



# *Environmental Product Declaration*

Type X Core Gypsum Board 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	EPD10807	
Declared Product and Declared Unit	92.9 m <sup>2</sup> (1,000 square feet) of Type X Core Board (5/8 inch)	
Reference PCR and Version Number	NSF PCR for Gypsum Panel Products (Version 1.1, 2020)	
Product's Intended Application and Use	Product is designed for interior walls and ceilings, and fire protection.	
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"> <li>• Thomas P. Gloria, Industrial Ecology Consultants</li> <li>• Bill Stough, Sustainable Research Group</li> <li>• Jack Geibig, EcoForm</li> </ul>	
<p>This declaration was independently verified in accordance with ISO 14025: 2006. The NSF PCR for Gypsum Panel Products (Version 1.1, 2020) 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 <a href="https://cabotgypsum.com/index.php/en/contact-us">https://cabotgypsum.com/index.php/en/contact-us</a>.</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 Type X Core Gypsum Board is designed for use with most walls, partitions and ceilings in both new commercial and residential construction and remodeling work. It consists of a noncombustible core, which is further enhanced with glass fibers to provide greater strength and fire protection for interior walls and ceilings. The face layer consists of 100% recycled ivory colored paper, which is formed along each edge, wrapped around and sealed to the brown paper on the back side. This board comes from the factory as a ready-to-finish product. Type X Core Gypsum Board is manufactured by Cabot at its Nova Scotia facility.

The product in this EPD is considered a gypsum board product. 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 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 C1658 – Standard Specification for Glass Mat Gypsum Panels.
- 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 product, including any testing data as appropriate.

Table 1: Technical Details

Parameter	Type X Core
Performance	Shaftliner, Mold & Moisture Resistant, fiberglass mat
Edge	Tapered, Square
Thickness	5/8 inch
Width	48"
Color	Ivory, Brown
Core	Non-combustible

## 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, bundled with end tape, and sent to the stacker before shipment.

## Material Composition

The composition of the product was obtained from Cabot associates and is presented in Table 2. The raw materials for the product were obtained from various suppliers across North America. The product under review is packaged with end tape, tear tape, plastic bags, and air bags.

Table 2: Material Composition

	Type X Core
Natural Gypsum, including virgin and reclaimed	50-60%
Water	40-50%
Fiberglass	0-5%
Other Materials	0-5%

# LIFE CYCLE ASSESSMENT BACKGROUND INFORMATION

## Declared Unit

The declared unit is 92.9 m<sup>2</sup> (1,000 square feet) of gypsum board. This product is used to provide greater strength and fire protection for interior walls and ceilings. Applications include wood framing and light gauge metal framing.

Table 3: Declared Unit

	Type X Core
Mass per declared unit [kg]	1,021

## 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.

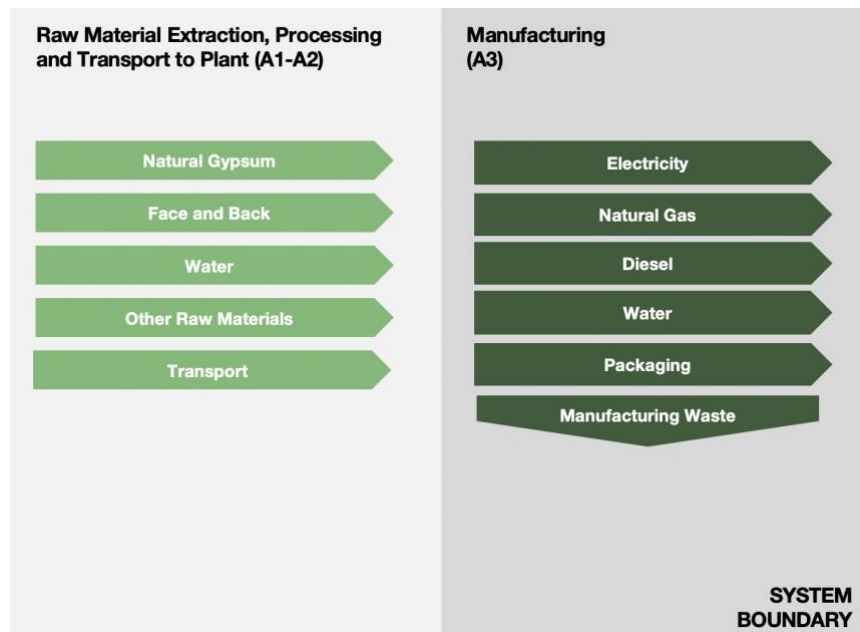


Figure 1: System Boundary

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 m<sup>2</sup> of gypsum 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
<b>TRACI 2.1</b>		
<b>AP</b>	Acidification potential of soil and water	kg SO <sub>2</sub> eq
<b>EP</b>	Eutrophication potential	kg N eq
<b>GWP</b>	Global warming potential (100 years, includes biogenic CO <sub>2</sub> )	kg CO <sub>2</sub> eq
<b>ODP</b>	Depletion of stratospheric ozone layer	kg CFC 11 eq
<b>ADP<sub>fossil</sub></b>	Depletion of non-renewable fossil fuels	MJ, surplus energy
<b>SFP</b>	Smog formation potential	kg O <sub>3</sub> eq
<b>IPCC AR6</b>		
<b>GWP, excl</b>	GWP100, excl biogenic carbon	kg CO <sub>2</sub> eq
<b>GWP, incl</b>	GWP100, incl biogenic carbon	kg CO <sub>2</sub> eq

*Table 6: Biogenic Carbon Indicators*

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

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

Abbreviation	Parameter	Unit
<b>Resource Use Parameters</b>		
<b>RPR<sub>E</sub></b>	Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value (LHV)
<b>RPR<sub>M</sub></b>	Use of renewable primary energy resources used as raw materials	MJ, net calorific value
<b>RPR<sub>T</sub></b>	Total use of renewable primary energy resources	MJ, net calorific value
<b>NRPR<sub>E</sub></b>	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value
<b>NRPR<sub>M</sub></b>	Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value
<b>NRPR<sub>T</sub></b>	Total use of non-renewable primary energy resources	MJ, net calorific value
<b>SM</b>	Use of secondary materials	kg

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



## Type X Core 5/8 Inch

The LCIA results presented below are for 92.9 m<sup>2</sup> (1,000 square feet) of gypsum board.

