




Environmental Product Declaration

BlueGlass Sheathing Board - 1/2 inch and 5/8 inch



Program Operator	NSF Certification LLC 789 N. Dixboro, Ann Arbor, MI 48105 www.nsf.org	
Manufacturer Name and Address	Cabot Gypsum ULC 221 Henry Paint Street Point Tupper, Nova Scotia B9A 1Y7	
Declaration Number	EPD10806	
Declared Product and Declared Unit	92.9 m ² (1,000 square feet) of Cabot Protec BlueGlass Sheathing (1/2 inch and 5/8 inch)	
Reference PCR and Version Number	NSF PCR for Gypsum Panel Products (Version 1.1, 2020)	
Product's Intended Application and Use	Products are designed for exterior cladding and mold, warp, buckle, ripple, and sag resistance	
Product RSL	75 years	
Markets of Applicability	North America	
Date of Issue	1/12/2023	
Period of Validity	5 years from date of issue	
EPD Type	Product Specific	
Range of Dataset Variability	N/A	
EPD Scope	Cradle-to-Gate	
Year of reported manufacturer primary data	2020	
LCA Software and Version Number	GaBi 10.6.1.35	
LCI Database and Version Number	GaBi Database 2021.2	
LCIA Methodology and Version Number	TRACI 2.1 and IPCC AR6	
The sub-category PCR review was conducted by:	<ul style="list-style-type: none"> • Thomas P. Gloria, Industrial Ecology Consultants • Bill Stough, Sustainable Research Group • Jack Geibig, EcoForm 	
<p>This declaration was independently verified in accordance with ISO 14025: 2006. The NSF PCR for Gypsum Panel Products (Version 1.1) serves as the core PCR.</p> <p><input type="checkbox"/> Internal <input checked="" type="checkbox"/> External</p>	<p>Tony Favilla afavilla@nsf.org</p> 	
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	Lindsay Bonney, WAP Sustainability Consulting, LLC	
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	<p>Jack Geibig - EcoForm jgeibig@ecoform.com</p> 	
<p>Limitations:</p> <p>Environmental declarations from different programs (ISO 14025) may not be comparable. Only EPDs prepared from cradle-to-grave life-cycle results and based on the same function, reference service life, based on the same scenarios, and quantified by the same functional unit, and meeting all the conditions in ISO 14025, Section 6.7.2 and ISO 21930 can be used to assist purchasers and users in making informed comparisons between products. Full conformance with the NSF PCR for Gypsum Panel Products, which is compatible with ISO 21930, 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. Additional information on the life cycle assessment can be found by contacting Cabot Gypsum directly via https://cabotgypsum.com/index.php/en/contact-us.</p>		

Description of Company

Cabot Gypsum (“Cabot”) is headquartered in Point Tupper, Nova Scotia, Canada. Cabot’s current product mix includes regular and fire rated products, mold and moisture resistant products, abuse resistant products, vinyl ceiling tiles, and exterior sheathing products. Cabot’s natural gypsum comes from local quarries and gypsum recycling facilities.

Product Description

Cabot Protec BlueGlass Sheathing was developed to withstand extended exposure in normal weather conditions during both commercial and residential construction. This product is available as either 1/2-inch or 5/8-inch board with the proprietary formula providing a fire-resistant and water-resistant gypsum core, which has also been reinforced with glass fibers to further increase resilience. The outer blue lining is a mold-resistant coated fiberglass mat which combats warping, rippling, buckling, and sagging caused by temperature or humidity. Panels have a square edge formation with the ends square-cut. Cabot Protec BlueGlass Sheathing is manufactured by Cabot at its Nova Scotia facility.

The product in this EPD is considered sheathing. The CSI code for this product is 09 29 00 and it falls under the following sub-category as defined by the PCR: gypsum panel products.

