Environmental Product Declaration
1/2 in. (12.7 mm) Securock® Brand UltraLight Coated And Uncoated Glass-Mat Roof Board

Hagersville, ON (Canada), Shoals, IN, Sweetwater, TX

High-performance glass-mat roof board for use in low-slope commercial roofing systems

- Exceptional bond and low absorption in cold-applied adhesive applications
- Ideal for use as cover board in single-ply mechanically attached systems
- Lightweight core; up to 18% lighter than competitive products
- Moisture- and mold-resistant core and facer
- Provides protection to roof system from hail and foot traffic
- Fire-resistant for use as fire barrier and thermal barrier
- Unmatched mat-to-core tensile bond strength makes facer less likely to delaminate when cutting
- High-quality tight mat makes for easier handling and cutting

TRACI V2.1 ENVIRONMENTAL IMPACTS (CRADLE-TO-GRAVE)		
Functional Unit	**1 m^2**	**1 sf**
Global Warming Potential (kg CO_2 eq.)	**6.57E+00**	**6.10E-01**
Ozone Depletion Potential (kg CFC-11 eq.)	**3.33E-09**	**3.09E-10**
Acidification Potential (kg SO_2 eq.)	**1.69E-02**	**1.57E-03**
Eutrophication Potential (kg N eq.)	**1.27E-03**	**1.18E-04**
Photochemical Ozone Creation Potential (kg O_3	**2.40E-01**	**2.23E-02**
Abiotic Resource Depletion Potential Fossil Fuels	**1.36E+01**	**1.26E+00**

For over a century, sustainable practices have naturally been an inherent part of our business at USG and CGC. Today, they help shape the innovative products that become the homes where we live, the buildings where we work and the arenas where we play. From the product formulations we choose, to the processes we employ, USG and CGC are committed to designing, manufacturing, and distributing products that minimize overall environmental impacts and contribute toward a healthier living space. We believe that transparency of product information is essential for our stakeholders and Environmental Product Declarations (EPDs) are the next step toward an even more transparent USG and CGC. For additional information, visit usg.com, cgcinc.com and usg.ecomedes.com.

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This declaration is an Environmental Product Declaration (EPD) in accordance with ISO 14025 and ISO 21930; 2007. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. Accuracy of Results: EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.

DECLARATION NUMBER	EPD 285
PROGRAM OPERATOR	ASTM International – 100 Barr Harbor Drive, West Conshohocken, PA USA www.astm.org
DECLARATION HOLDER	USG Corporation - 550 W. Adams St., Chicago, IL USA
DECLARED PRODUCT	1/2 in. (12.7 mm) Securock® Brand UltraLight Coated and Uncoated Glass-Mat Roof Board
REFERENCE PCR	UL - Product Category Rule (PCR) Guidance for Building-Related Products and Services; Part B: Roof Cover Protection Board EPD Requirements, UL 10010-36, November 2, 2021
DATE OF ISSUE PERIOD OF VALIDITY	4/1/22 5 Years
CONTENTS OF THE DECLARATION	This EPD is complete and contains the following: • Product System Documentation • Life Cycle Calculation Rules • Life Cycle Assessment Results • Further Information • References

This declaration was independently verified in accordance with ISO 14025 and ISO 21930:2017 ☐ INTERNAL ☒ EXTERNAL	Tim Brooke, ASTM International
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas P. Gloria, Industrial Ecology Consultants

1. Product System Documentation

1.1 Product Description and Product Identification

Securock® Brand UltraLight Coated Glass-Mat Roof Board is a high-performance roof board for use in low-slope commercial roofing systems. It enhances the durability of the entire roofing system when used as cover board in low-slope commercial roof systems. Its specially treated core and high-performance glass-mat facer provide protection against fire, mold and moisture. Securock® UltraLight Coated Glass-Mat Roof Board combines superior strength and an ultralight core applicable for all cold adhesive roof applications.

Securock® Brand UltraLight Glass-Mat Roof Board is a high-performance roof board for use in low-slope commercial roofing systems. It enhances the durability of the entire roofing system when used as cover board in single-ply mechanically attached systems. Its specially treated core and high-performance glass-mat facer provide protection against fire, mold and moisture.

