Environmental Product Declaration

USG SECUROCK® BRAND GYPSUM-FIBER ROOF BOARD

Gypsum, OH

Features and Benefits

- High-performance roof board for use in low-slope commercial roofing systems
- Exceptional bond and low absorption in adhered systems
- Moisture- and mold-resistant
- Excellent wind-uplift performance
- Living Building Challenge™ Red List Free Declare Label
- Achieves GREENGUARD Gold Certification and qualifies as low VOC emitting material (meets CDPH 01350)
- USGBC® LEED® v4/4.1-may assist in achieving additional credits

Environmental Impacts (A1-A3) Cradle-to-Gate
Functional unit – 1 square meter (10.8 square feet)

	1/4"	3/8"	1/2"	5/8"
Global Warming Potential-Total (kg CO_2 eq.)[1]	1.32E+00	1.62E+00	2.12E+00	2.69E+00
Ozone Depletion Potential (kg CFC 11 eq.)[2]	3.53E-11	4.41E-11	5.31E-11	6.78E-11
Acidification Potential (kg SO_2 eq.)[2]	7.17E-03	9.26E-03	1.13E-02	1.42E-02
Eutrophication Potential (kg N eq.)[2]	1.66E-03	2.12E-03	2.62E-03	3.30E-03
Photochemical Ozone Creation Potential (kg O_3 eq.)[2]	6.02E-02	7.67E-02	9.49E-02	1.19E-01
Abiotic Depletion Potential- fossil fuels (MJ, LHV)[3]	3.24E+01	4.06E+01	5.13E+01	6.51E+01

[1]IPCC 2021 (AR6)
[2]TRACI 2.2
[3]CML August 2016

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Gypsum, OH

This declaration is an Environmental Product Declaration (EPD) in accordance with ISO 14025:2006 and ISO 21930:2017. 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.

USG Corporation has sole ownership, liability, and responsibility for this EPD. The owner of the declaration shall be liable for the underlying information and evidence; ASTM, or its affiliates, shall not be liable with respect to manufacturer information, life cycle assessment data, and evidence.

DECLARATION NUMBER	EPD 993
EPD DATA SPECIFICITY	Product specific, facility specific EPD
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
EPD TYPE	Type III Declaration per ISO 14025:2006
DECLARED PRODUCT	USG Securock® Brand Gypsum-Fiber Roof Board
EPD SCOPE	Cradle-to-gate with options, A1-A3, A4, A5, B4, C2, C4
DATE OF ISSUE PERIOD OF VALIDITY	06/05/25 5 Years
MARKETS OF APPLICABILITY	North America
CORE STANDARD	ISO 21930:2017
CORE PCR	Product Category Rules for Building-Related Products and Services Part A: Life Cycle Assessment Calculation Rules and Report Requirements, UL Environment Standard 10010, Version 4.0, published March 28, 2022 www.ul.com/businesses/environment
SUB-CATEGORY PCR	Product Category Rules for Building-Related Products and Services Part B: Roof Cover Protection Board EPD Requirements, UL Environment Standard 10010-36, Version 1.0, published Nov. 2, 2021 www.ul.com/businesses/environment
SUB-CATEGORY PCR REVIEW	Independent Panel Review
ACLCA PCR OPEN STANDARD CONFORMANCE	Transparency
ACLCA PCR OPEN STANDARD VERSION	Version 1.0 | May 25, 2022
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. Description of Organization

USG is the leader in manufacturing high-quality building materials designed to drive efficiency and innovation across the construction industry worldwide. We help our global customers more easily, safely, and affordably create sustainable and accessible spaces for all. Our wall, ceiling, joint treatment, flooring, sheathing, and roof products are used to build many of the world's most iconic structures as well as airports, hospitals, schools, offices, and the places people call home.

2. Product System Documentation

2.1 Product Description and Product Identification

Roof cover boards are part of a roof system (inclusive of membrane, insulation, and edge finishing materials) that provides a weatherproof barrier and are positioned under the weathering surface/waterproof layer. Roof cover boards add strength, protection, and impact resistance to the roof system. They can enhance the roof's performance in a variety of ways including limiting external fire spread, reducing wind uplift, and contributing to the thermal and vapor barrier. Roof cover boards can be comprised of a variety of materials including but not limited to, plywood, glass-mat gypsum, cement, polyiso, urethane foams (high density) composite materials, or other suitable materials.

USG Securock® Brand Gypsum-Fiber Roof Board is a high-performance roof board for use in low-slope roofing systems. Its unique fiber-reinforced, uniform composition gives the panel strength and water resistance through to the core. USG Securock® Brand Gypsum-Fiber Roof Board provides exceptional bond and low absorption in adhered systems, and with uniform composition, achieves high wind-uplift ratings with no risk of facer delamination. USG Securock® Brand Gypsum-Fiber Roof Board combines superior performance with sustainable design for all types of built-up roofing systems and most fluid applied, spray foam, metal, and any polyester reinforced single ply or modified bitumen membrane systems.

USG Securock® Brand Gypsum-Fiber Roof Board is manufactured at the USG Gypsum, OH plant.

USG Securock® Brand Gypsum-Fiber Roof Board is nominally 1/4" (6.4 mm), 3/8" (9.5 mm), 1/2" (12.7 mm), or 5/8" (15.9 mm) thick. The panel size is 4 ft. × 4 ft. (1,220 mm × 1,220 mm) or 4 ft. × 8 ft. (1,220 mm × 2,440 mm).

