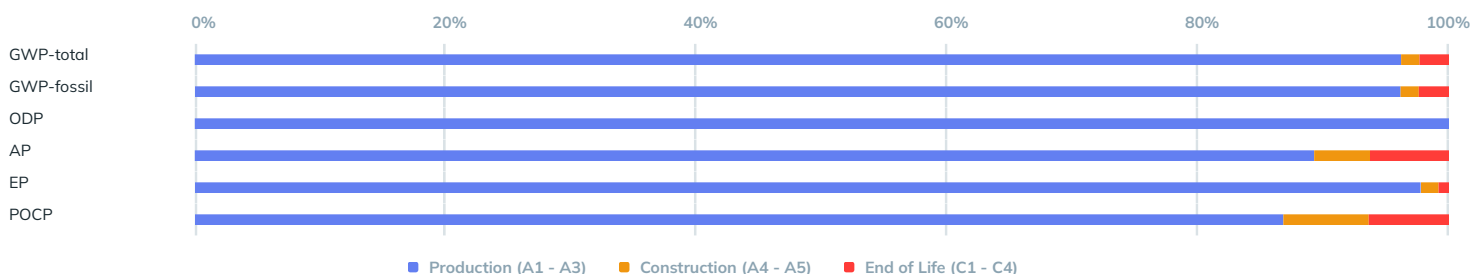


Interpretation

To ensure the completeness of the study, all relevant stages and aspects of the life cycle (excluding use phase) were taken into consideration. All necessary data and information were available and complete. Based on the results from the life cycle assessment, the life cycle impacts are strongly driven by the manufacturing process as well as the raw materials. Increasing energy efficiency would help to reduce the overall environmental impacts. Identifying alternate uses or recycling options for the product at the end of its useful life will reduce the end-of-life. If possible, incorporating more recycled content into the product will help reduce the environmental impacts of the raw materials stage in the life cycle of the product. Increasing recycled glass cullet would be a viable option. As recycled content increases, the raw materials driving impacts will decrease, thus improving the overall environmental impacts.

The natural gas is the largest contributors to the manufacturing stage, responsible for over 85% of the environmental impact potentials in several categories. Reducing natural gas consumption through increased efficiency and/or electrification of equipment would be recommended to reduce the environmental impacts.

Production accounts for the majority of the product impacts. Within production, natural gas is the highest impact.



Further Information

Modified Impact Results: Renewable Energy

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 reducing CO₂ equivalent emissions from electricity usage in the United States and Canada.

The updated results incorporate the impact of RECs on the electricity used in the manufacturing process (A3), as shown in the aggregated A1, A2, and A3 data in the Modified Impact Results: Renewable Electricity' table. The reduced impacts resulting from allocated RECs at Ottawa, ON were calculated using 100% wind-generated electricity, covering 28% of the plant's electricity consumption in 2023. The REC data was modeled using the US-SERC Electricity production, wind, 1-3MW turbine, onshore' dataset, with a carbon intensity of 13.2 kg CO₂e/MWh*. Any remaining energy not covered by RECs was modeled based on local energy grid information for the manufacturing site(s).

*GWP IPCC AR6 (excluding biogenic carbon) 100 year horizon

LCIA Method	Impact Category	Unit	A1A2A3	A4	A5	C1	C2	C3	C4
IPCC AR5 GWP 100	GWP-total	kg CO ₂ eq	4.79e-1	4.32e-5	7.26e-3	0	1.39e-5	0	1.17e-2
IPCC AR5 GWP 100	GWP-fossil	kg CO ₂ eq	4.68e-1	4.32e-5	7.04e-3	0	1.39e-5	0	1.17e-2
TRACI 2.1	ODP	kg CFC 11 eq	3.70e-7	1.61e-15	3.68e-14	0	5.18e-16	0	5.66e-14
TRACI 2.1	AP	kg SO ₂ eq	8.57e-4	2.56e-7	4.25e-5	0	8.22e-8	0	6.04e-5
TRACI 2.1	EP	kg N eq	3.20e-4	1.42e-8	4.68e-6	0	4.56e-9	0	2.71e-6
TRACI 2.1	POCP	kg O ₃ eq	1.59e-2	7.05e-6	1.24e-3	0	2.26e-6	0	1.17e-3

References

- Product Category Rules for Building-Related Product and Services: Part A Life Cycle Assessment Calculation Rules and Report Requirements, Version 4. March 2022. UL Environment.
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