1.2 Advantages

- **Lightweight**: Newly engineered to provide exceptional strength while 18% lighter than competitive panels.
- **Fire Performance**: Meets Factory Mutual (FM) Class 1 and Underwriters Laboratories (UL) Class A fire ratings for unlimited slope in fire barrier applications per UL 790.
- **Easier to Cut**, Handle and Install: High-quality mat produces less itchiness than competitive products.
- **Moisture and Mold**: Fiberglass face and back with treated core provide moisture and mold resistance. Scored a maximum “10” for mold resistance on ASTM D3273.resistance.

1.3 Product Technical Data

Table 1: Summary of the technical data

Name	Standard	Value	Unit
Mass	--	1.80	lbs./sf, nominal
Thickness	ASTM C473	0.50	Inches, nominal
Compressive strength	ASTM C473	700 - 1000	psi, nominal
Total Water absorption	ASTM C473	10	% max
Surface Water absorption	ASTM C473	N/A	% max
R-Value	ASTM C518	0.53	
Thermal Expansion.	ASTM C473	8.5×10^{-06}	inches/inch•°F
Linear Variation with Change in Moisture	ASTM D1037	6.3×10^{-06}	inches/inch•%RH
Permeance, perms per ASTM E96	ASTM E96	18	perms
Class Fire Resistance	ASTM E84	Class A	0/0 Rating
Flute Span	ASTM E661	5	inches

1.4 Placing on the Market/Application Rules

Standard rules for installing glass mat roof board products are available online at usg.com and cgcinc.com.

1.5 Product Composition

Table 2: Product specifications and formula

	Measurement	Value
Product Specifications	Thickness	1/2 in. (12.7 mm)
	Lengths	4-8 ft. (1219-2438 mm)
	Width	4 ft. (1219 mm)
	Weight (nominal)	1.8 lb./sq. ft. (8.8 kg/m^2)
	Edges	Square

	Additive	Percentage
Product Formulation	Gypsum	92-94%
	Glass Mat	3-5%
	Additives	3%

1.6 Product Manufacture

The manufacture of gypsum panel products start with the combining of the dry ingredients in a screw conveyor, feeding of this dry ingredient mixture into a pin mixer where these dry ingredients are mixed with water and wet additives. The resulting slurry is fed between two glass-mat facers. The wet gypsum panel is allowed to hydrate after which the hard panel is cut and transferred into a kiln for evaporation of excess water. After removal of the evaporative water, the panel is cut to its final size, and the resulting product is ready for shipment. Any gypsum panel product not meeting quality control specifications is disposed of in an appropriate landfill.