USG Securock® Brand Gypsum-Fiber Roof Board is fiber-reinforced gypsum panels and meets ASTM standard C1278 *Specification for Fiber Reinforced Gypsum Panel*. The panels are UL Classified (Type FRX-G) as to Surface Burning Characteristics in accordance with ASTM E84 and CAN/ULC-S102 (Flame Spread 5 and Smoke Developed 0). Panels of all thicknesses meet Class A in accordance with UL790 and CAN/ULC-S107. 5/8 in. product meets requirements of Type X per ASTM C1278 and may be used in P series designs as a thermal barrier.

USG Securock® Brand Gypsum-Fiber Roof Board is engineered to provide superior wind-uplift performance for a wide variety of roof assemblies. It meets Factory Mutual Global (FMG) Class 1 and complies with requirements of FM 4450 and FM 4470.

The classification number according to the UNSPSC classification system (see https://usa.databasesets.com/) is 30151500.

2.2 Designated Application

Refer to roof system manufacturer's written instructions, local code requirements, and Factory Mutual Global (FMG) and/or Underwriters Laboratories (UL) requirements for proper installation techniques.

Use fasteners specified in accordance with the above requirements. Install approved fasteners with plates into the USG Securock® Brand Gypsum-Fiber Roof Board, flush with the surface. Fasteners should be installed in strict compliance with roof system manufacturer's installation recommendations and FMG Loss Prevention Data Sheet 1-29. A qualified architect/engineer should review and approve calculations, framing, and fastener spacing for all projects.

For vertical parapet applications, only 1/2" or 5/8" panels should be used. The maximum framing spacing is 24" o.c. The panels are cut and trimmed with a utility knife or hand saw to minimize dust levels.

2.3 Product Technical Data

Table 1: Performance Data

Properties	Unit of Measure	ASTM Test Method	1/4"	3/8"	1/2"	5/8"
Weight	psf (kg/m^2)	C473	1.57 (7.7)	1.96 (9.6)	2.47 (12.1)	3.20 (15.6)
Flexural strength	lbf	C473	>40	>70	>110	>161
Compressive strength	psi, nominal	N/A	1,800	1,800	1,800	1,800
Flute spanabilty	in	E661	2-5/8"	5"	8"	10"
Permeance	perms	E96	30	26	26	24
R value	°F-ft^2-h/Btu	C518	0.2	0.3	0.5	0.6
Coefficient of thermal expansion	Inches/inch/°F	E831	8.0×10^{-6}	8.0×10^{-6}	8.0×10^{-6}	8.0×10^{-6}
Linear variation with change in moisture	Inches/inch/°RH	D1037	8.0×10^{-6}	8.0×10^{-6}	8.0×10^{-6}	8.0×10^{-6}
Water absorption	%	C473	<10	<10	<10	<10
Surface water absorption, nominal	grams	C473	1.6	1.6	1.6	1.6
Molde resistance		D3273	10 (no growth)	10 (no growth)	10 (no growth)	10 (no growth)
Bending radius	ft	N/A	25	25	25	30

2.4 Placing on the Market/Application Rules

USG Securock® Brand Gypsum-Fiber Roof Board is engineered to perform within a properly designed roof system. The use of USG Securock® Gypsum-Fiber Roof Board as a roof component is the responsibility of the design professional.

Consult roof manufacturers for specific instructions on the application of their products to USG Securock® Brand Gypsum-Fiber Roof Board. For fully adhered fiberglass reinforced membranes, consult the membrane manufacturer.

2.5 Delivery Status

USG Securock® Brand Gypsum-Fiber Roof Board typically come in 4 ft. × 4 ft. (1,220 mm × 1,220 mm) or 4 ft. × 8 ft. (1,220 mm × 2,440 mm). The panels are protected by cardboard edge protectors, strapped by plastic banding, put on dunnages (made the same way as the product), and shipped in packaging units shown below.

Table 2: Product Data: Sizes and Packaging

Size (thickness × width × length)	Units (pcs)
1/4 in. x 4 ft. x 4 ft. (6.4 mm x 1,220 mm x 1,220 mm)	100
1/4 in. x 4 ft. x 8 ft. (6.4 mm x 1,220 mm x 2,440 mm)	50
3/8 in. x 4 ft. x 4 ft. (9.5 mm x 1,220 mm x 1,220 mm)	80
3/8 in. x 4 ft. x 8 ft. (9.5 mm x 1,220 mm x 2,440 mm)	40
1/2 in. x 4 ft. x 4 ft. (10.7 mm x 1,220 mm x 1,220 mm)	60
1/2 in. x 4 ft. x 8 ft. (10.7 mm x 1,220 mm x 2,440 mm)	30
5/8 in. x 4 ft. x 4 ft. (15.9 mm x 1,220 mm x 1,220 mm)	48
5/8 in. x 4 ft. x 8 ft. (15.9 mm x 1,220 mm x 2,440 mm)	24

2.6 Product Composition

Table 3: Product Formula

Material	Value
Calcium sulfate dihydrate	>85%
Cellulose fiber	<10%
Additives	<5%
Total	**100%**

2.7 Product Manufacturing

The manufacturing of Securock® Brand Gypsum-Fiber Roof Board starts with the pulping of waste paper to turn it into cellulose fibers. The cellulose fibers are blended with other ingredients in a large mixing tank. The mixed slurry travels onto a mesh screen, allowing water to drain. The drained water is treated at the plant and recirculated back into the process. The de-watered slurry is transferred to a forming machine, where the material is pressed to achieve the required caliper. The formed sheets are conveyed to a dryer where excess water is removed. The board is cut to its final size, with cardboard edge protectors applied, secured with plastic banding, and put on dunnages (made the same way as the panels). All waste production material (trimmed and off-spec board) is used as reclaim and fed back into the process.

