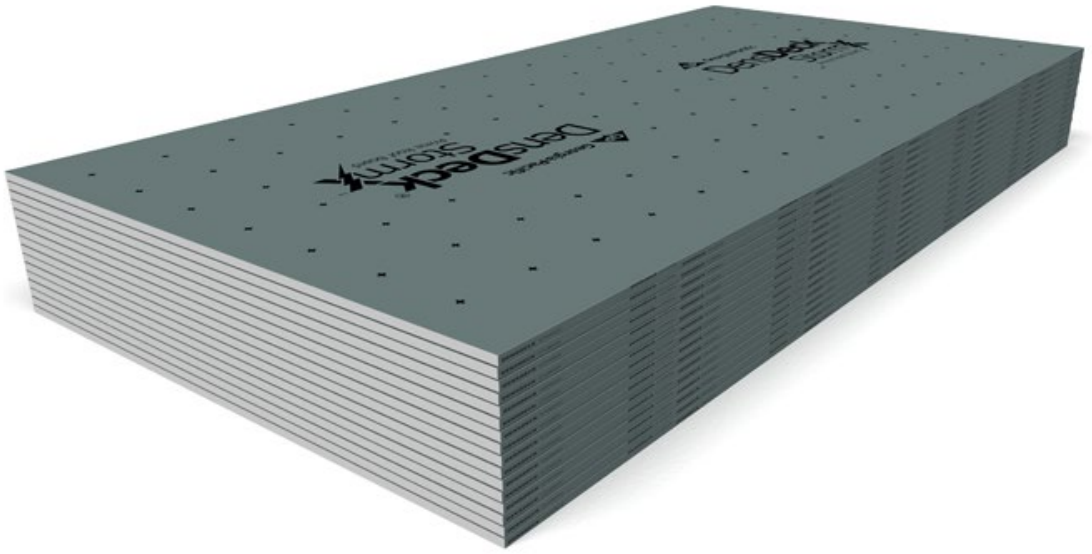
Georgia-Pacific Gypsum

Environmental Product Declaration

ACCORDING TO ISO 14025:2006 AND ISO 21930:2017

Type III environmental product declaration (EPD) developed according to ISO 14025:2006 and 21930:2017 for Gypsum 5/8" DensDeck® StormX® Prime Roof Board



NSF Certified Environmental Product Declaration www.nsf.org

EPD Program and Program Operator Name, Address, Logo, and Website	NSF Certification LLC 789 N. Dixboro, Ann Arbor, MI 48105 www.nsf.org
General Program Instructions and Version Number	NSF Program Operator Rules, NSF International. February 23, 2015
Manufacturer Name and Address	Georgia-Pacific Gypsum, LLC 133 Peachtree St NE Atlanta, GA 30303
Declaration Number	EPD11131
Declared Product & Functional Unit	5/8" DensDeck® StormX® Prime Roof Board 1 m^2 of installed roof cover board
Reference PCR and Version Number	ULE Part A: Life Cycle Assessment Calculation Rules and Reports Requirements, v4.0 ULE Part B: Roof Cover Protection Board EPD Requirements, v1.0
Description of product's intended application and use (as identified when determining product RSL)	5/8" DensDeck® StormX® Prime Roof Board is used in a variety of commercial roof assemblies both as a roof cover board below the roof membrane and a thermal barrier above the roof deck. Its enhanced strength and impact resistance helps protect against extreme hail, wind, uplift, punctures and fire.
Product RSL Description (if Appl.)	40 years
Markets of Applicability	North America
Date of Issue	August 8, 2025
Period of Validity	08/08/2025 - 08/08/2030
EPD Type	Product-specific
Dataset Variability	N/A
EPD Scope	Cradle to gate with options (A4, A5, B4, C1-C4)
Year(s) of reported manufacturer primary data	2023
LCA Software & Version Number	Sphera's LCA FE (fka GaBi) v10.9.0.20
LCI Database(s) & Version Number	Sphera's MLC (fka GaBi) v2025.1
LCIA Methodology & Version Number	IPCC AR6, IPCC AR5, TRACI v2.1; CML v4.7

The sub-category PCR review was conducted by:	Jack Geibig (Chair), Angela Fisher, Mike Ennis
This declaration was independently verified in accordance with ISO 14025: 2006. The UL Environment "Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report," v3.2 (December 2018), in conformance with ISO 21930:2017, serves as the core PCR ☐ INTERNAL X EXTERNAL	Jack Geibig, EcoForm, LLC jgeibig@ecoform.com
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	Sphera Solutions, Inc.
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Jack Geibig, EcoForm, LLC jgeibig@ecoform.com

Limitations

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 building energy use phase as instructed under this PCR.

Full conformance with this PCR allows EPD comparability only 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.