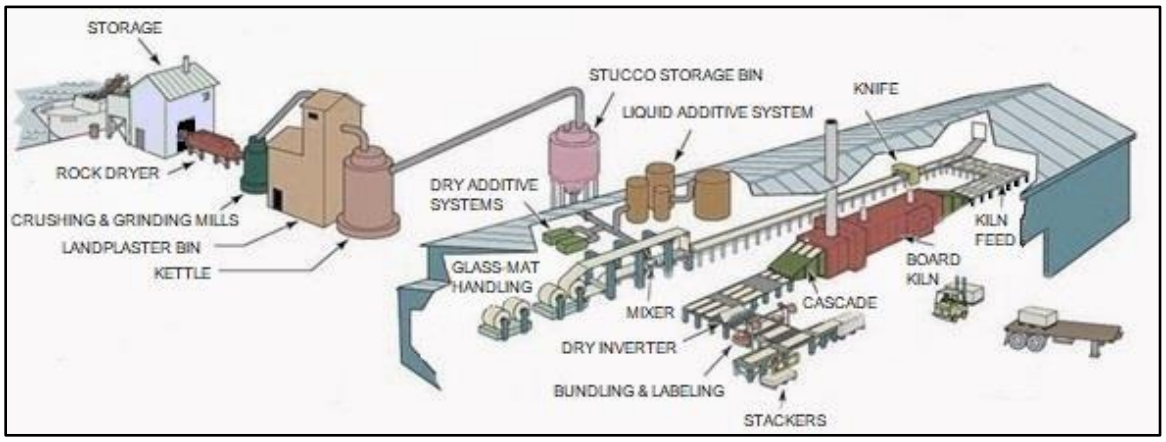


Figure 1: Process diagram for the production of glass mat gypsum panel products

1.7 Environment and Health During Manufacturing

USG and CGC have led the building sector's effort in developing and supplying sustainable construction materials. Today, sustainability is integrated into the design and manufacture of every wall, ceiling, and flooring product. As both a producer and a buyer of raw materials, we have a responsibility to extensively review and select each material we use. Each decision we make is based on careful consideration of environmental and safety effects over time. Raw materials used in our products are carefully selected and go through a screening procedure. Incoming raw materials are tested for contaminants by an internal lab and third-party labs for consideration of use and worker, environmental, and end-user exposure. This due diligence helps to ensure our products are safe to handle in our manufacturing plants and on job sites while having minimal impact on occupant health and indoor and outdoor environments.

1.8 Packaging

A quantity of units are collected and placed on sleutters (i.e., spacers) for easy pick-up by fork lift trucks.

1.9 Distribution (A4)

The following default distances for truck transport were taken from the PCR and used in this analysis.

Product transport from the point of manufacture to building site	Mode: Diesel-powered truck/trailer Distance: 800 km (497 miles)
Product transport from building site to waste processing	Mode: Diesel-powered truck/trailer Distance: 161 km (100 miles)

Name	Value	Unit
Fuel Type	Diesel	
Liters of fuel	2.23	l/100 km/MSF
Vehicle Type	Diesel Truck	
Transport Distance	961 km (597 miles)	km (miles)
Capacity utilization	100 (weight limited)	%
Gross density of products transported	700	kg/m^3
Weight of products transported	0.824	kg/sf
Volume of products transported	1.18E-03	m^3/sf
Capacity utilization volume factor	1	-

1.10 Product Installation (A5)

Standard rules for installing glass mat roof board products are available online at usg.com and cgcinc.com.

As dictated by the PCR, "the default on-site installation waste" scenario for gypsum panels was 7% on a surface area basis of the panel product. A 7% installation waste factor was adhered to in this LCA analysis. No ancillary inputs nor any energy or water were required for installation or operation of the construction site or building.

1.11 Reference Service Life

A default RSL of 40 years was assumed for the product. An assumed Estimated Service Life (ESL) of 75 years was used for the building life. This RSL depends on the proper transport, handling, installation and use of this product. Procedures covering these stages are available at usg.com.

1.12 Use (B1)

Standard rules for installing glass mat roof board products are available online at usg.com and cgcinc.com.

1.13 Maintenance (B2), Repair (B3) and Refurbishment (B5)

Roof panels are assumed to not need maintenance, repair or refurbishment during the product RSL over the building ESL.

1.14 Environment and Health During Use Stage

Under normal conditions of intended use, this material does not pose a risk to the environment or occupant health. Securock® Brand UltraLight Coated and Uncoated Glass-Mat Roof Board are not qualified as a "Low Emitting" material per California Department of Public Health CDPH/EHLB/Standard Method (CA Section 01350) for school classroom, and private office modeling scenarios, and do not meet USGBC's LEED® v4 emission requirements.

1.13 Replacement (B4)

Using a default RSL of 40 years, one replacement of product is expected during the building ESL of 75 years. This means the replacement cycle shall be reported as 0.9. This amount of replacement product including distribution and installation waste was included in the LCA study.