2.8 Environment and Health During Manufacturing

USG and CGC lead the building sector in developing and supplying sustainable construction materials. Today, sustainability is integrated into the design and manufacturing of wall, ceiling, and flooring products. In the manufacturing of our products, we review and select each material with consideration of environmental protection, health, and safety. Raw materials used in our products are carefully selected and go through a qualification procedure. Raw materials are tested for contaminants by an internal lab and third-party labs.

2.9 Packaging

USG Securock® Brand Gypsum-Fiber Roof Board are packaged with cardboard edge protectors, strapped with plastic banding, and put on dunnages. The production and transportation of these packaging materials were modeled in this LCA study.

2.10 Conditions of Use

Keep USG Securock® Brand Gypsum-Fiber Roof Board panels dry before, during, and after installation. USG Securock® Brand Gypsum-Fiber Roof Board should not be installed during rain, heavy fog, and any other conditions that deposit moisture on the surface of the board. Apply only as much USG Securock® Brand Gypsum-Fiber Roof Board that can be covered by final roof membrane system in the same day. Avoid exposure to moisture from leaks or condensation.

USG Securock® Brand Gypsum-Fiber Roof Board should be stored flat and off the ground with protection from the weather. If stored outdoors, a breathable waterproof covering should be used.

When applying solvent-based adhesives or primers, allow sufficient time for the solvent to evaporate to avoid damage to roof components.

USG recommends a maximum asphalt application temperature for Type III or Type IV asphalt of 455°F when using USG Securock® Brand Gypsum-Fiber Roof Board. Application temperatures above these recommended temperatures may adversely affect roof system performance.

2.11 Environment and Health During Use Stage

This product is not expected to produce any unusual hazards during normal use.

2.12 Reference Service Life

The reference service life (RSL) is 40 years according to the PCR. The building estimated service life (ESL) is 75 years in accordance with ASHRAE 189.1 (2020, Section 9.5.1). The number of replacements of product expected during the building ESL of 75 years is reported as 0.9. The replacement products and ancillary materials have been incorporated into the LCA study.

2.13 Re-Use Phase

USG Securock® Brand Gypsum-Fiber Roof Board (including packaging) cannot be reused at the end of life.

2.14 End-of-Life Disposal

USG Securock® Brand Gypsum-Fiber Roof Board (including packaging) is put in landfill at the end of life.

3. LCA Calculation Methodology

3.1 Declared Unit

The functional unit is defined as 1 square meter (10.8 square feet) of installed roof board. 7% installation waste is included in the modeling according to the PCR.

Table 5: Functional Unit

Name	1/4"	3/8"	1/2"	5/8"
Functional Unit	1 m^2 (10.8 ft^2)	1 m^2 (10.8 ft^2)	1 m^2 (10.8 ft^2)	1 m^2 (10.8 ft^2)
Declared Thickness	0.25 in (6.4 mm)	0.375 in (9.5 mm)	0.5 in (12.7 mm)	0.625 in (15.9 mm)
Density	72.5 pcf (1,160 kg/m^3)	62.7 pcf (1,005 kg/m^3)	60.0 pcf (960 kg/m^3)	61.4 pcf (985 kg/m^3)
Surface weight per declared unit	1.57 lb/ft^2 (7.7 kg/m^2)	1.96 lb/ft^2 (9.6 kg/m^2)	2.47 lb/ft^2 (12.1 kg/m^2)	3.20 lb/ft^2 (15.6 kg/m^2)

4. System Boundary

This EPD represents a “cradle-to-gate” with options LCA analysis for USG Securock® Brand Gypsum-Fiber Roof Board. It covers the production stage (A1 to A3), transport to jobsite (A4), installation (A5), replacement (B4), and end-of-life (C2 transport & C4 disposal).

A1 (raw material supply) includes the extraction and processing of raw materials for the roof cover board.

A2 (transport to factory) includes the transport of raw materials to the manufacturing facility.

A3 (manufacturing) includes the manufacturing of roof cover board and packaging materials. Waste from production is put back into the manufacturing process.

A4 (transport to jobsite) includes the transport of products and packaging to the jobsite. The actual transportation modes & the actual average distances are used in the analysis.

A5 (installation) includes 7% wastage of products covering the production processes (A1-A3) and transport to site (A4) to account for the material lost from wastage of products. It also includes the manufacturing and transport of the fasteners. For roof board installation, fasteners are always used together with plates, and both are modeled in this study. Typical fastener (with plate) and fastening pattern are used in the analysis. Impacts from the installation of the product are assumed negligible with hand tools used for the installation. Transportation of the installation waste (including the packaging) to landfill is included in this phase, and the distance is assumed to be 50 miles. Life cycle inventory analysis (LCIA) related to landfill is included in the study.

According to the PCR, use phase modules B1 (use), B2 (maintenance), B3 (repair), B5 (refurbishment), B6 (operational energy use), B7 (operational water use) are assumed to have zero impact for this product category.

B4 (replacement) includes the materials and energy required for the replacement of the product over the 75-year ESL. It also includes the transportation of the demolished board and the installation waste (including the packaging) to landfill, and the distance is assumed to be 50 miles. Life cycle inventory analysis (LCIA) related to landfill is modeled the same way as in A5.

