

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025:2006 AND ISO 21930:2017

SmartEPD-2024-043-0199-01.1

Fiberglass Loose Fill Insulation - InsulSafe, InsulSafe SP, InsulSafe R, InsulSafe XC, InsulSafe Armor, OPTIMA



Date of Issue:	Expiration:	Last updated:
Oct 30, 2024	Oct 30, 2029	Aug 23, 2026

Refer to the EPD Library at www.smartepd.com for the latest EPD listing information



General Information

CertainTeed Saint-Gobain

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[certainteed.com](https://www.certainteed.com)



Product Name:	Fiberglass Loose Fill Insulation - InsulSafe, InsulSafe SP, InsulSafe R, InsulSafe XC, InsulSafe Armor, OPTIMA
Functional Unit:	1 m2
Declaration Number:	SmartEPD-2024-043-0199-01.1
Date of Issue:	October 30, 2024
Expiration:	October 30, 2029
Last updated:	August 23, 2026
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.com/>

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 14025:2006 and ISO 21930:2017
Core PCR:	UL Part A PCR for Building-Related Products and Services v4 Date of issue: March 01, 2022
Sub-category PCR:	UL Part B: Building Envelope Thermal Insulation Products v.3 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

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EPD Program Operator:

 Smart EPD

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Verification:

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

 Alison Conroy

 Independent Contractor

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

 Alison Conroy

 Independent Contractor

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External

External

Product Information

Functional Unit:

1 m2

Mass:

0.39 kg

Reference Service Life:

75 Years

Product Specificity:

✓ Product Average

✗ Product Specific

Product Description

CertainTeed Fiberglass Loose Fill Insulation is made of fiberglass that consists of renewable content, a high percentage of recycled glass that is noncombustible, noncorrosive, and odor-free. CertainTeed Fiberglass Loose Fill Insulation will not settle, contains no chemicals to cause mildew and fungus growth, contains no formaldehyde or asbestos, provides no sustenance for vermin, won't rot, or decay, and will not absorb moisture. The Fiberglass Loose Fill Insulation R-values included in this report are R11-68. CertainTeed Fiberglass Loose Fill are also UL Green Guard GOLD certified.

Further information can be found at:

<https://www.certainteed.com/products/building-insulation-products/optima-blow-insulation-system>
<https://www.certainteed.com/products/building-insulation-products/insulsafe-sp-premium-blowing-insulation>
<https://www.certainteed.ca/products/building-insulation-products/insulsafe-xc-blowing-insulation>
<https://www.certainteed.com/maxpro>

Product Specifications

Product Classification Codes:

UNSPSC - 30141500

EC3 - ThermalMoistureProtection -> Insulation -> BlownInsulation

Form Factor:

ThermalMoistureProtection >> Insulation >> BlownInsulation

Insulation type:

Fiberglass

Density:

7.12 kg/m³

Thickness for RSI =1:

60 mm

Intended Application:

Wall & General

Material Composition

Material/Component Category	Origin	% Mass
Silica Sand	Confidential	1-45
Feldspar	Confidential	0-25
Burnt Lime	Confidential	0-1
Borax	Confidential	5-15
Manganese	Confidential	0-1
Internal Glass Cullet – Reprocessed within the manufacturing plant	Confidential	5-25
Dolomite	Confidential	1-10
Sodium Sulfate	Confidential	0-1
Sodium Nitrate	Confidential	0-1
Soda Ash	Confidential	1-15
Limestone	Confidential	0-5
Silicone	Confidential	0-1
Oil	Confidential	0-1
Antistat	Confidential	0-1
Water	Confidential	0-1
External Glass Cullet – Externally sourced recycled content (secondary material)	Confidential	5-50

Packaging Material	Origin	kg Mass
Polypropylene Bag	Confidential	0.0101
Polyethylene Film	Confidential	0.00076
Corrugated Cardboard	Confidential	0.00043



Packaging Material	Origin	kg Mass
Label	Confidential	0.00002

Biogenic Carbon Content	kg C per m2
Biogenic carbon content in product	0None
Biogenic carbon content in accompanying packaging	0.000212

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:
This LCA is a weighted average of 3 sites based off production.