1 General Information

1.1 Description of Organization

Georgia-Pacific Gypsum LLC manufacturers a wide array of interior and exterior products designed to provide the highest level of performance in the most challenging commercial and residential applications. Since 1965, Georgia-Pacific has developed the highest quality gypsum building products in the industry. Georgia-Pacific's versatile ToughRock® gypsum boards are ideal for interior applications, and the Dens® family of high-performance fiberglass mat-faced gypsum products offer exceptional strength and superior moisture, mold and fire resistance. Today, Georgia-Pacific is still innovating groundbreaking gypsum products designed to help construct the highest quality commercial and residential buildings.

1.2 Product Definition

DensDeck® StormX® Prime Roof Board is designed to address persistent challenges inherent in commercial roofing assemblies, such as fire resistance, strength and dimensional stability, when installed in a properly designed roof assembly. It is a fiberglass mat-faced, noncombustible (as described and tested in accordance with ASTM E136), nonstructural, gypsum core panel, and is recommended for mechanically attached, adhered and partially adhered roofing systems. DensDeck® StormX® Prime Roof Board is FM-classified for Very Severe Hail (VSH) in approved single-ply membrane assemblies (consult RoofNav®, FM's tool for roofing professionals, for specific assemblies).

1.2.1 Product Identification

5/8" DensDeck® StormX® Prime Roof Board is a 0.625" (1.59 cm) thick Glass Mat Gypsum Panel and is sold in 4' x 4' (1.219 m x 1.219 m) and 4' x 8' (1.219 m x 2.438 m) sheets as shown in Figure-1-1.

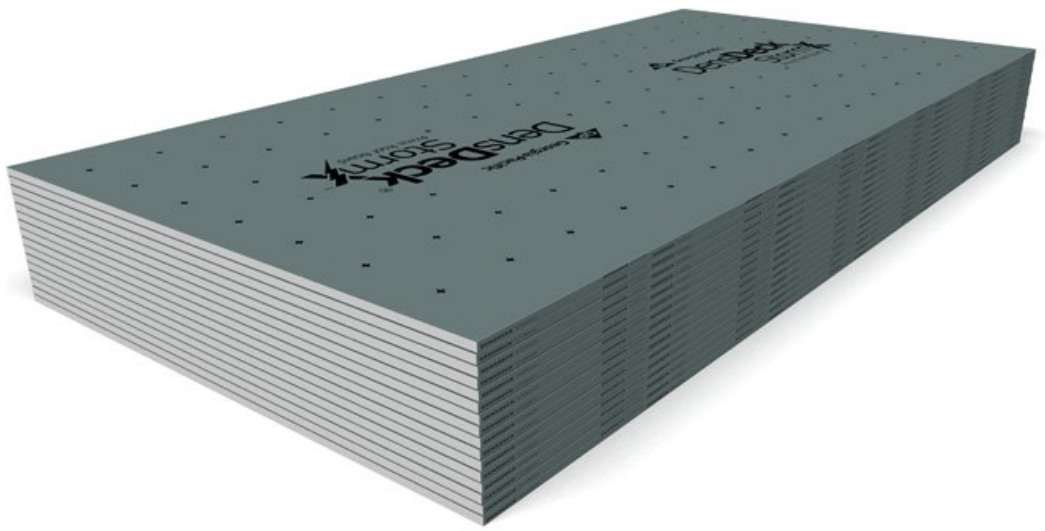


Figure 1-1: Image of DensDeck Roof Board

1.2.2 Product Specification

5/8" DensDeck® StormX® Prime Roof Board complies with the standards listed in Table 1-1. Additional technical information, installation guides, product safety data sheets, and health product declarations can be found at www.buildgp.com.

Table 1-1: Technical specification data for 5/8" DensDeck® StormX® Prime Roof Board

Name	Standard	Value	Unit
Mass	-	3.08 (15)	lb/sf (kg/m^2)
Thickness	ASTM C473	0.625 ± 0.03125 (15.9 ± 0.8)	in (mm)
Compressive Strength	ASTM C473	1800 (12410)	psi (kPa)
Total Water Absorption	ASTM C473	≤5.0	%
Surface Water Absorption	ASTM C473	1.0	g
R-value	ASTM C518	0.67 (0.12)	ft^2•°F• hr/BTU (m^2• K/W)
Linear Variation with Change in Temperature		8.5E-06 (15.3E-06)	in/in/°F (mm/mm/°C)
Linear Variation with Change in Moisture		11.7E-06 (0.459333)	in/in/% RH (mm/mm/% RH)
Permeance	ASTM E96	>17 >970	perm (ng/Pa• s• m^2)
Mold Resistance	ASTM 3273	10 (highest possible)	
Flute Spanability	ASTM E661	18 (457)	in (mm)

Figure 1-1 shows a simplified process flow diagram for the 5/8" DensDeck® StormX® Prime Roof Board