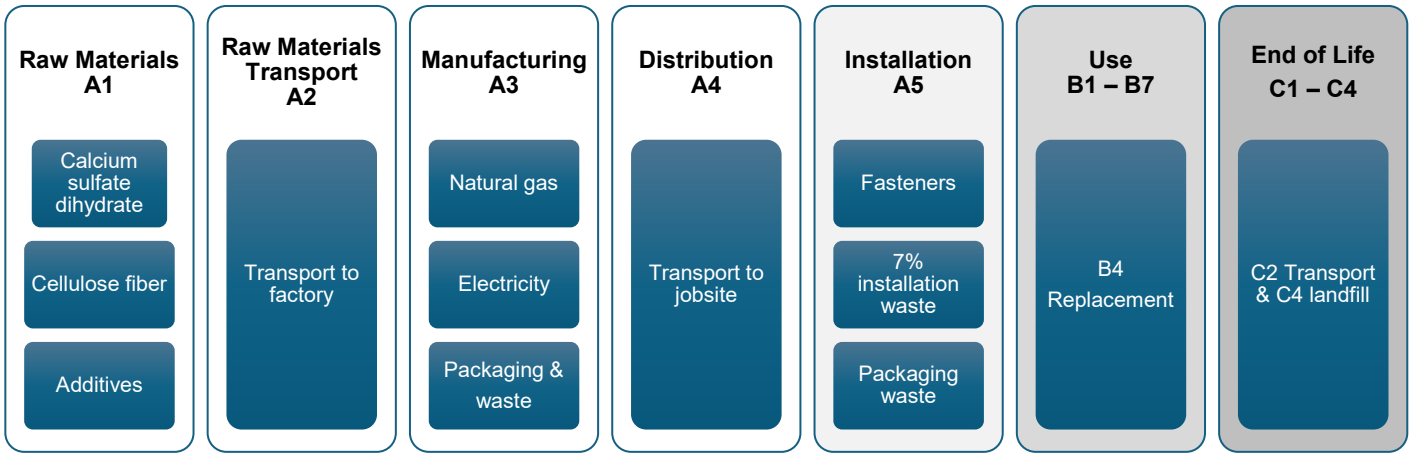
C1 (deconstruction) is conducted with hand tools and has zero impact.

C2 (transport to waste processing) includes the transportation of the demolished board to landfill at the end of life, and the distance is assumed to be 50 miles.

C4 models the landfill of the demolished board at the end of life, the same way as in A5.

The infrastructure/capital goods are excluded for upstream, core, and downstream processes in the LCA report and in the EPD. Heating and cooling of the manufacturing facility are included in the analysis.

Figure 1: Specific Processes Covered by this EPD by Life Cycle Stage



4.1 Estimates and Assumptions

Primary energy and raw material input data were collected from the Gypsum, OH plant for the 2024 calendar year. Data collection of raw material inputs was aided by an extensive computer monitoring system which tracked product formulas by product type. Energy inputs were obtained from utility bills and allocated by mass. Additional data limitations include the use of proxy processes rather than actual supplier generated primary data. This would include such processes as gypsum (calcium sulfate dihydrate), which is representative of gypsum but may not necessarily be representative of USG's particular supplier. In addition, the data is limited in that the primary data was collected during the 2024 year, and changes in operations may increase/decrease impacts in the future. Other data limitations include the use of secondary data sets instead of primary data for upstream and downstream processes, local impacts vs. global impacts, possible impacts vs. actual impacts, inherent uncertainty in the data sets, accuracy and precision of impact assessment methodology, etc.

4.2 Cut-off Criteria

The requirements for the exclusion of inputs and outputs (cut-off rules) shall follow the guidance in ISO 21930 Section 7.1.8.

4.3 Background Data

All background data was sourced from critically reviewed LCA for Experts databases from Sphera.

4.4 Data Requirements and Data Sources

The LCA model was created using LCA for Experts software (version 10.9.1.10) from Sphera. Specific comments related to data quality requirements cited in ISO 14025 Section 4.2.3.6.2 include the following.

Temporal: The LCI data was collected from the manufacturing plant for the 2024 production year.

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

Technical: The data selected for this study is specific to the technology used in the preparation of the various 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%) have been modeled.

Representative: Where possible all the data sets were selected to be representative of US-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.

4.5 Allocation

Energy inputs were allocated based on the mass of the products. Raw material inputs were allocated to specific products based on established product formulas.

5. LCA: Scenarios and Additional Technical Information

The actual transportation modes and the average distances for A4 are listed below. Both rail and truck are used for the distribution of the product.

Table 5: Transport to the Building Site (A4)

Name	1/4"	3/8"	1/2"	5/8"	Unit
Vehicle type	US Truck	US Truck	US Truck	US Truck	—
Fuel type	Diesel	Diesel	Diesel	Diesel	—
Liters of fuel (including packaging)	2.20E-02	2.73E-02	3.44E-02	4.41E-02	l/100km
Transport distance	160	160	160	160	km
Capacity utilization	0.65	0.65	0.65	0.65	—
Vehicle type	Rail	Rail	Rail	Rail	—
Fuel type	Diesel	Diesel	Diesel	Diesel	—
Liters of fuel (including packaging)	4.80E-03	5.97E-03	7.50E-03	9.63E-03	l/100km
Transport distance	1300	1300	1300	1300	km
Capacity utilization	0.40	0.40	0.40	0.40	—
Gross density of products transported (assembly only)	72.5	62.7	59.3	61.4	pcf
Gross density of products transported (assembly only)	1,160	1,005	950	985	kg/m^3

Table 6: Installation Into the Building (A5)