System Boundary

Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	✓
	A5	Assembly / Install	✓



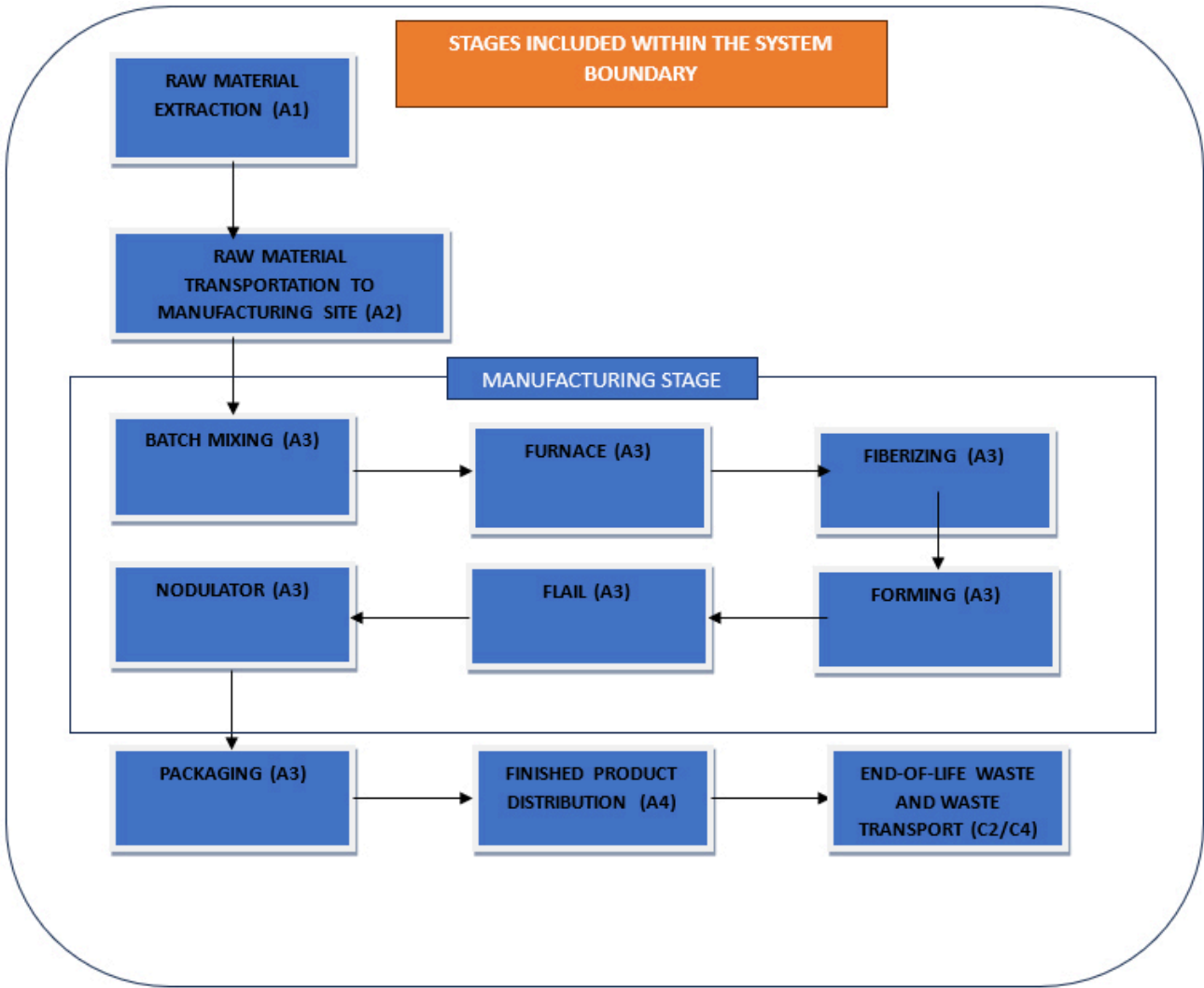
Use	B1	Use	ND
	B2	Maintenance	ND
	B3	Repair	ND
	B4	Replacement	ND
	B5	Refurbishment	ND
	B6	Operational Energy Use	ND
	B7	Operational Water Use	ND
End of Life	C1	Deconstruction	✓
	C2	Transport	✓
	C3	Waste Processing	✓
	C4	Disposal	✓
Benefits & Loads Beyond System Boundary	D	Recycling, Reuse Recovery Potential	ND