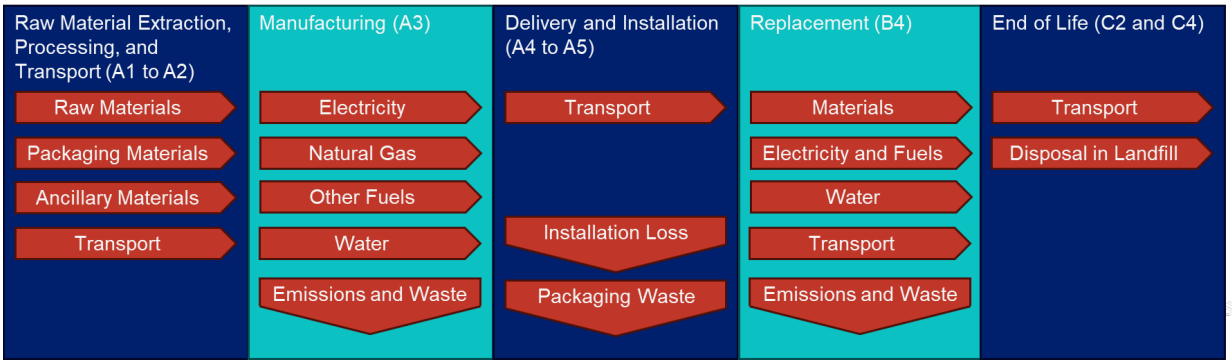


Figure 1-1: Simplified process flow diagram for 5/8" DensDeck® StormX® Prime Roof Board

1.2.3 Product-Specific EPD

5/8" DensDeck® StormX® Prime Roof Board is produced at 2 facilities across the US:

- Fletcher, Oklahoma
- Fort Dodge, Iowa

The weighted average results for 5/8" DensDeck® StormX® Prime Roof Board were calculated based on its 2023 annual throughput from each facility.

1.2.4 Application

5/8" DensDeck® StormX® Prime Roof Board is primarily used in commercial roof assemblies under the roofing membrane and have a reference service life (RSL) of 40 years.

1.2.5 Material Composition

The material content for 5/8" DensDeck® StormX® Prime Roof Board is shown in Table 1-2. Product formulation (wet value at the time of manufacture), on the basis of 1 m^2 of 5/8" DensDeck® StormX® Prime Roof Board output (dry value) with a finished density of 15 kg/m^2 (3.08 lb/ ft^2) at 0.5% moisture content at the facility gate.

Calcium sulfated dihydrate (gypsum), fibrous glass (fiberglass), crystalline silica (quartz), and vermiculite are listed in the Glass Mat Faced Gypsum Panel Safety Data Sheet. 5/8" DensDeck® StormX® Prime Roof Board is not hazardous in the form in which it is shipped by the manufacturer but may become hazardous by downstream activities such as cutting, sanding, or otherwise working with this product that generate large amounts of dust.

Table 1-2: Material composition

INGREDIENT NAME	CAS NUMBER	PERCENT COMPOSITION
Calcium sulfate dihydrate (gypsum)	10101-41-4	73.7
Fibrous glass (fiberglass)	65997-17-3	4.6
Crystalline Silica (quartz)	14808-60-7	0
Vermiculite	1318-00-9	0
Additional wet and dry additives	N/A	21.7

2 Methodological Framework

2.1 Functional Unit

Per section 3.1 of the Part B PCR (UL Environment, 2021), the functional unit for this EPD is 1 m^2 of installed roof cover board, excluding other layers, ancillary materials, fasteners, and adhesives required to achieve the expected performance. Additional details are provided in Table 2-1.

Table 2-11: Functional unit properties

NAME	VALUE
Functional Unit	1 m^2 installed roof cover board, including 7% installation waste
Declared thickness	1.27 cm (0.5 in)
Surface weighted per functional unit	15 kg/m^2 (3.08 lbm/ft^2)

2.2 System Boundary

The system boundary for this EPD is cradle to gate with options (A4, A5, B4, C1-C4) as shown in Table 2-2.

Table 2-22: Description of the system boundary modules

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Building Operational Energy Use During Product Use	Building Operational Water Use During Product Use	Deconstruction	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling Potential
x	x	x	X	X	MND	MND	MND	X	MND	MND	MND	X	X	X	X	MND

2.3 Product Specific Calculations for Use Phase

Per PCR Part B section 3.5 (UL Environment, 2021), modules B1, B2, B3, B5, B6, and B7 are assumed to be zero for 5/8" DensDeck® StormX® Prime Roof Board.

2.4 Reference Service Life and Estimated Building Service Life

The default reference service life (RSL) of 40 years and building estimated service life of 75 years provided in the Part B PCR section 3.6 (UL Environment, 2021) is used for this EPD.