Name	1/4"	3/8"	1/2"	5/8"	UNIT
Ancillary materials	0.16	0.16	0.16	0.16	kg
Net freshwater consumption specified by water source and fate	0	0	0	0	m^3
Other resources	0	0	0	0	kg
Electricity consumption	0	0	0	0	kWh
Other energy carriers	0	0	0	0	MJ
Product loss per functional unit	5.39E-01	6.72E-01	8.47E-01	1.09E+00	kg
Waste materials at the construction site before waste processing, generated by product installation	7.24E-01	8.59E-01	1.04E+00	1.28E+00	kg
Output materials resulting from on-site waste processing	0	0	0	0	kg
Mass of packaging waste, dunnages	1.68E-01	1.68E-01	1.68E-01	1.68E-01	kg
Mass of packaging waste, cardboard	5.43E-03	7.09E-03	1.17E-02	6.85E-03	kg
Mass of packaging waste, plastic banding	7.53E-04	7.53E-04	7.53E-04	7.53E-04	kg
Biogenic carbon contained in packaging	-3.33E-02	-3.69E-02	-5.38E-02	-3.65E-02	kg CO_2
Direct emission to ambient air, soil, and water	~ 0	~ 0	~ 0	~ 0	kg
VOC emissions	<9	<9	<9	<9	µg/m^3

According to the PCR, there is assumed to be no energy, material, or water input required during the use phase (B1) of the roof cover protection board.

Roof cover panels shall be assumed to not need maintenance (B2), repair (B3), or refurbishment (B5) during the product RSL over the building ESL.

Roof cover panels shall be assumed to have zero impact from building operational energy use (B6) and building operational water use (B7).

Table 7. Replacement of the Installed Product (B4)

Name	Value	Unit
RSL	40	years
Replacement cycle	0.9	
Energy input	0	kWh
Net freshwater consumption specified by water source and fate	0	m^3
Ancillary material specified by type and amount	0.15 (corrosion resistant fasteners and plates)	kg
Replacement of worn parts, specify parts/materials	0	kg
Direct emissions to ambient air, soil, and water	0	kg
Further assumptions for scenario development	N/A	

Table 8: End of Life (C1-C4)

Name		1/4"	3/8"	1/2"	5/8"	Unit
Collection process (specified by type)	Collected separately	0	0	0	0	kg
	Collected with mixed construction waste	7.03E+00	8.73E+00	1.10E+01	1.40E+01	kg
Recovery (specified by type)	Reuse	0	0	0	0	kg
	Recycling	0	0	0	0	kg
	Landfill	7.03E+00	8.73E+00	1.10E+01	1.40E+01	kg
	Incineration	0	0	0	0	kg
	Incineration with energy recovery	0	0	0	0	kg
	Energy conversion efficiency rate	N/A	N/A	N/A	N/A	-
Disposal	Product or material for final deposition	7.03E+00	8.73E+00	1.10E+01	1.40E+01	kg
Removal of biogenic carbon (excluding packaging)		9.66E-1	1.25E+00	1.49E+00	1.92E+00	kg CO_2

6. Life Cycle Assessment Results

Production Stage			Construction Stage		Use Stage							End-of-Life Stage			
Raw Material Supply	Transport to factory	Manufacturing	Transport to site	Construction/Installation Process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	De-construction/Demolition	Transport	Waste Processing	Disposal
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
X	X	X	X	X	MND	MND	MND	X	MND	MND	MND	MND	X	MND	X

Figure 2: System Boundary

6.1 LCA Results

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

Table 9: North American LCA Environmental Impacts – 1 Square Meter (10.8 Square Feet) of USG 1/4" Securock® Brand Gypsum-Fiber Roof Board (A1-A3) with Options

Impact Category	Units	A1-A3	A4	A5	B4	C2	C4
Global Warming Potential-Total (GWP-Total)[1]	kg CO_2 eq.	1.32E+00	3.94E-01	7.86E-01	3.83E+00	9.33E-02	1.36E+00
Global Warming Potential-Fossil (GWP-fossil)[1]	kg CO_2 eq.	2.42E+00	3.91E-01	7.38E-01	3.72E+00	9.32E-02	3.90E-01
Global Warming Potential-Biogenic (GWP-biogenic)[1]	kg CO_2 eq.	-1.10E+00	3.07E-03	4.73E-02	1.07E-01	0.00E+00	9.66E-01
Global Warming Potential-Land Use Change (GWP-luluc)[1]	kg CO_2 eq.	5.93E-04	2.09E-04	3.70E-04	1.57E-03	4.93E-05	4.17E-04
Ozone Depletion Potential (ODP)[2]	kg CFC 11eq.	3.53E-11	1.12E-13	6.57E-12	3.82E-11	2.64E-14	3.65E-13
Acidification Potential (AP)[2]	kg SO_2 eq.	7.17E-03	1.96E-03	1.80E-03	1.17E-02	1.70E-04	1.49E-03
Eutrophication Potential (EP)[2]	kg N eq.	1.66E-03	1.83E-03	8.09E-04	4.67E-03	1.46E-04	5.88E-04
Photochemical Ozone Creation Potential (POCP)[2]	kg O_3 eq.	6.02E-02	6.42E-02	2.81E-02	1.58E-01	3.74E-03	1.56E-02
Abiotic Depletion Potential Fossil Fuels (ADP-fossil)[3]	MJ, LHV	3.24E+01	5.03E+00	7.52E+00	4.33E+01	1.18E+00	1.43E+00

[1] IPCC AR6
GWP-Total = GWP-fossil + GWP-biogenic + GWP-luluc
[2] TRACI 2.2
[3] CML August 2016

Table 10: Resource and Waste Flows for 1 Square Meter (10.8 Square Feet) of USG 1/4" Securock® Brand Gypsum-Fiber Roof Board (A1-A3) with Options, EN 15804+A2