Name	Value	Unit
Reference Service Life	40	Years
Replacement cycle	0.875	(ESL/RSL)-1
Energy input, specified by activity, type and amount	N/A	kWh
Ancillary materials	N/A	m^3
Replacement of worn parts	N/A	kg
Direct emission to ambient air, soil, and water	See results	kg
Further assumptions for scenario development	N/A	kg

1.14 End-of-Life (C1-C4)

Currently, glass mat gypsum panel products are typically disposed of in a building and construction landfill. In certain areas, USG has agreements with third-party gypsum waste recyclers who collect gypsum construction waste at jobsites for recycling and then transport this post-consumer gypsum raw material to specific USG manufacturing plants for use in the manufacturing of new gypsum panel products. There are several alternative options to landfilling such as the use of reground gypsum panels for soil amendment applications. Contact your local EPA for reuses rules and regulations.

Name		Value	Unit
Assumption for scenario development	All material at EOL to landfill		kg
Collection process (specified by type)	Collected separately	Data not available	kg
	Collected with mixed construction waste	Data not available	kg
Recovery (specified by type)	Reuse	0	kg
	Recycling	0	kg
	Landfill	Declared unit weight	kg
	Incineration	0	kg
	Incineration with energy recovery	N/A	kg
	Energy Conversion (efficiency rate)	N/A	
Disposal	Product or material for final disposition	Mass/functional unit	kg

2. LCA Calculation Rules 2.1 Functional Unit

The functional unit for this LCA study is 1 m^2 of product. This functional unit is consistent with the PCR.

Table 3: Functional unit

Gypsum Board	Value and Units
Functional Unit	1 m^2
Declared Density	8.79 kg/m^2 (1.80 lbs./sf)
Declared Thickness	12.7 mm (0.50 inches)

Convert from	***To***	***Multiply by***
square meter (m^2)	Square foot (ft^2)	10.76391
kilogram (kg)	Pound (lb)	2.204622
Mega joule (MJ)	British Thermal Unit (BTU)	947.8170
degree Celsius (°C)	degree Fahrenheit (°F)	t/°C = (t/°F - 32)/1.8
cubic meter (m3)	cubic foot (ft3)	35.31466

2.2 System Boundary

This cradle-to-grave (A1-C4) LCA study covers all the production steps from raw materials extracted from the earth (the cradle) to pallets of glass mat panel product ready to be shipped from the plant as well as distribution, installation, use and end of life stages (the grave).

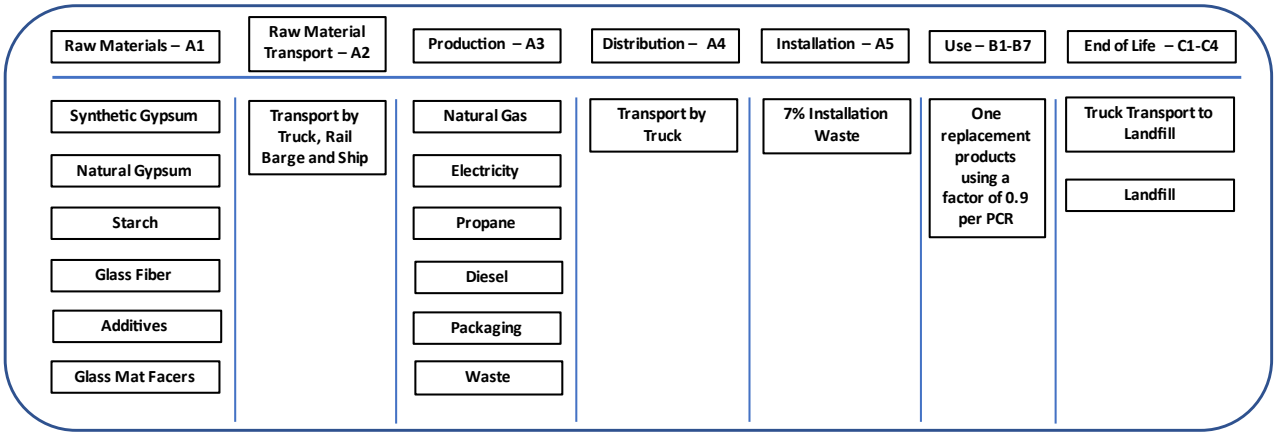


Figure 2: Specific processes covered by this EPD by life cycle stage

2.3 Estimates and Assumptions

1/2 in. (12.7 mm) Securock® Brand UltraLight Coated and Uncoated Glass-Mat Roof Board raw material and energy inputs are specific to the specific products produced at the relevant gypsum panel manufacturing plant.