2.5 Allocation

Facility-level data such as air, water and soil emissions, gypsum raw material, paper raw material, water consumption and energy were allocated according to production mass as required by the Part B PCR section 3.7 (UL Environment, 2021). There are no co-products in the foreground system, therefore allocation was not required.

Descriptions of allocation procedures in Sphera's MLC background datasets are available online at https://lcadatabase.sphera.com/ (Sphera, 2025)

2.6 Cut-Off Rules

Per the Part B PCR section 3.8 (UL Environment, 2021), all known mass and energy flows are reported for the processes within the system boundary, and no known energy or material flows have been deliberately excluded. Use of tools for installation has been excluded, since they are used in many projects, it is difficult to determine the exact share of specific installation, and they are assumed to contribute negligibly to the results. Energy use for installation and deconstruction was excluded based on Part B PCR section 3.13 (UL Environment, 2021). Any excluded flows are less than 1% of energy, mass, or environmental impacts, and the total excluded flows per module are less than 5%. In cases where no matching life cycle inventories are available to represent a flow, proxy data have been applied based on conservative assumptions regarding environmental impacts.

2.7 Data Sources

Primary data for material and energy inputs associated with the production of 5/8" DensDeck® StormX® Prime Roof Board were collected for each of the 7 that produce it. This primary data was provided for the 12 calendar months of 2023.

Secondary data from Sphera's managed LCA content (MLC) v2025.1 was used for environmental burdens associated with raw materials and energy inputs and waste management processes as described in the background report. Table 2-3 lists all the datasets used in the model. Additional information on these datasets can be found online at https://lcadatabase.sphera.com/ (Sphera, 2025).

Table 2-3: List of secondary datasets used

FLOW/ PROCESS	GEO REF	DATASET	PROVIDER	REF YEAR
Energy and Transport				
Electricity	US	Electricity grid mix	Sphera	2022
	Fletcher, OK	Electricity grid mix – SPSO	Sphera	2022
	Fort Dodge, IA	Electricity grid mix – MROW	Sphera	2022
Thermal Energy	US	Natural gas mix	Sphera	2021
Diesel	US	Diesel mix at refinery	Sphera	2021
	US	Diesel mix at filling station	Sphera	2021
Propane	US	Propane at refinery	Sphera	2021
Gasoline	US	Gasoline mix (regular) at refinery	Sphera	2021
Truck	US	Truck - Trailer, basic enclosed / 45,000 lb payload - 8b	Sphera	2023
Other Raw Materials				
Ammonium sulfate	US	Ammonium sulphate, by product acrylonitrile, hydrocyanic acid	Sphera	2024
Boric acid	US	Boric acid by-product sodium sulfate (approximation)	Sphera	2024
Dispersing agent	GLO	Dispersing agent (anionic dispersant and ethoxylate non-ionic mixture)	Sphera	2024
Dried starch	US	Dried starch (corn wet mill) (economic allocation)	Sphera	2024
Ethylenediaminetetraacetic acid	RER	Ethylenediaminetetraacetic acid (EDTA) (approximation)	Sphera	2024
Glass fibers	US	Glass fibres	Sphera	2024
Glucose	US	Glucose (via starch hydrolysis)	Sphera	2024
Kraft paper	RER	Kraft paper (EN15804 A1-A3)	Sphera	2024
Softwood Lumber	US	Lumber softwood (at sawmill, economic allocation)	Sphera	2024
Lubricants	US	Lubricants at refinery	Sphera	2021
Surfactant	GLO	Non-ionic surfactant (fatty acid derivate)	Sphera	2024
Polyacrylate ink	US	Polyacrylate ink (approximation)	Sphera	2024
Polyethylene Film	US	Polyethylene Film (LDPE/PE-LD)	Sphera	2024
Portland cement	US	Portland cement	PCA	2024
Potassium persulfate	RER	Potassium persulfate	Sphera	2024
Wood Incineration	US	Pure wood (10% H2O content) in waste incineration plant	Sphera	2024
Silicate dispersion	DE	Silicate dispersion plaster	Sphera	2024
Siloxane	US	Siloxane (cyclic) (from organosilanes)	Sphera	2024
Sodium sulfate	DE	Sodium sulfate by-product sodium chlorite (from	Sphera	2024