Use of Primary Resources	Units	A1-A3	A4	A5	B4	C2	C4
Renewable primary resources used as an energy carrier (RPRE)	MJ, NCV	2.34E+00	2.11E-01	1.35E+00	3.87E+00	4.99E-02	2.77E-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	0.00E+00	0.00E+00
Non-renewable primary resources used as an energy carrier (NRPRE)	MJ, NCV	3.51E+01	5.07E+00	8.06E+00	4.64E+01	1.19E+00	1.47E+00
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	0.00E+00	0.00E+00
Secondary material, fuel, and recovered energy	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**C4**
Secondary material (SM)	kg	7.77E+00	0.00E+00	5.44E-01	7.48E+00	0.00E+00	0.00E+00
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
Recovered 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 (FW)	m3	1.18E-02	2.28E-04	1.88E-03	1.30E-02	5.38E-05	3.77E-04
Emissions inventory parameters for transparency	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**C4**
Biogenic carbon content of product	kg CO_2 eq.	-1.07E+00	0.00E+00	0.00E+00	1.07E-01	0.00E+00	9.66E-01
Calcination uptake from carbonation	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon of bio-based packaging	kg CO_2 eq.	-3.11E-02	0.00E+00	3.11E-02	0.00E+00	0.00E+00	0.00E+00
Combustion of waste from renewable sources used in production	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Combustion of waste from non-renewable sources used in production	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indicators describing waste	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**C4**
Hazardous waste disposed (HWD)	kg	1.66E-06	8.42E-10	2.50E-07	1.72E-06	1.99E-10	3.27E-10
Non-hazardous waste disposed (NHWD)	kg	3.98E-02	5.19E-04	7.28E-01	8.37E+00	1.23E-04	6.92E+00
High-level radioactive waste (RWD)	kg	9.80E-04	1.74E-05	1.91E-04	1.09E-03	4.12E-06	1.55E-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	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**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

Table 11: North American LCA Environmental Impacts – 1 Square Meter (10.8 Square Feet) of USG 3/8" Securock® Brand Gypsum-Fiber Roof Board (A1-A3) with Options

Impact Category	Units	A1-A3	A4	A5	B4	C2	C4
Global Warming Potential-Total (GWP-Total)[1]	kg CO_2 eq.	1.62E+00	4.88E-01	8.51E-01	4.67E+00	1.15E-01	1.72E+00
Global Warming Potential-Fossil (GWP-fossil)[1]	kg CO_2 eq.	3.04E+00	4.84E-01	7.98E-01	4.53E+00	1.15E-01	4.67E-01
Global Warming Potential-Biogenic (GWP-biogenic)[1]	kg CO_2 eq.	-1.42E+00	3.79E-03	5.33E-02	1.39E-01	0.00E+00	1.25E+00
Global Warming Potential-Land Use Change (GWP-luluc)[1]	kg CO_2 eq.	7.53E-04	2.58E-04	3.94E-04	1.91E-03	6.12E-05	5.18E-04
Ozone Depletion Potential (ODP)[2]	kg CFC 11eq.	4.41E-11	1.38E-13	7.19E-12	4.68E-11	3.27E-14	4.53E-13
Acidification Potential (AP)[2]	kg SO_2 eq.	9.26E-03	2.43E-03	2.01E-03	1.46E-02	2.11E-04	1.80E-03
Eutrophication Potential (EP)[2]	kg N eq.	2.12E-03	2.27E-03	8.87E-04	5.75E-03	1.82E-04	7.15E-04
Photochemical Ozone Creation Potential (POCP)[2]	kg O_3 eq.	7.67E-02	7.93E-02	3.07E-02	1.94E-01	4.64E-03	1.92E-02
Abiotic Depletion Potential Fossil Fuels (ADP-fossil)[3]	MJ, LHV	4.06E+01	6.22E+00	8.23E+00	5.31E+01	1.47E+00	1.78E+00

[1] IPCC AR6
GWP-Total = GWP-fossil + GWP-biogenic + GWP-luluc
[2] TRACI 2.2
[3] CML August 2016

Table 12: Resource and Waste Flows for 1 Square Meter (10.8 Square Feet) of USG 3/8" Securock® Brand Gypsum-Fiber Roof Board (A1-A3) with Options, EN 15804+A2

Use of Primary Resources	Units	A1-A3	A4	A5	B4	C2	C4
Renewable primary resources used as an energy carrier (RPRE)	MJ, NCV	2.98E+00	2.62E-01	1.41E+00	4.63E+00	6.20E-02	3.43E-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	0.00E+00	0.00E+00
Non-renewable primary resources used as an energy carrier (NRPRE)	MJ, NCV	4.40E+01	6.28E+00	8.82E+00	5.68E+01	1.49E+00	1.83E+00
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	0.00E+00	0.00E+00
Secondary material, fuel, and recovered energy	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**C4**
Secondary material (SM)	kg	1.01E+01	0.00E+00	7.07E-01	9.72E+00	0.00E+00	0.00E+00
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
Recovered 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 (FW)	m3	1.53E-02	2.82E-04	2.13E-03	1.65E-02	6.68E-05	4.66E-04
Emissions inventory parameters for transparency	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**C4**
Biogenic carbon content of product	kg CO_2 eq.	-1.39E+00	0.00E+00	0.00E+00	1.39E-01	0.00E+00	1.25E+00
Calcination uptake from carbonation	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon of bio-based packaging	kg CO_2 eq.	-3.46E-02	0.00E+00	3.46E-02	0.00E+00	0.00E+00	0.00E+00
Combustion of waste from renewable sources used in production	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Combustion of waste from non-renewable sources used in production	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indicators describing waste	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**C4**
Hazardous waste disposed (HWD)	kg	2.08E-06	1.04E-09	2.79E-07	2.12E-06	2.47E-10	4.06E-10
Non-hazardous waste disposed (NHWD)	kg	5.13E-02	6.43E-04	8.59E-01	1.04E+01	1.53E-04	8.59E+00
High-level radioactive waste (RWD)	kg	1.23E-03	2.16E-05	2.10E-04	1.34E-03	5.11E-06	1.92E-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	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**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