2.4 Cut-off Criteria

The cut-off criteria for input flows to be considered within each system boundary were as follows:

Mass – if a flow is less than 1% of the cumulative mass of the model flows it may be excluded, providing its environmental relevance is minor.

Energy – if a flow is less than 1% of the cumulative energy of the system model it may be excluded, providing its environmental relevance is minor.

The sum of the excluded material flows must not exceed 5% of mass, energy, or environmental relevance.

2.5 Background Data

All background was sourced from critically reviewed GaBi databases.

2.6 Data Requirements and Data Sources

Manufacturer specific data was obtained from each relevant gypsum panel manufacturing plant in the United States. The LCA model was created using GaBi ts software. Specific comments related to data quality requirements cited in ISO 14025 Section 4.2.3.6.2 include the following:

Temporal: In the case of 1/2 in. (12.7 mm) Securock® Brand UltraLight Coated and Uncoated Glass-Mat Roof Board, the LCI data was collected from each relevant gypsum panel manufacturing plant for the 2019 calendar year.

Geographical: Where possible, all processes were chosen as being representative of U.S. manufacturing processes.

Technical: The data selected for this study is specific to the technology used in the preparation of the raw materials.

Precision: The raw material usage amounts were derived from plant quality data on finished products and product formulas.

Completeness: Virtually all the significant raw material flows (> 99%) used for panel production has been modeled. The exception consists of transportation of the coating raw materials; the effect of which was determined to be less than 1% of the total.

Representative: Where possible all the data sets were selected to be representative of U.S.-based production, are less than 10 years in age and are representative of the technology being employed.

Consistency: All the manufacturing processes were modeled in a consistent manner throughout this study in accordance with the goal and scope definitions.

Reproducibility: The information contained in this study, including raw material, energy and transportation distance inputs, have been fully documented in the LCA report.

Sources of Data: The sources for the processes used in this study have been fully provided in the LCA report and are representative of the material and energy sources used in actual production.

Uncertainty: The relative uncertainty associated with this study has been minimized. No significant assumptions have been made.

2.7 Period Under Review

All raw material and energy inputs are for the 2019 calendar year.

2.8 Allocation

The LCI data was collected for the gypsum panel manufacturing plant for the 2019 production year. Raw material and energy inputs were allocated to 1/2 in. (12.7 mm) Securock® Brand UltraLight Coated and Uncoated Glass-Mat Roof Board based on the mass of those panels.

2.9 Comparability

Any comparison of EPDs shall be subject to the requirements of ISO 14025:2006 section 6.7.2, ISO 21930:2017 section 5.5, and UL Part B PCR for Roof Cover Protection Board.

3. Life Cycle Assessment Results

	PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
	Raw material supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use Stage	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction	Transport	Waste Processing	Disposal	Reuse, Recovery, Recycling Potential
EPD types	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Cradle to gate with options	Required			Required		Excluded			Required	Excluded			Required				Optional

Figure 3: Description of the System Boundary Modules

3.1 Life Cycle Impact Assessment Results

The Life Cycle Impact Assessment Results presented below are mass-averaged results based on the total mass of the 1/2 in. (12.7 mm) Securock® Brand UltraLight Coated and Uncoated Glass-Mat Roof Board product produced at the relevant production plants.

Tables 4 & 5: LCA Results using TRACI 2.1 Impacts

Mass-weighted Average of Environmental LCA Results for 1 Square Foot of 1/2 in. (12.7 mm) Securock® Brand UltraLight Coated and Uncoated Glass-Mat Roof Board (A1-C4)