FLOW/ PROCESS	GEO REF	DATASET	PROVIDER	REF YEAR
		sodium chlorates)		
Vermiculite	US	Vermiculite	Sphera	2024
Wax / Paraffins	RER	Wax / Paraffins at refinery	Sphera	2021
White Mineral Oil	US	Lubricants at refinery	Sphera	2021
Utilities and Waste Management				
Tap Water	US	Tap water from groundwater	Sphera	2024
Tap Water	US	Tap water from surface water	Sphera	2024
Mfg. Waste Landfilling	US	Inert matter (Glass) on landfill	Sphera	2024
Product Landfilling	RER	Inert matter (Unspecific construction waste) on landfill	Sphera	2024
Paper Incineration	US	Paper waste (water 0%) in waste incineration plant	Sphera	2024
Paper Landfilling	US	Paper waste on landfill, post-consumer	Sphera	2024
Plastic Landfilling	US	Plastic waste on landfill, post-consumer	Sphera	2024
Plastic Incineration	US	Plastics wastes in waste incineration plant (0% H2O content)	Sphera	2024
Wastewater Treatment	US	Municipal wastewater treatment (mix)	Sphera	2024

2.8 Data Quality

A detailed description of the data collected, and the data quality requirements related to ISO 14044:2006 (ISO, 2006b), ISO 21930:2017 (ISO, 2017), and the UL Part A (UL Environment, 2022) and Part B (UL Environment, 2021) PCRs is provided in the LCA background report and is summarized here. Data quality is assessed based on its representativeness (technology coverage, geographic coverage, time coverage), precision, completeness, consistency, reproducibility, transparency, and uncertainty as shown in Table 2-4. Additionally, secondary LCI data sets outside of the databases listed in section 3.1.2 of the UL Part A (UL Environment, 2022) contribute less than 80% of total impact to any of the required impact categories.

Table 2-4: Summary of Data Quality Assessment

METRIC	DESCRIPTION	EVALUATION
Geographic Representativeness	All primary and secondary data were collected specific to the countries or regions under study. Where country-specific or region-specific data were unavailable, proxy data were used.	Very Good
Technological Representativeness	All primary and secondary data were modeled to be specific to the technologies or technology mixes under study. Where technology-specific data were unavailable, proxy data were used.	Very Good
Temporal Representativeness	All primary data were collected for the year 2023. All secondary data come from the MLC 2025.1 databases and are representative of the years 2020 – 2024	Very Good
Completeness	Each foreground process was checked for mass balance and completeness of the emission inventory. No data were knowingly omitted. All background data are sourced from MLC 2025.1 databases with the documented completeness.	Very Good

2.9 Period Under Review

Primary data was collected for the calendar year 2023.

2.10 Estimates and Assumptions

Assumptions associated with product transport, installation, and deconstruction based on Part B PCR section 3.13 (UL Environment, 2021) are shown in Table 2-5.

Table 2-5: Transport, installation, and deconstruction assumptions

Product transport from point of manufacture to building site	Mode: Diesel-powered truck/trailer Distance: 800 km
Product transport from building site to waste processing	Mode: Diesel-powered truck/trailer Distance: 161 km
Installation & deconstruction procedures	Manual (no operational energy use)

3 Technical Information and Scenarios

3.1 Manufacturing (A1 to A3)

Crushed natural gypsum, found in sedimentary rock formations, or synthetic gypsum, FGD, is heated in a process called calcination to remove moisture. The calcined gypsum is mixed with water and additives to enhance the board's characteristics, and a slurry is formed. This slurry is fed onto a continuously moving sheet of glass mat, and another sheet is laid on top. As the board moves down the conveyer, the gypsum begins recrystallizing, and the hardened board is cut to finished length and dried to remove any free moisture. End tape is applied to the finished product, and it is packaged for shipment. Georgia-Pacific produces roof board at eight different facilities across the US and each manufacturing sites follows the same general processes as shown in Figure 3-1.

For each 1000 kg of 5/8" DensDeck® StormX® Prime Roof Board, 20.4 kg of gypsum are beneficially reused or recycled offsite and 67.3 kg are taken by truck an average of 68 km to be landfilled.