Note:
ND = Module not declared

Plants

- CertainTeed Interior Products Group (Chowchilla, CA) 17775 Ave 23 1/2, Chowchilla, CA 93610, United States
- CertainTeed Interior Products Group (Athens, GA) 425 Athena Dr, Athens, GA 30601, USA
- CertainTeed Interior Products Group (Kansas City, KS) 103 Funston Rd, Kansas City, KS 66115, USA

Product Flow Diagram



Software And Database

- LCA Software:

Sphera LCA for Experts (formerly GaBi) v. 10.8
- LCI Foreground Database(s):

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

Ecoinvent v. 3.9.1
- A foreground LCI database is the database used to model the primary, site-specific data collected for this EPD. A background LCI database is the database used to model generic or non-specific data.

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 specific data on energy and material inputs, wastes, water use, emissions, and transportation impacts for the included manufacturing plant(s).

Life Cycle Module Description

This LCA study is characterized as a “cradle to gate with options” study, examining the Fiberglass Loose Fill Insulation, product lines from raw material extraction through to final disposal.

For this life cycle assessment, the Saint-Gobain North America (SGNA) ESG department, with assistance from personnel at the manufacturing locations, collected specific data on energy and material inputs, wastes, water usage, emissions, and transportation impacts for the CertainTeed sites included within the study for calendar year 2023.

- Raw Materials (Module A1)

A thorough analysis of the material inputs was completed for the inventory of this study.

- Transportation of raw materials (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. 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 Fiberglass Loose Fill Insulation manufacturing process was completed by the Saint-Gobain North American ESG Department. To produce Fiberglass 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 and palletized. Energy, water, and materials go into the Fiberglass 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 plastic bag, paper labels are affixed, then the bags are stacked with other bagged product, and then the stack is wrapped in shrink-wrap before final shipping. 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 the United States. This study assumed an average of 700 km for the final shipment of product.

- Installation (Module A5)

Open blow applications refer to those installations in residential or commercial buildings where the loose fill insulation is installed pneumatically into attic and ceiling/roof plenum spaces onto flat, horizontal surfaces or sloped surfaces up to 6:12 pitch. InsulSafe SP can be installed to any incremental R-value thickness up to a R-60 level.

1. 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 12 feet when the blowing hose is held horizontal at waist height. Minimize hand cupping of the material to avoid densification and loss of coverage.

2. 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 InsulSafe SP, creating smaller, denser particles that may install too quickly and not provide satisfactory coverage or clog the machine shredder or airlock components.

3. 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 3-inch versus 3-1/2-inch-diameter blowing hoses. Set up the blowing hose such that the smallest diameter hose is the longest in length.

- Use (Modules B1-B7)

The use phase is excluded from the study.

- End of Life (Modules C1-C4)

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.

The product's end-of-life is assumed to be inert in a landfill. Currently there are no recycling scenarios for the Fiberglass Loose Fill Insulation 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. 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

Energy and water allocation for the included facilities is based on production mass. All facilities produce the product included in this EPD but this is not the only product made at each of the facilities. Production of the declared product at all the facilities is based on mass production. Results were calculated based on weighted average of the facilities. The manufacturing flow data was combined with resource extraction, processing, transportation, Installation, and deposition to landfill