		Stage					
Impact Assessment Method: TRACI 2.1		A1-A3	A4	A5	B1-B7	C1-C4	Total A1-C4
Environmental Impact Category	Units	Impact	Impact	Impact	Impact	Impact	Impact
Global warming	kg CO2 eq.	2.21E-01	3.90E-02	1.98E-02	2.48E-01	8.23E-02	6.10E-01
Ozone Depletion Potential (ODP)	kg CFC 11-eq.	1.51E-10	7.78E-18	1.14E-11	1.46E-10	2.26E-16	3.09E-10
Acidification Potential	kg SO2 eq.	5.40E-04	5.90E-05	5.43E-05	5.75E-04	3.39E-04	1.57E-03
Eutrophication Potential (EP)	kg N eq.	3.79E-05	9.47E-06	3.50E-06	4.52E-05	2.20E-05	1.18E-04
Photochemical Ozone Creation Potential (POCP)	kg O3-Equiv.	6.46E-03	1.33E-03	7.36E-04	7.45E-03	6.29E-03	2.23E-02
Abiotic Depletion Potential (ADP) - fossil fuels	MJ surplus energy	4.68E-01	7.31E-02	3.85E-02	5.19E-01	1.63E-01	1.26E+00

Mass-weighted Average of Environmental LCA Results for 1 Square Meter of 1/2 in. (12.7 mm) Securock® Brand UltraLight Coated and Uncoated Glass-Mat Roof Board (A1-C4)

		Stage					
Impact Assessment Method: TRACI 2.1		A1-A3	A4	A5	B1-B7	C1-C4	Total A1-C4
Environmental Impact Category	Units	Impact	Impact	Impact	Impact	Impact	Impact
Global warming	kg CO2 eq.	2.37E+00	4.20E-01	2.13E-01	2.67E+00	8.86E-01	6.57E+00
Ozone Depletion Potential (ODP)	kg CFC 11-eq.	1.63E-09	8.38E-17	1.22E-10	1.58E-09	2.43E-15	3.33E-09
Acidification Potential	kg SO2 eq.	5.81E-03	6.35E-04	5.84E-04	6.19E-03	3.65E-03	1.69E-02
Eutrophication Potential (EP)	kg N eq.	4.08E-04	1.02E-04	3.77E-05	4.87E-04	2.37E-04	1.27E-03
Photochemical Ozone Creation Potential (POCP)	kg O3-Equiv.	6.95E-02	1.43E-02	7.92E-03	8.02E-02	6.78E-02	2.40E-01
Abiotic Depletion Potential (ADP) - fossil fuels	MJ surplus energy	5.04E+00	7.87E-01	4.15E-01	5.59E+00	1.76E+00	1.36E+01