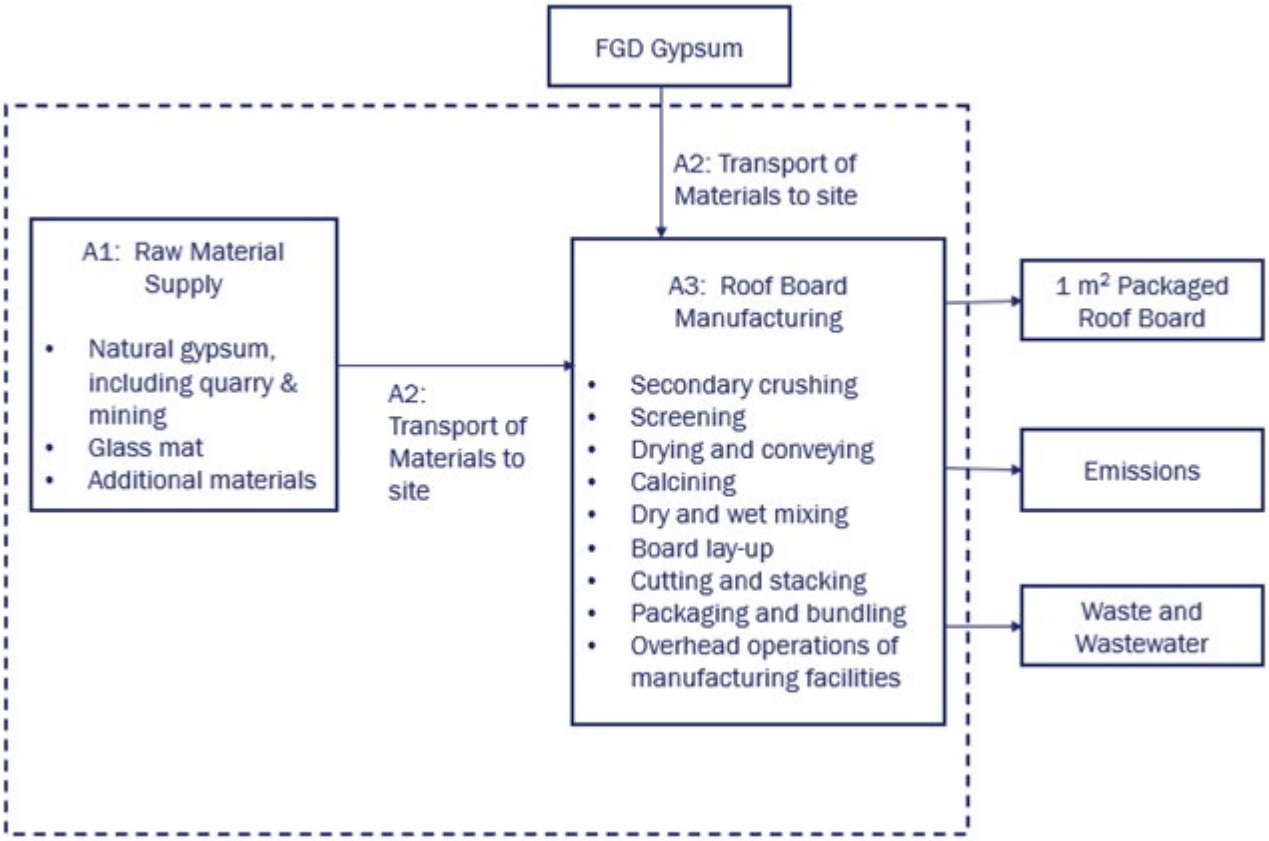


Figure 3-1: Simple flow chart providing details on the Product Stage (A1 to A3) for 5/8" DensDeck® StormX® Prime Roof Board

3.2 Packaging

Roof board Is shipped on pallets from every facility except Las Vegas and Lovell. The mass of pallets per m2 of roof board are shown in Table 3-1. Production of packaging is included in module A3 and only one reuse of pallets is considered. Transport of the packaging to the manufacturing sites is included in module A2, while transport of the packaging to the installation site is included in module A4. Packaging disposition at end-of-life is based on PCR Part B, Section 4.2, Table 3 (UL Environment, 2021) and is included in section A5.

Table 3-1: Packaging composition and disposition at end-of-life.

MATERIAL	MASS	UNITS	DISPOSITION AT END-OF-LIFE
Pallets	4.84	kg/m²	Reused once and then landfilled

3.3 Transport to the Building Site (A4)

Table 3-2 shows the assumptions associated with transport of the packaged 5/8" DensDeck® StormX® Prime Roof Board to the building site.

Table 3-2: Transport to the building site (A4) details

NAME	VALUE	UNITS
Fuel type	Diesel	
Liters of fuel	38.8	l/100 km
Vehicle type	Diesel-powered truck/trailer	
Transport distance	800	km
Capacity utilization (including empty runs)	0.78	mass %
Gross density of products transported	790	kg/m^3
Capacity utilization volume factor	1	

3.4 Product Installation (A5)

The roof board are installed manually under the roofing membrane. Materials required and instructions are provided in the DensDeck® Roof Board Installation Guide. Necessary tools include a knife, cutting gloves, measuring tape, straight edge or T-square, chalk line, and tools to apply adhesive or install fasteners (e.g., screws). These materials are excluded from the study because they are used in many installations and applications and a single installation is unlikely to consume a substantial portion of their operation life. Therefore, they are considered to be negligible. No operational energy use is considered per Part B PCR section 3.13 (UL Environment, 2021).

The installation process considers 7% material loss due to cutting and fitting done manually. Additionally, electricity use from power tools such as reciprocating saws or track saws will contribute negligible to the overall impacts. This installation scrap is accounted in A5 along with the management of packaging waste generated during installation. The EPD considers packaging waste processing routes in the US (e.g., landfill, incineration, recycling) based on PCR Part A, Section 2.8.5, Table 3 (UL Environment, 2022) (Table 3-3).