Cut-off Procedure

All inputs and outputs to a process shall be included in the calculation of results, for which data are available. 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
Liters of Fuel:	30 l/100km
Vehicle Type:	Standard Freight Trailer
Transport Distance:	700 km
Capacity Utilization:	85 %
Packaging Mass:	0.011 kg
Gross density of products transported:	7.12 kg/m3
Capacity utilization volume factor:	<1

Installation in to the building/construction site (A5)

A5 Module

Waste Materials at the Construction Site Before	0.0113 kg
Waste Processing:	
Biogenic Carbon Contained in Packaging (kg C):	0.000212 kg
Assumptions for scenario development:	Open blow applications refer to those installations in residential or commercial buildings where the loose fill insulation is installed pneumatically into attic and ceiling/roof plenum spaces onto flat, horizontal surfaces or sloped surfaces up to 6:12 pitch. InsulSafe SP can be installed to any incremental R-value thickness up to a R-60 level. 1. 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 12 feet when the blowing hose is held horizontal at waist height. Minimize hand cupping of the material to avoid densification and loss of coverage. 2. 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 InsulSafe SP, creating smaller, denser particles that may install too quickly and not provide satisfactory coverage or clog the machine shredder or airlock components. 3. 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 3-inch versus 3-1/2-inch-diameter blowing hoses. Set up the blowing hose such that the smallest diameter hose is the longest in length. Energy to install Fiberglass Loose Fill Insulation was considered within this study. While construction or installation waste is included in this stage of the system boundary, this study assumes no insulation scrap generated from the installation of the product since contractors typically use scrap pieces to fill gaps, leaving very little to no waste from the installation. Packaging waste from installation has been accounted for in this study. Product loss per functional unit was generated by calculating the total scrap rate for each product. Since this product does not have a scrap rate at the installation site, the total product loss per function unit generated was 0. The waste materials at the construction site before waste processing included the product loss per functional unit and packaging waste. Within the LCA FE model, transportation of installation waste and disposal of packaging and product loss 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 3.2. December 2018. UL Environment) guidance. UL has recommended using the 2018 values instead of the 2022 packaging disposal values due to an error within the table.

End of Life (C1 - C4)

C1 - C4 Modules

Disposal

Product or Material for Final Disposal: 0.39 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. The product's end-of-life is assumed to be inert in a landfill. Currently there are no recycling scenarios for the Fiberglass Loose Fill Insulation 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. Disposal in a municipal landfill or in commercial incineration facilities is permissible and should be done in accordance with local, provincial, and federal regulations.

Results

Environmental Impact Assessment Results

IPCC AR5 GWP 100, TRACI 2.1, CML 2016 v4.8

per 1 m2 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	Unit	Method	A1 - A3	A4	A5	C1	C2	C3	C4
GWP-total [including biogenic carbon]	kg CO2 eq	IPCC AR5 GWP 100	8.68e-1	2.59e-2	7.17e-3	0	3.71e-4	0	8.71e-3
GWP-fossil [excluding biogenic carbon]	kg CO2 eq	IPCC AR5 GWP 100	8.64e-1	2.59e-2	6.90e-3	0	3.71e-4	0	8.74e-3
ODP	kg CFC 11 eq	TRACI 2.1	7.38e-7	9.69e-13	1.47e-13	0	1.38e-14	0	4.09e-16
AP	kg SO2 eq	TRACI 2.1	1.63e-3	1.54e-4	4.39e-5	0	2.20e-6	0	4.42e-5
EP	kg N eq	TRACI 2.1	6.50e-4	8.52e-6	4.48e-6	0	1.22e-7	0	1.90e-6
POCP	kg O3 eq	TRACI 2.1	2.50e-2	4.24e-3	1.15e-3	0	6.05e-5	0	7.90e-4
ADP-fossil	MJ	CML 2016 v4.8	1.09e+1	3.27e-1	5.14e-2	0	4.67e-3	0	1.25e-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 = 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.

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 GWPTotal (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 GWPTotal (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, etc.), Intergovernmental Panel on Climate Change (IPCC) Assessment Report (AR5, AR6, 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 a 100-year time horizon.

Resource Use Indicator

per 1 m2 of product.