Applicable Product Standards

Applicable product standards for gypsum boards include:

- ASTM C11–18b Standard terminology relating to gypsum and related building materials and systems.
- ASTM C1177 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- ASTM C22 / C22M–00(15) Standard Specification for Gypsum.
- ASTM C473–17 Standard Test Methods for Physical Testing of Gypsum Panel Products.
- ASTM C1396 / C1396M–17- Standard Specification for Gypsum Board.
- ASTM D3273–16 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
- ASTM E84–19b Standard Test Method for Surface Burning Characteristics of Building Materials.
- ASTM E119–18ce1 Standard Test Methods for Fire Tests of Building Construction and Materials.

Technical Data

Table 1 shows the technical specifications of the products, including any testing data as appropriate.

Table 1: Technical Details

Parameter	BlueGlass Sheathing Board
Performance	Mold, Moisture, Fire & Water Resistant, Sheathing Board
Mold and Mildew Resistance	These products scored the best possible scores when tested in accordance with ASTM D 3273 (score of 10).
Edge(s)	Squared
Thicknesses	1/2 inch; 5/8 inch
Widths	48"
Color	Blue
Core	Fire-resistant, water-resistant gypsum core, reinforced with glass fibers

Manufacturing

Gypsum arrives at the manufacturing plant and is introduced to the system through a grided opening, sent on through a hammer mill, and then conveyed into a pebble bin. This material is then calcined and ground to proper specifications. The calcined gypsum is then conveyed into the stucco holding bin and transported into the additive mix. Here, water and additives are introduced. After blending, face and back mats are glued. The board is cut to the specified length and sent to the stacker before shipment.

Material Composition

The compositions of the products were obtained from Cabot associates and are presented in Table 2. The raw materials for the product were obtained from various suppliers across North America. The products under review are packaged with plastic bags and air bags.

Table 2: Material Composition

	BlueGlass Sheathing 1/2 inch	BlueGlass Sheathing 5/8 inch
Natural Gypsum, including virgin and reclaimed	50-60%	50-60%
Water	40-50%	40-50%
Face/Backing Material	0-5%	0-5%
Other Materials	0-5%	0-5%

LIFE CYCLE ASSESSMENT BACKGROUND INFORMATION

Declared Unit

The declared unit is 92.9 m² (1,000 square feet) of gypsum board. The products reviewed are designed to provide extra protection against fire, water, temperature, and humidity. Applications include mechanical attachment to framing or as a substrate for exterior claddings.

Table 3: Declared Unit

	BlueGlass Sheathing Board 1/2 inch	BlueGlass Sheathing Board 5/8 inch
Mass per declared unit [kg]	916	1,166

System Boundary

This is a Cradle-to-Gate study. An overview of the system boundary is shown in Figure 1 and a summary of the life cycle modules included in this EPD is presented in Table 4. Infrastructure flows have been excluded.