Tables 6 & 7: LCA Results for Resources Usages

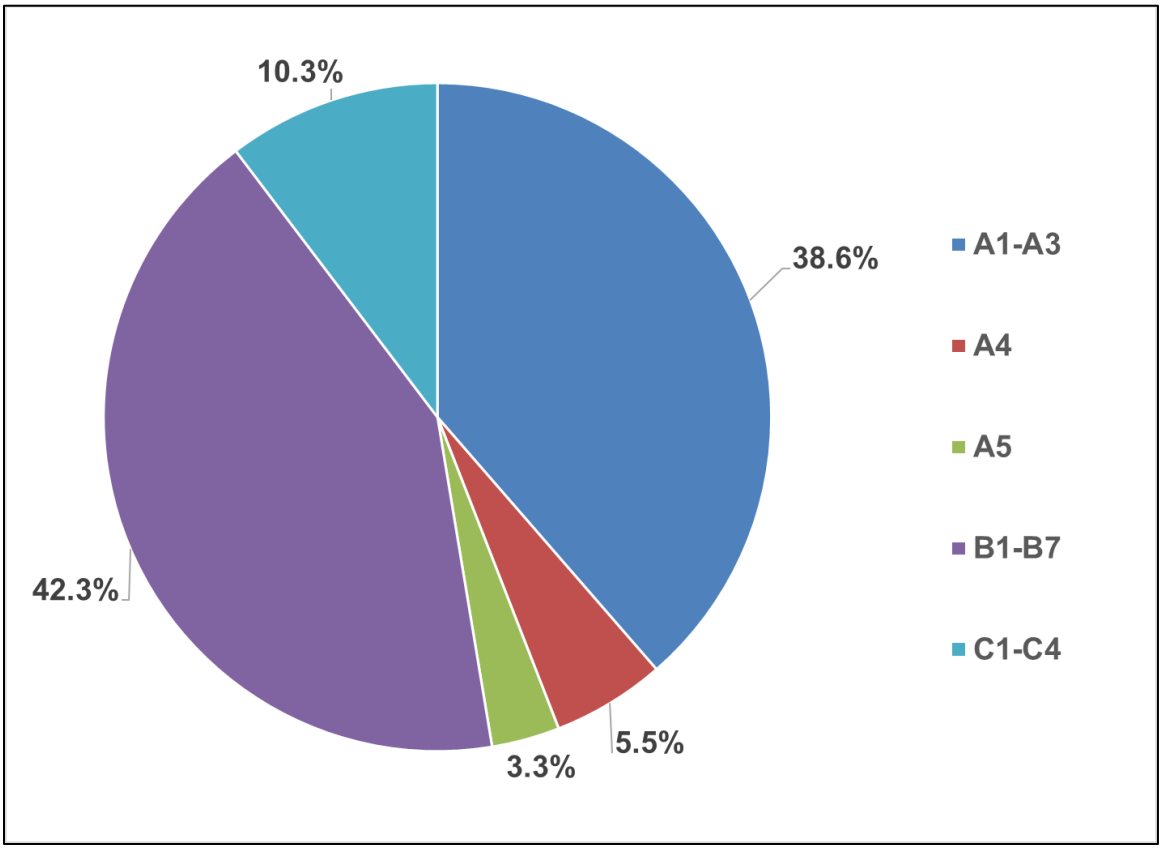
Mass-weighted Average of Resource and Waste Flows for 1 Square Meter of 1/2 in. (12.7 mm) Securock® Brand UltraLight Coated and Uncoated Glass-Mat Roof Board (A1-C4)							
	Units	Stage					
Use of Primary Resources		A1-A3	A4	A5	B1-B7	C1-C4	Total A1-C4
Renewable primary resources used as an energy carrier (RPRE)	MJ, NCV	3.43E-02	2.11E-03	3.12E-03	3.51E-02	8.84E-03	8.35E-02
Renewable primary resources with energy content used as material (RPRM)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.77E-05	1.77E-05
Non-renewable primary resources used as an energy carrier (NRPRE)	MJ, NCV	3.78E-01	5.13E-02	3.21E-02	4.12E-01	1.18E-01	9.92E-01
Non-renewable primary resources with energy content used as material (NRPRM)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.77E-05	1.77E-05
Secondary material, secondary fuel and recovered energy		A1-A3	A4	A5	B1-B7	C1-C4	Total A1-C4
Secondary Material (SM)	kg	4.08E-04	0.00E+00	1.22E-04	3.95E-04	0.00E+00	9.25E-04
Renewable Secondary Fuel (RSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable Secondary Fuel (NRSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable Energy (RE)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Consumption of Fresh Water	m3	1.17E-04	9.03E-06	9.59E-06	1.21E-04	1.72E-05	2.74E-04
Additional inventory parameters for transparency		A1-A3	A4	A5	B1-B7	C1-C4	Total A1-C4
Removals and emissions associated with biogenic carbon content of the bio-based product	kg CO2-eq.	1.12E-03	0.00E+00	8.41E-05	1.08E-03	-1.85E-03	4.37E-04
Emission from calcination and uptake from carbonation	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Removals and emissions associated with biogenic carbon content of the bio-based packaging	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Emissions from land use change	kg CO2-eq.	2.74E-06	3.50E-06	7.48E-07	5.80E-06	5.66E-06	1.84E-05
Emissions from combustion of waste from renewable sources used in production processes	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Emissions from combustion of waste from non-renewable sources used in production processes	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indicators describing waste		A1-A3	A4	A5	B1-B7	C1-C4	Total A1-C4
Hazardous waste disposed	kg	1.33E-08	4.28E-12	1.03E-09	1.29E-08	1.09E-11	2.73E-08
Non-hazardous waste disposed	kg	1.01E-03	4.71E-06	9.91E-03	9.80E-04	1.41E-01	1.53E-01
High-level radioactive waste	kg	7.65E-06	1.46E-07	6.39E-07	7.53E-06	8.55E-07	1.68E-05
Intermediate and low-level waste	kg	N/A	N/A	N/A	N/A	N/A	N/A
Assignments of output flows at the end-of-life		A1-A3	A4	A5	B1-B7	C1-C4	Total A1-C4
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (MR)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Recovered energy exported (EE)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Mass-weighted Average of Resource and Waste Flows for 1 Square Foot of 1/2 in. (12.7 mm) Securock® Brand UltraLight Coated and Uncoated Glass-Mat Roof Board (A1-C4)							
	Units	Stage					
Use of Primary Resources		A1-A3	A4	A5	B1-B7	C1-C4	Total A1-C4
Renewable primary resources used as an energy carrier (RPRE)	MJ, NCV	3.69E-01	2.27E-02	3.36E-02	3.78E-01	9.51E-02	8.98E-01