Indicator	Unit	A1 - A3	A4	A5	C1	C2	C3	C4
PERE	MJ	ND	ND	ND	ND	ND	ND	ND
PERM	MJ	ND	ND	ND	ND	ND	ND	ND
PERT	MJ	ND	ND	ND	ND	ND	ND	ND
PENRE	MJ	ND	ND	ND	ND	ND	ND	ND
PENRM	MJ	ND	ND	ND	ND	ND	ND	ND
PENRT	MJ	ND	ND	ND	ND	ND	ND	ND
RPRE	MJ	1.84e+0	0	1.75e-4	0	0	0	1.60e-2
RPRM	MJ	0	0	0	0	0	0	0
RPRT	MJ	ND	ND	ND	ND	ND	ND	ND
NRPRE	MJ	1.19e+1	3.30e-1	5.19e-2	0	4.71e-3	0	1.29e-1
NRPRM	MJ	0	0	0	0	0	0	0
NRPRT	MJ	ND	ND	ND	ND	ND	ND	ND
ADP-fossil	MJ	ND	ND	ND	ND	ND	ND	ND
SM	kg	2.68e-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	3.39e-3	0	3.59e-6	0	0	0	1.67e-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:

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 1 m2 of product.

Indicator	Unit	A1 - A3	A4	A5	C1	C2	C3	C4
HWD	kg	4.77e-9	0	3.88e-13	0	0	0	3.19e-11
NHWD	kg	5.08e-2	0	2.72e-3	0	0	0	3.95e-1
RWD	kg	2.93e-4	0	2.57e-8	0	0	0	1.37e-6
HLRW	kg	3.50e-7	0	2.96e-11	0	0	0	1.54e-9
ILLRW	kg	2.92e-4	0	2.57e-8	0	0	0	1.37e-6
CRU	kg	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0
MNER	kg	ND	ND	ND	ND	ND	ND	ND
EEE	MJ	0	0	0	0	0	0	0
EET	MJ	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:

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 1 m2 of product.

Indicator	Unit	A1 - A3	A4	A5	C1	C2	C3	C4
BCRP	kg CO2	0	0	0	0	0	0	0
BCEP	kg CO2	0	0	0	0	0	0	0
BCRK	kg CO2	-7.77e-4	0	0	0	0	0	0
BCEK	kg CO2	0	0	7.77e-4	0	0	0	0
BCEW	kg CO2	0	0	0	0	0	0	0
CCE	kg CO2	0	0	0	0	0	0	0
CCR	kg CO2	-9.49e-3	0	0	0	0	0	0
CWNR	kg CO2	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:

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.

Scaling Factors

Open Attic	Product Specific Functional/Declared Unit Multiplier
R-60	11.10
R-49	9.00
R-44	7.99
R-38	6.88
R-30	5.28
R-26	4.53
R-22	3.79
R-19	3.30
R-13	2.25
R-11	1.92

Closed Cavity	Product Specific Functional/Declared Unit Multiplier
R-14	4.33
R-15	5.78
R-22	6.81
R-23	7.94
R-24	10.21
R-29	8.97
R-31	11.97
R-38	13.35
R-40	17.17
R-45	13.92
R-48	18.56
R-55	19.13
R-56	20.49

Scaling factors can be used to determine the impacts of the insulation portion of the Fiberglass Loose Fill Insulation. The following scaling factors shown are based on the mass of the CertainTeed Fiberglass Loose Fill Insulation produced in Kansas City, Athens, and Chowchilla. To determine the impacts, multiply the impact results within results tables shown by the scaling factor listed.