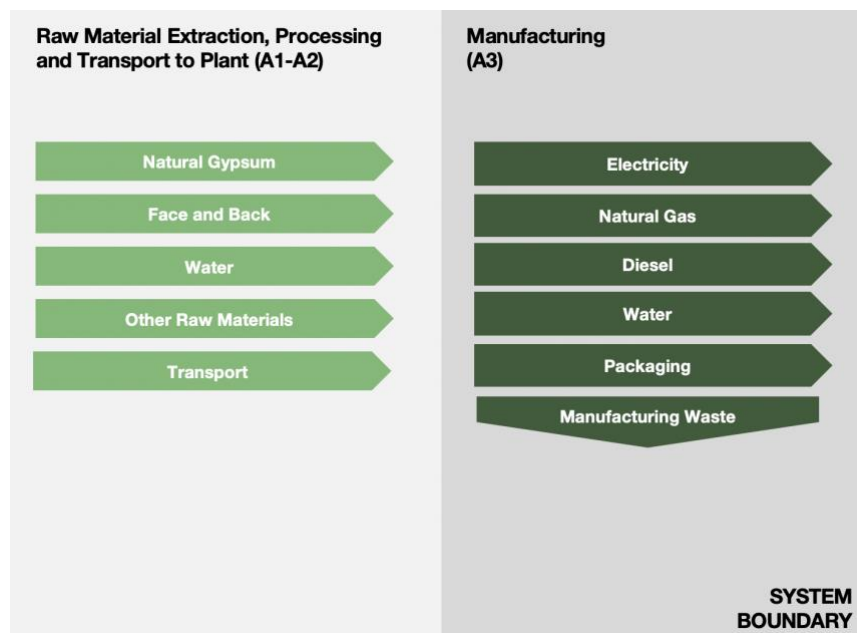


Figure 1: System Boundary

Table 4: Life Cycle Stages Included in the Study

Production			Construction		Use							End of Life				Benefits & Loads Beyond 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 to Site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction	Transport	Waste Processing	Disposal	Reuse, Recovery, Recycling Potential
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

This study does not include the impacts associated with installation, use, maintenance, repair, operational energy and water use, replacement, refurbishment, and disposal.

Cut-off Criteria

Material inputs greater than 1% (based on total mass of the final product) were included within the scope of the analysis. Material inputs less than 1% were included if sufficient data were available to warrant inclusion and/or the material input was thought to have significant environmental impact. Cumulative excluded material inputs and environmental impacts are less than 5% based on total weight of the declared unit. No known flows were deliberately excluded from this EPD.

Allocation

General principles of allocation were based on ISO 14040/44.

To derive a per-unit value for the manufacturing inputs, such as electricity, thermal energy and water, allocation based on total production by mass was adopted. Inputs per-kilogram of product were then scaled according to the weight of each product per functional unit.

As a default, secondary GaBi datasets use a physical mass basis for allocation.

LIFE CYCLE ASSESSMENT RESULTS

All results are given per declared unit, which is 92.9 m² of sheathing board. Environmental impacts were calculated using the GaBi software platform. Impact results have been calculated using the TRACI 2.1 and IPCC AR6 impact assessment methodologies. Results presented in this report are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

Table 5: LCIA Indicators

Abbreviation	Parameter	Unit
TRACI 2.1		
AP	Acidification potential of soil and water	kg SO ₂ eq
EP	Eutrophication potential	kg N eq
GWP	Global warming potential (100 years, includes biogenic CO ₂)	kg CO ₂ eq
ODP	Depletion of stratospheric ozone layer	kg CFC 11 eq
ADP_{fossil}	Depletion of non-renewable fossil fuels	MJ, surplus energy
SFP	Smog formation potential	kg O ₃ eq
IPCC AR6		
GWP, excl	GWP100, excl biogenic carbon	kg CO ₂ eq
GWP, incl	GWP100, incl biogenic carbon	kg CO ₂ eq

Table 6: Biogenic Carbon Indicators

Abbreviation	Parameter	Unit
BCRP	Biogenic Carbon Removal from Product	[kg CO ₂]
BCEP	Biogenic Carbon Emission from Product	[kg CO ₂]
BCRK	Biogenic Carbon Removal from Packaging	[kg CO ₂]
BCEK	Biogenic Carbon Emission from Packaging	[kg CO ₂]
BCEW	Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	[kg CO ₂]
CCE	Calcination Carbon Emissions	[kg CO ₂]
CCR	Carbonation Carbon Removals	[kg CO ₂]
CWNR	Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes	[kg CO ₂]

Table 7: Resource Use, Waste, and Output Flow Indicators

Abbreviation	Parameter	Unit
Resource Use Parameters		
RPR_E	Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value (LHV)
RPR_M	Use of renewable primary energy resources used as raw materials	MJ, net calorific value
RPR_T	Total use of renewable primary energy resources	MJ, net calorific value
NRPR_E	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value
NRPR_M	Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value
NRPR_T	Total use of non-renewable primary energy resources	MJ, net calorific value