Table 13: North American LCA Environmental Impacts – 1 Square Meter (10.8 Square Feet) of USG 1/2" Securock® Brand Gypsum-Fiber Roof Board (A1-A3) with Options

Impact Category	Units	A1-A3	A4	A5	B4	C2	C4
Global Warming Potential-Total (GWP-Total)[1]	kg CO_2 eq.	2.12E+00	6.17E-01	9.50E-01	5.78E+00	1.46E-01	2.11E+00
Global Warming Potential-Fossil (GWP-fossil)[1]	kg CO_2 eq.	3.83E+00	6.11E-01	8.76E-01	5.61E+00	1.46E-01	6.16E-01
Global Warming Potential-Biogenic (GWP-biogenic)[1]	kg CO_2 eq.	-1.71E+00	4.79E-03	7.30E-02	1.66E-01	0.00E+00	1.49E+00
Global Warming Potential-Land Use Change (GWP-luluc)[1]	kg CO_2 eq.	9.28E-04	3.26E-04	4.24E-04	2.32E-03	7.74E-05	6.53E-04
Ozone Depletion Potential (ODP)[2]	kg CFC 11eq.	5.31E-11	1.74E-13	7.83E-12	5.56E-11	4.14E-14	5.74E-13
Acidification Potential (AP)[2]	kg SO_2 eq.	1.13E-02	3.07E-03	2.24E-03	1.78E-02	2.67E-04	2.35E-03
Eutrophication Potential (EP)[2]	kg N eq.	2.62E-03	2.86E-03	9.83E-04	7.07E-03	2.30E-04	9.26E-04
Photochemical Ozone Creation Potential (POCP)[2]	kg O_3 eq.	9.49E-02	1.00E-01	3.39E-02	2.39E-01	5.87E-03	2.45E-02
Abiotic Depletion Potential Fossil Fuels (ADP-fossil)[3]	MJ, LHV	5.13E+01	7.85E+00	9.16E+00	6.60E+01	1.86E+00	2.25E+00

[1] IPCC AR6
GWP-Total = GWP-fossil + GWP-biogenic + GWP-luluc
[2] TRACI 2.2
[3] CML August 2016

Table 14: Resource and Waste Flows for 1 Square Meter (10.8 Square Feet) of USG 1/2" Securock® Brand Gypsum-Fiber Roof Board (A1-A3) with Options, EN 15804+A2

Use of Primary Resources	Units	A1-A3	A4	A5	B4	C2	C4
Renewable primary resources used as an energy carrier (RPRE)	MJ, NCV	3.82E+00	3.29E-01	1.49E+00	5.63E+00	7.84E-02	4.35E-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	0.00E+00	0.00E+00
Non-renewable primary resources used as an energy carrier (NRPRE)	MJ, NCV	5.57E+01	7.93E+00	9.81E+00	7.07E+01	1.88E+00	2.31E+00
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	0.00E+00	0.00E+00
Secondary material, fuel, and recovered energy	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**C4**
Secondary material (SM)	kg	1.21E+01	0.00E+00	8.50E-01	1.17E+01	0.00E+00	0.00E+00
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
Recovered 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 (FW)	m3	1.85E-02	3.56E-04	2.38E-03	1.99E-02	8.46E-05	5.92E-04
Emissions inventory parameters for transparency	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**C4**
Biogenic carbon content of product	kg CO_2 eq.	-1.66E+00	0.00E+00	0.00E+00	1.66E-01	0.00E+00	1.49E+00
Calcination uptake from carbonation	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon of bio-based packaging	kg CO_2 eq.	-5.03E-02	0.00E+00	5.03E-02	0.00E+00	0.00E+00	0.00E+00
Combustion of waste from renewable sources used in production	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Combustion of waste from non-renewable sources used in production	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indicators describing waste	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**C4**
Hazardous waste disposed (HWD)	kg	2.49E-06	1.31E-09	3.08E-07	2.52E-06	3.12E-10	5.15E-10
Non-hazardous waste disposed (NHWD)	kg	6.35E-02	8.11E-04	1.04E+00	1.31E+01	1.93E-04	1.09E+01
High-level radioactive waste (RWD)	kg	1.55E-03	2.72E-05	2.33E-04	1.66E-03	6.47E-06	2.43E-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	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**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

Table 15: North American LCA Environmental Impacts – 1 Square Meter (10.8 Square Feet) of USG 5/8" Securock® Brand Gypsum-Fiber Roof Board (A1-A3) with Options