Table 3-3: Transport to the building site (A4) details

NAME	VALUE	UNITS
Ancillary materials	N/A	kg/m^2
Net freshwater consumption	N/A	m^3/m^2
Other resources	N/A	kg/m^2
Electricity consumption	N/A	kWh/m^2
Other energy carriers	N/A	MJ/m^2

Product loss per functional unit	1.05	kg/m^2
Additional waste materials at the construction site before waste processing, generated by product installation	1.08	kg/m^2
Output materials resulting from on-site waste processing	N/A	kg/m^2
Mass of packaging to end-of-life	0.0236	kg/m^2
Biogenic carbon contained in packaging	0.0433	kg CO_2 /m^2
Direct emissions to ambient air, soil, and water	N/A	kg/m^2
VOC emissions	N/A	kg/m^2

3.4.1 Reference Service Life

The default RSL of 40 years provided by the Part B PCR section 3.6 (UL Environment, 2021) is used in this EPD.

Table 3-4: RSL details

PCR Requirement	Description for 5/8" DensDeck® StormX® Prime Roof Board
Declared product properties (at the gate) and finishes, etc.	As described in Table 1-1
Design application parameters (if instructed by the manufacturer), including references to the appropriate practices and application codes)	Gypsum roof board should be stored, handled, and installed in accordance with GP's storage, handling and installation instructions (available at www.gpgypsum.com), standard building practices and all applicable building codes.
An assumed quality of work, when installed in accordance with the manufacturer's instructions	Building industry good practices should be followed regarding handling, finishing, storage, and maintenance.
Outdoor environment, (if relevant for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature	Apply only as many DensDeck® Roof Boards as can be covered by a roof membrane system in the same day. Normal weather conditions that excludes things like impacts with objects, high force winds, earthquake, flood, fire or other acts of God or nature.
Indoor environment, (if relevant for indoor applications), e.g. temperature, moisture, chemical exposure)	N/A
Use conditions, e.g. frequency of use, mechanical exposure.	Gypsum roof board is used continuously throughout its lifetime, and as a non-structural component it is not intended to be exposed to significant mechanical stress.
Maintenance, e.g. required frequency, type and quality of replacement components	No general maintenance is required, but the overlying roof is assumed to be replaced after 20 years. Replacement components should be the same type and quality as the original components.

3.5 Use (B4)

Per the Part B PCR section 3.5 (UL Environment, 2021), modules B1, B2, B3, B5, B6, and B7 are assumed to be zero. A total of 0.9 manual replacements are required in module B4 based on the default RSL of 40 years and the building ESL of 75 years (rounded up to the nearest tenth) as shown in Table 3-5. The replacement of the gypsum board uses the same assumptions for installation and deconstruction as the initial installation in A5 and the final deconstruction in C1.

Table 3-5: Replacement (B4) details

NAME	VALUE	UNITS
RSL	40	Years
ESL	75	Years
Replacement cycle (rounded up to nearest tenth)	0.9	(ESL/RSL) - 1
Energy inputs	N/A	kWh/m^2
Net freshwater consumption	N/A	m^3/m^2
Ancillary materials	N/A	kg/m^2
Replacement of worn parts	N/A	kg/m^2
Direct emissions to ambient air, soil, and water	N/A	kg/m^2

3.6 Disposal

After manual deconstruction, the product is collected with mixed construction waste and transported 161 km to a landfill and disposed (Table 3-6).

Table 3-16: Disposal details

NAME	VALUE	UNITS
Mass of waste collected with mixed construction waste	15	kg/m^2
Mass of waste disposed in landfill	15	kg/m^2
Removals of biogenic carbon (excluding packaging)	N/A	kg CO_2/ m^2

4 Environmental Indicators Derived from LCA

The impact categories and methodologies required by the Part A PCR section 4.7 (UL Environment, 2022) were used. The life cycle impact assessment (LCIA) used IPCC AR5 (IPCC, 2014) and AR6 (IPCC, 2023) for global warming excluding biogenic CO_2, TRACI v2.1 (US EPA, 2024) for acidification, eutrophication, ozone depletion, and smog formation, and CML v4.7 (CML, 2016) was used for abiotic resource depletion, fossil. LCIA results are shown by module in Table 4-1. These six impact categories are globally deemed mature enough to be included in Type III environmental declarations. Other categories are being developed and defined and LCA should continue making advances in their development, however the EPD users shall not use additional measures for comparative purposes. LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Since deconstruction is assumed to be manual, there are no impacts associated with module C1, and since all the gypsum is landfilled at end-of-life, there are no impacts associated with module C3.