Abbreviation	Parameter	Unit
SM	Use of secondary materials	kg
RSF	Use of renewable secondary fuels	MJ, net calorific value
NRSF	Use of non-renewable secondary fuels	MJ, net calorific value
RE	Recovered energy	MJ, net calorific value
FW	Net use of fresh water	m ³
Waste Parameters and Output Flows		
HWD	Disposed-of-hazardous waste	kg
NHWD	Disposed-of non-hazardous waste	kg
HLRW	High-level radioactive waste, conditioned, to final repository	kg
ILLRW	Intermediate- and low-level radioactive waste, conditioned, to final repository	kg
CRU	Components for reuse	kg
MR	Materials for recycling	kg
MER	Materials for energy recovery	kg
EEE	Exported electrical energy	MJ
EET	Exported thermal energy	MJ

The user of the EPD should take care when comparing EPDs from different companies. Assumptions, data sources, and assessment tools may all impact the variability of the final results and make comparisons misleading. Without understanding the specific variability, the user is therefore, not encouraged to compare EPDs.

BlueGlass Sheathing Board 1/2 inch

The LCIA results presented below are for 92.9 m² (1,000 square feet) of sheathing board.

Impact Category	Total A1-A3	A1	A2	A3
TRACI LCIA Impacts (North America)				
AP [kg SO ₂ eq]	9.10E-01	8.15E-02	5.13E-01	3.16E-01
EP [kg N eq]	6.48E-02	5.31E-03	2.26E-02	3.69E-02
GWP, incl biogenic carbon [kg CO ₂ eq]	2.83E+02	5.21E+01	3.02E+01	2.00E+02
ODP [kg CFC 11 eq]	4.05E-07	4.05E-07	5.77E-14	1.17E-13
ADP-fossil fuel [MJ]	5.81E+02	1.34E+02	5.69E+01	3.90E+02
SFP [kg O ₃ eq]	1.83E+01	1.52E+00	1.03E+01	6.50E+00
IPCC AR6				
GWP100, excl biogenic carbon [kg CO ₂ eq.]	2.86E+02	5.27E+01	3.09E+01	2.02E+02
GWP100, incl biogenic carbon [kg CO ₂ eq.]	2.86E+02	5.26E+01	3.04E+01	2.03E+02
Carbon Emissions and Uptake				
BCRP [kg CO ₂]	-	-	-	-
BCEP [kg CO ₂]	-	-	-	-
BCRK [kg CO ₂]	-	-	-	-
BCEK [kg CO ₂]	-	-	-	-
BCEW [kg CO ₂]	-	-	-	-
CCE [kg CO ₂]	-	-	-	-
CCR [kg CO ₂]	-	-	-	-
CWNR [kg CO ₂]	-	-	-	-

Impact Category	Total A1-A3	A1	A2	A3
Resource Use Indicators				
RPR _E [MJ]	2.01E+02	5.79E+01	1.67E+01	1.27E+02
RPR _M [MJ]	-	-	-	-
RPR _T [MJ]	2.01E+02	5.79E+01	1.67E+01	1.27E+02
NRPR _E [MJ]	4.46E+03	1.05E+03	4.30E+02	2.98E+03
NRPR _M [MJ]	6.57E-01	6.45E-01	-	1.21E-02
NRPR _T [MJ]	4.46E+03	1.05E+03	4.30E+02	2.98E+03
SM [kg]	-	-	-	-
RSF [MJ]	-	-	-	-
NRSF [MJ]	-	-	-	-
RE [MJ]	-	-	-	-
FW [m ³]	4.96E-01	2.55E-01	6.00E-02	1.81E-01
Output Flows and Waste Categories				
HWD [kg]	2.55E-07	8.49E-08	1.79E-09	1.68E-07
NHWD [kg]	3.98E+00	3.71E-01	3.69E-02	3.57E+00
HLRW [kg]	2.25E-05	1.99E-05	1.41E-06	1.22E-06
ILLRW [kg]	2.11E-02	1.88E-02	1.19E-03	1.08E-03
CRU [kg]	-	-	-	-
MR [kg]	-	-	-	-