0.91 kg CO2 eq per
1 m²K/W
(Environmental
Impact of Basis
Product)

X

5.78
(Scaling factor
for R-15 closed
cavity)

=

5.26 kg CO2 eq
(Total Environmental
Impact for R-15
closed cavity)

Environmental
Impact Potentials for
Average Density
Insulation

X

Scaling Factor for
Selected Insulation
Product

=

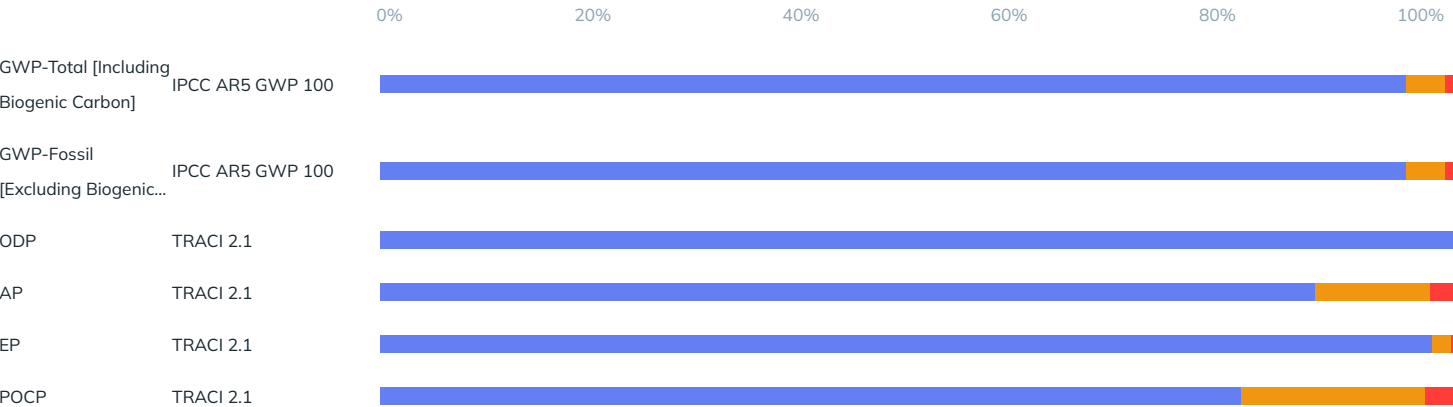
Total Environmental
Impact Potentials
for Selected
Insulation Product

Interpretation

To ensure the completeness of the study, all relevant stages and aspects of the life cycle 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 and electricity are the largest contributors to the manufacturing stage, responsible for over 90% 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.

Within the raw material stage, borax and soda ash are the top contributors. Increasing recycled content as mentioned above, will help decrease the usage of these larger contributors.



ADP-Fossil

CML 2016 V4.8

■ Production (A1 - A3) ■ Construction (A4 - A5) ■ End of Life (C1 - C4)

Modified Impact Results: Renewable Electricity

per 1 m2 of product.

Impact Category	Unit	Method	A1 - A3	A4	A5	C1	C2	C3	C4
GWP-total	kg CO2 eq	IPCC AR5 GWP 100	8.11e-1	2.59e-2	7.17e-3	0	3.71e-4	0	8.71e-3
ODP	kg CFC 11 eq	TRACI 2.1	7.38e-7	9.69e-13	1.47e-13	0	1.38e-14	0	4.09e-16
AP	kg SO2 eq	TRACI 2.1	1.57e-3	1.54e-4	4.39e-5	0	2.20e-6	0	4.42e-5
EP	kg N eq	TRACI 2.1	6.51e-4	8.52e-6	4.48e-6	0	1.22e-7	0	1.90e-6
POCP	kg O3 eq	TRACI 2.1	2.40e-2	4.24e-3	1.15e-3	0	6.05e-5	0	7.90e-4
ADP-fossil	MJ	TRACI 2.1	1.03e+1	3.27e-1	5.14e-2	0	4.67e-3	0	1.25e-1
GWP-fossil	kg CO2 eq	IPCC AR6 GWP 100	8.06e-1	2.59e-2	6.90e-3	0	3.71e-4	0	8.74e-3

Note:

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 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). The reduced impacts resulting from allocated RECs at Chowchilla, Athens, and Kansas City were calculated using 100% wind-generated electricity, covering 31% (Kansas City), 30% (Chowchilla), and 28% (Athens) 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 sites. *GWP IPCC AR6 (excluding biogenic carbon)

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