Renewable primary resources with energy content used as material (RPRM)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E-04	1.90E-04
Non-renewable primary resources used as an energy carrier (NRPRE)	MJ, NCV	4.07E+00	5.52E-01	3.45E-01	4.44E+00	1.27E+00	1.07E+01
Non-renewable primary resources with energy content used as material (NRPRM)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E-04	1.90E-04
Secondary material, secondary fuel and recovered energy		A1-A3	A4	A5	B1-B7	C1-C4	Total A1-C4
Secondary Material (SM)	kg	4.39E-03	0.00E+00	1.32E-03	4.25E-03	0.00E+00	9.96E-03
Renewable Secondary Fuel (RSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable Secondary Fuel (NRSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable Energy (RE)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Consumption of Fresh Water	m3	1.26E-03	9.71E-05	1.03E-04	1.30E-03	1.85E-04	2.95E-03
Additional inventory parameters for transparency		A1-A3	A4	A5	B1-B7	C1-C4	Total A1-C4
Removals and emissions associated with biogenic carbon content of the bio-based product	kg CO2-eq.	1.20E-02	0.00E+00	9.05E-04	1.17E-02	-1.99E-02	4.71E-03
Emission from calcination and uptake from carbonation	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Removals and emissions associated with biogenic carbon content of the bio-based packaging	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Emissions from land use change	kg CO2-eq.	2.95E-05	3.76E-05	8.05E-06	6.24E-05	6.09E-05	1.98E-04
Emissions from combustion of waste from renewable sources used in production processes	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Emissions from combustion of waste from non-renewable sources used in production processes	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indicators describing waste		A1-A3	A4	A5	B1-B7	C1-C4	Total A1-C4
Hazardous waste disposed	kg	1.44E-07	4.61E-11	1.11E-08	1.39E-07	1.18E-10	2.94E-07
Non-hazardous waste disposed	kg	1.08E-02	5.07E-05	1.07E-01	1.05E-02	1.51E+00	1.64E+00
High-level radioactive waste	kg	8.23E-05	1.57E-06	6.87E-06	8.10E-05	9.20E-06	1.81E-04
Intermediate and low-level waste	kg	N/A	N/A	N/A	N/A	N/A	N/A
Assignments of output flows at the end-of-life		A1-A3	A4	A5	B1-B7	C1-C4	Total A1-C4
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (MR)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Recovered energy exported (EE)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

4. LCA Interpretation

The figure below graphically depicts the relative contributions for the cradle-to-grave production of 1/2 in. (12.7 mm) Securock® Brand UltraLight Coated and Uncoated Glass-Mat Roof Board. The dominant source of greenhouse gases are generated during the panel drying process. This analysis is typical for all gypsum panel manufacturing plants covered in this study. Future reductions in Global Warming Potential should be directed at reducing the amount of water entering the dryer.

Figure 4: Process Dominance Analysis for the Production of 1/2 in. (12.7 mm) Securock® Brand UltraLight Coated and Uncoated Glass-Mat Roof Board



5. References

LCA Report

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