Impact Category	Total A1-A3	A1	A2	A3
MER [kg]	-	-	-	-
EEE [MJ]	2.92E-01	-	-	2.92E-01
EET [MJ]	1.37E-01	-	-	1.37E-01

BlueGlass Sheathing Board 5/8 inch

The LCIA results presented below are for 92.9 m² (1,000 square feet) of gypsum board.

Impact Category	Total A1-A3	A1	A2	A3
TRACI LCIA Impacts (North America)				
AP [kg SO ₂ eq]	1.15E+00	1.08E-01	6.39E-01	4.02E-01
EP [kg N eq]	8.14E-02	6.89E-03	2.78E-02	4.66E-02
GWP, incl biogenic carbon [kg CO ₂ eq]	3.57E+02	6.69E+01	3.56E+01	2.55E+02
ODP [kg CFC 11 eq]	5.84E-07	5.84E-07	6.80E-14	1.48E-13
ADP-fossil fuel [MJ]	7.35E+02	1.72E+02	6.70E+01	4.96E+02
SFP [kg O ₃ eq]	2.30E+01	1.98E+00	1.28E+01	8.27E+00
IPCC AR6				
GWP100, excl biogenic carbon [kg CO ₂ eq.]	3.62E+02	6.78E+01	3.64E+01	2.58E+02
GWP100, incl biogenic carbon [kg CO ₂ eq.]	3.61E+02	6.76E+01	3.57E+01	2.58E+02
Carbon Emissions and Uptake				
BCRP [kg CO ₂]	-	-	-	-
BCEP [kg CO ₂]	-	-	-	-
BCRK [kg CO ₂]	-	-	-	-
BCEK [kg CO ₂]	-	-	-	-
BCEW [kg CO ₂]	-	-	-	-
CCE [kg CO ₂]	-	-	-	-
CCR [kg CO ₂]	-	-	-	-
CWNR [kg CO ₂]	-	-	-	-