Table 4-1: LCIA results for 5/8" DensDeck® StormX® Prime Roof Board

	A1 to A3	A4	A5	B4	C2	C4
Global Warming (AR6) [kg CO2 eq.]	6.28E+000	9.32E-001	5.47E-001	7.38E+000	2.45E-001	2.31E-001
Global Warming (AR5) [kg CO2 eq.]	6.43E+000	9.47E-001	5.61E-001	7.54E+000	2.49E-001	2.35E-001
Acidification [kg SO2 eq.]	6.29E-003	4.61E-003	9.43E-004	1.24E-002	6.46E-004	1.41E-003
Eutrophication [kg N eq.]	3.85E-003	3.51E-004	3.09E-004	4.17E-003	5.65E-005	6.77E-005
Ozone Depletion [kg CFC 11 eq.]	2.39E-008	4.18E-014	1.68E-009	2.31E-008	8.88E-015	5.23E-014
Smog Formation [kg O3 eq.]	1.80E-001	1.05E-001	2.30E-002	3.11E-001	1.43E-002	2.62E-002
Abiotic Resource Depletion, Fossil [MJ]	8.66E+001	1.18E+001	7.32E+000	1.00E+002	3.12E+000	2.93E+000

Resource use indicators are shown in Table 4-2.

Table 4-2: Resource use results for 5/8" DensDeck® StormX® Prime Roof Board

	A1 to A3	A4	A5	B4	C2	C4
RPRe [MJ]	7.65E+000	4.97E-001	6.21E-001	8.48E+000	1.28E-001	5.82E-001
RPRm [MJ]	3.48E-001	0.00E+00	2.43E-002	3.35E-001	0.00E+00	0.00E+00
NRPRe [MJ]	8.78E+001	1.20E+001	7.43E+000	1.02E+002	3.15E+000	3.02E+000
NRPRm [MJ]	1.56E+000	0.00E+00	1.09E-001	1.51E+000	0.00E+00	0.00E+00
RE [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SM [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m3]	5.19E-002	5.37E-004	3.75E-003	5.13E-002	1.37E-004	7.28E-004

Output and waste flows are shown in Table 4-3.

Table 4-3: Output and waste results for 5/8" DensDeck® StormX® Prime Roof Board

	A1 to A3	A4	A5	B4	C2	C4
HWD [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD [kg]	1.70E-001	0.00E+00	1.08E+000	1.37E+001	0.00E+00	1.50E+001
HLRW [kg]	7.43E-006	4.88E-008	5.27E-007	7.25E-006	1.15E-008	3.33E-008
ILLRW [kg]	7.40E-004	4.10E-005	5.77E-005	7.90E-004	9.64E-006	3.20E-005
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR [kg]	7.12E-001	0.00E+00	5.65E-002	6.92E-001	0.00E+00	0.00E+00
MER [kg]	0.00E+00	0.00E+00	3.64E-003	3.28E-003	0.00E+00	0.00E+00
EEE [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Biogenic carbon removals and emissions are shown in Table 4-4.

Table 4-4: Output and waste results for 5/8" DensDeck® StormX® Prime Roof Board

	A1 to A3	A4	A5	B4	C2	C4
BCRP [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCEP [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCRK [kg]	4.34E-002	0.00E+00	3.04E-003	4.18E-002	0.00E+00	0.00E+00
BCEK [kg]	0.00E+00	0.00E+00	4.64E-002	4.18E-002	0.00E+00	0.00E+00
BCEW [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CCE [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CCR [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CWNR [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

4.1 Interpretation

The EPD results found that the replacement stage (B4) had the highest contribution to the environmental impacts because it requires 0.9 replacements. The product stage was otherwise the largest contributor primarily due to the raw materials and energy used during manufacturing. It should also be noted that the results represent a weighted average result, and results from products manufactured at different specific facilities may vary.

5 Additional Environmental Information

5.1 Environment and Health During Manufacturing

All environmental, health and safety regulatory requirements are met during the manufacture of 5/8" DensDeck® StormX® Prime Roof Board.

5.2 Environment and Health During Installation

Information about environment and health during installation of 5/8" DensDeck® StormX® Prime Roof Board can be found at www.buildgp.com.

5.3 Extraordinary Effects

Fire

5/8" DensDeck® StormX® Prime Roof Board is UL Certified and has FM Approvals. Additional information can be found at www.buildgp.com

Water

There are no extraordinary effects on the environment or health following the application of water to the product.

Mechanical Destruction

There are no extraordinary effects on the environment or health following unforeseeable mechanical destruction of the product. 5/8" DensDeck® StormX® Prime Roof Board is non-structural, non-loading

bearing material.

5.4 Delayed Emissions

No quantitative or qualitative information on delayed emissions used to calculate Global Warming Potential are declared.

5.5 Environmental Activities and Certification

N/A

5.6 Further Information

Additional information and explanatory material, such as the DensDeck® Roof Board Installation Guide, product safety data sheets, and health product declarations can be found at www.buildgp.com.

6 References

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