Impact Category	Units	A1-A3	A4	A5	B4	C2	C4
Global Warming Potential-Total (GWP-Total)[1]	kg CO_2 eq.	2.69E+00	7.84E-01	1.03E+00	7.20E+00	1.86E-01	2.70E+00
Global Warming Potential-Fossil (GWP-fossil)[1]	kg CO_2 eq.	4.85E+00	7.77E-01	9.71E-01	6.99E+00	1.86E-01	7.85E-01
Global Warming Potential-Biogenic (GWP-biogenic)[1]	kg CO_2 eq.	-2.16E+00	6.09E-03	5.95E-02	2.13E-01	0.00E+00	1.92E+00
Global Warming Potential-Land Use Change (GWP-luluc)[1]	kg CO_2 eq.	1.17E-03	4.14E-04	4.62E-04	2.87E-03	9.83E-05	8.29E-04
Ozone Depletion Potential (ODP)[2]	kg CFC 11eq.	6.78E-11	2.22E-13	8.87E-12	7.01E-11	5.25E-14	7.29E-13
Acidification Potential (AP)[2]	kg SO_2 eq.	1.42E-02	3.91E-03	2.55E-03	2.22E-02	3.39E-04	2.99E-03
Eutrophication Potential (EP)[2]	kg N eq.	3.30E-03	3.65E-03	1.11E-03	8.86E-03	2.92E-04	1.17E-03
Photochemical Ozone Creation Potential (POCP)[2]	kg O_3 eq.	1.19E-01	1.27E-01	3.82E-02	2.99E-01	7.45E-03	3.11E-02
Abiotic Depletion Potential Fossil Fuels (ADP-fossil)[3]	MJ, LHV	6.51E+01	9.99E+00	1.04E+01	8.26E+01	2.37E+00	2.85E+00

[1] IPCC AR6
GWP-Total = GWP-fossil + GWP-biogenic + GWP-luluc
[2] TRACI 2.2
[3] CML August 2016

Table 16: Resource and Waste Flows for 1 Square Meter (10.8 Square Feet) of USG 5/8" Securock® Brand Gypsum-Fiber Roof Board (A1-A3) with Options, EN 15804+A2

Use of Primary Resources	Units	A1-A3	A4	A5	B4	C2	C4
Renewable primary resources used as an energy carrier (RPRE)	MJ, NCV	4.54E+00	4.20E-01	1.55E+00	6.58E+00	9.95E-02	5.52E-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	0.00E+00	0.00E+00
Non-renewable primary resources used as an energy carrier (NRPRE)	MJ, NCV	7.06E+01	1.01E+01	1.11E+01	8.85E+01	2.39E+00	2.94E+00
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	0.00E+00	0.00E+00
Secondary material, fuel, and recovered energy	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**C4**
Secondary material (SM)	kg	1.54E+01	0.00E+00	1.08E+00	1.48E+01	0.00E+00	0.00E+00
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
Recovered 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 (FW)	m3	2.35E-02	4.53E-04	2.74E-03	2.49E-02	1.07E-04	7.52E-04
Emissions inventory parameters for transparency	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**C4**
Biogenic carbon content of product	kg CO_2 eq.	-2.13E+00	0.00E+00	0.00E+00	2.13E-01	0.00E+00	1.92E+00
Calcination uptake from carbonation	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon of bio-based packaging	kg CO_2 eq.	-3.41E-02	0.00E+00	3.41E-02	0.00E+00	0.00E+00	0.00E+00
Combustion of waste from renewable sources used in production	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Combustion of waste from non-renewable sources used in production	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indicators describing waste	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**C4**
Hazardous waste disposed (HWD)	kg	3.19E-06	1.67E-09	3.57E-07	3.19E-06	3.97E-10	6.53E-10
Non-hazardous waste disposed (NHWD)	kg	7.84E-02	1.03E-03	1.26E+00	1.65E+01	2.44E-04	1.38E+01
High-level radioactive waste (RWD)	kg	1.97E-03	3.47E-05	2.64E-04	2.08E-03	8.21E-06	3.09E-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	**Units**	**A1-A3**	**A4**	**A5**	**B4**	**C2**	**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

Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building or construction works has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase only when performance and specifications for product or construction works have been established and serve as a functional unit for comparison.

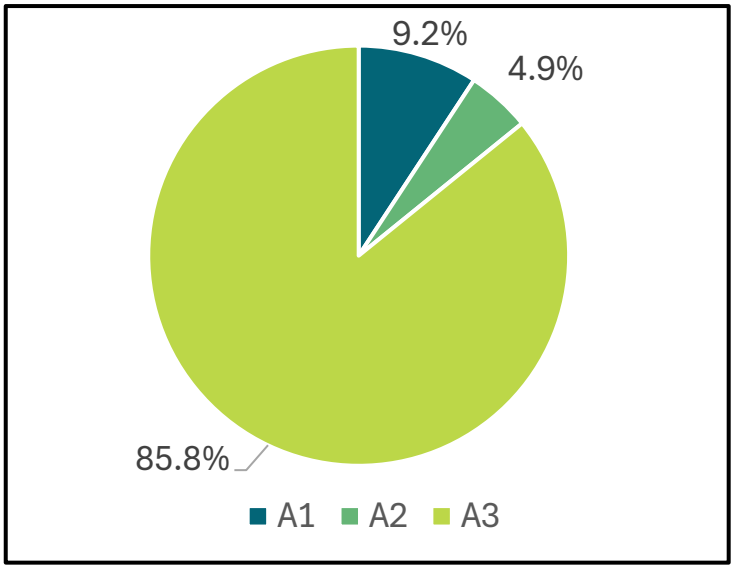
Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building or construction works level, and therefore EPDs may not be used for comparability 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 in results upstream or downstream of the life cycle stages declared.

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, are based on different product category rules or are missing relevant environmental impacts. Such comparisons can be inaccurate and could lead to erroneous selection of materials or products that have higher impact, at least in some impact categories.

6.2 LCA Interpretation

The LCA results for the production of USG Securock® Brand Gypsum-Fiber Roof Board were dominated by energy usage during manufacturing. Figure 3 shows the result for GWP-fossil of 1/2" Securock® panel, the highest volume product. Future efforts to reduce the GWP should focused on reducing the weight of the panels.

Figure 3: Process Dominance Analysis for GWP-fossil for the Production of 1 Square Meters (10.8 Square Feet) of 1/2" USG Securock® Brand Gypsum-Fiber Roof Board, (A1-A3)



7. References

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