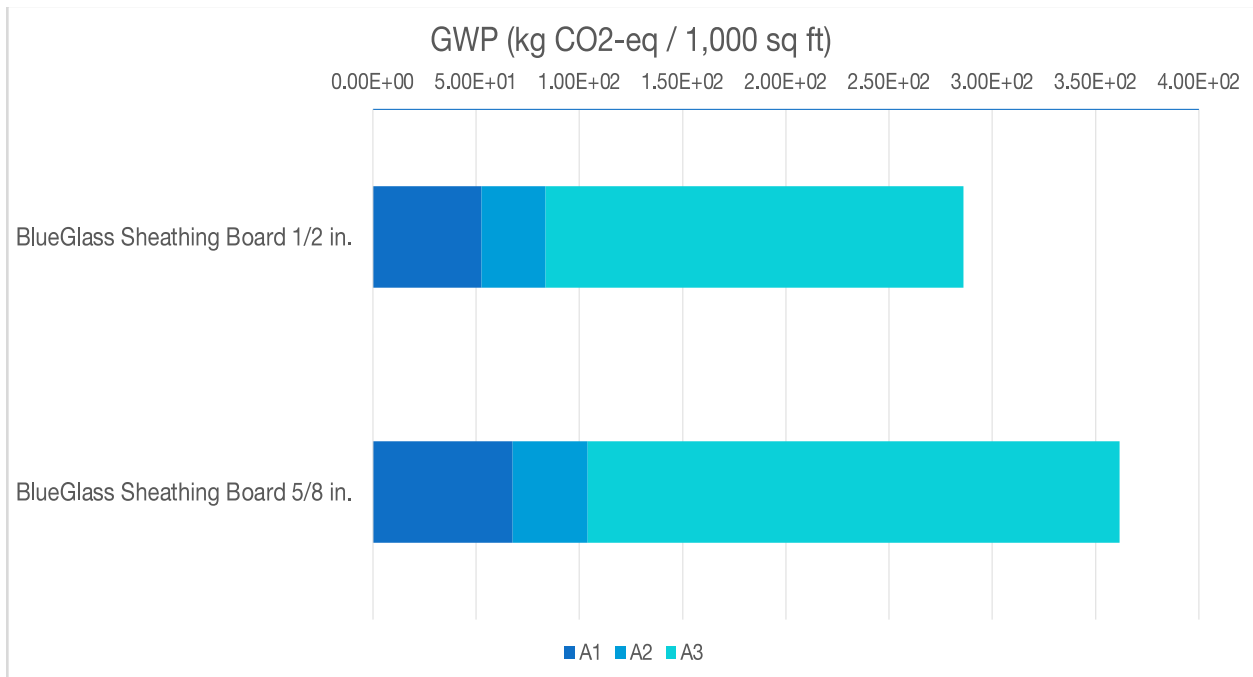
Impact Category	Total A1-A3	A1	A2	A3
Resource Use Indicators				
RPR _E [MJ]	2.53E+02	7.18E+01	1.97E+01	1.61E+02
RPR _M [MJ]	-	-	-	-
RPR _T [MJ]	2.53E+02	7.18E+01	1.97E+01	1.61E+02
NRPR _E [MJ]	5.64E+03	1.34E+03	5.06E+02	3.79E+03
NRPR _M [MJ]	9.46E+00	9.44E+00	0.00E+00	1.24E-02
NRPR _T [MJ]	5.65E+03	1.35E+03	5.06E+02	3.79E+03
SM [kg]	1.00E+00	1.00E+00	-	-
RSF [MJ]	-	-	-	-
NRSF [MJ]	-	-	-	-
RE [MJ]	-	-	-	-
FW [m ³]	6.10E-01	3.09E-01	7.07E-02	2.30E-01
Output Flows and Waste Categories				

Impact Category	Total A1-A3	A1	A2	A3
HWD [kg]	3.11E-04	3.11E-04	2.10E-09	2.14E-07
NHWD [kg]	5.04E+00	4.66E-01	4.35E-02	4.53E+00
HLRW [kg]	2.98E-05	2.66E-05	1.66E-06	1.54E-06
ILLRW [kg]	2.73E-02	2.45E-02	1.40E-03	1.36E-03
CRU [kg]	-	-	-	-
MR [kg]	-	-	-	-
MER [kg]	-	-	-	-
EEE [MJ]	3.71E-01	-	-	3.71E-01
EET [MJ]	1.75E-01	-	-	1.75E-01

LIFE CYCLE ASSESSMENT INTERPRETATION

A dominance analysis was performed for all products in the LCA to show which of the life cycle modules contributes to the majority of the impacts. Due to the relevance of this impact category to the product type and the manufacturer's interests, this dominance analysis is provided for IPCC AR6 Global Warming Potential (GWP) 100, excluding biogenic carbon results.

Global warming potential (GWP) is a measure of how much heat a greenhouse gas traps in the atmosphere up to a specified time horizon and measured relative to carbon dioxide.



The dominance analysis shows that the impacts from raw material extraction (A1) and manufacturing (A3) average 20% and 70%, respectively, while impacts from transportation (A2) are significantly lower (10%). At a more granular level, we find natural gypsum and the facer/backer are the largest contributors to A1 impacts at 11% and 4% of overall emissions, respectively. The emissions sources contributing the most within the manufacturing stage (A3) are natural gas and electricity usage at the manufacturing facility, accounting for 52% and 18% of overall emissions, respectively.

REFERENCES

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7. ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services.