Impact Category	Total A1-A3	A1	A2	A3
<b>TRACI LCIA Impacts (North America)</b>				
AP [kg SO <sub>2</sub> eq]	1.07E-01	1.53E-01	5.70E-01	3.52E-01
EP [kg N eq]	1.16E-01	5.12E-02	2.42E-02	4.08E-02
GWP, incl biogenic carbon [kg CO <sub>2</sub> eq]	2.46E+02	-1.01E+00	2.40E+01	2.23E+02
ODP [kg CFC 11 eq]	3.34E-07	3.34E-07	4.61E-14	1.30E-13
ADP-fossil fuel [MJ]	5.97E+02	1.17E+02	4.54E+01	4.34E+02
SFP [kg O <sub>3</sub> eq]	2.25E+01	3.43E+00	1.19E+01	7.24E+00
<b>IPCC AR6</b>				
GWP100, excl biogenic carbon [kg CO <sub>2</sub> eq.]	3.15E+02	6.44E+02	2.47E+01	2.25E+02
GWP100, incl biogenic carbon [kg CO <sub>2</sub> eq.]	2.50E+02	-5.56E-01	2.42E+01	2.26E+02
<b>Carbon Emissions and Uptake</b>				
BCRP [kg CO <sub>2</sub> ]	2.84E+01	2.84E+01	-	-
BCEP [kg CO <sub>2</sub> ]	-	-	-	-
BCRK [kg CO <sub>2</sub> ]	4.04E-04	-	-	4.04E-04
BCEK [kg CO <sub>2</sub> ]	-	-	-	-
BCEW [kg CO <sub>2</sub> ]	-	-	-	-
CCE [kg CO <sub>2</sub> ]	-	-	-	-
CCR [kg CO <sub>2</sub> ]	-	-	-	-
CWNR [kg CO <sub>2</sub> ]	-	-	-	-

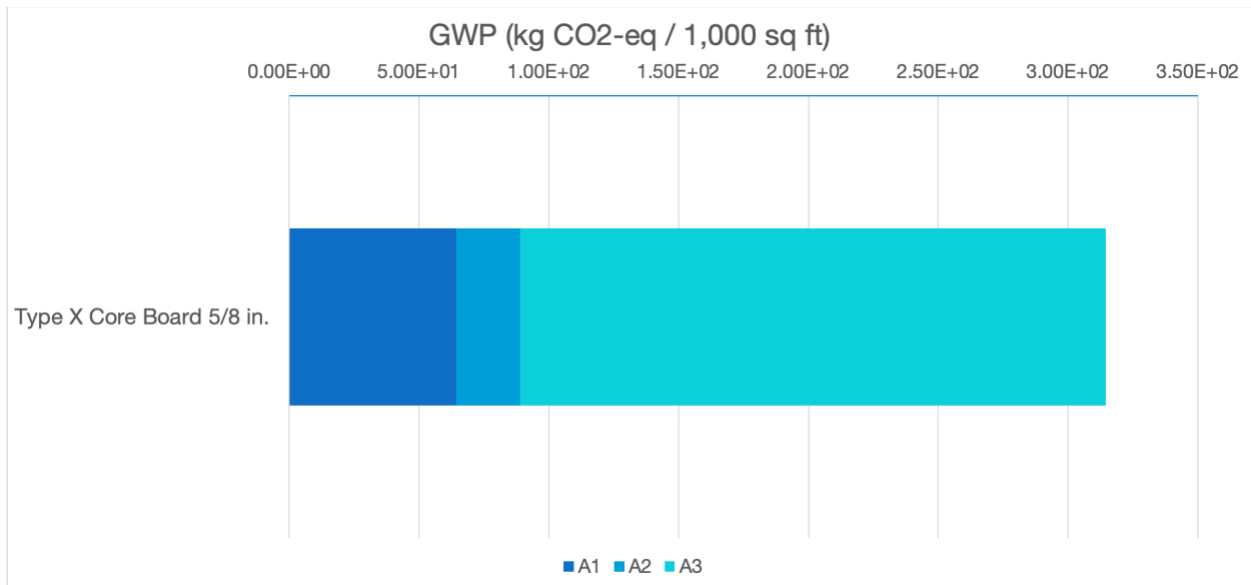
Impact Category	Total A1-A3	A1	A2	A3
<b>Resource Use Indicators</b>				
RPR <sub>E</sub> [MJ]	6.91E+02	5.37E+02	1.33E+01	1.41E+02
RPR <sub>M</sub> [MJ]	7.43E+02	7.43E+02	-	1.44E-03
RPR <sub>T</sub> [MJ]	1.43E+03	1.28E+03	1.33E+01	1.41E+02
NRPR <sub>E</sub> [MJ]	4.60E+03	9.34E+02	3.43E+02	3.32E+03
NRPR <sub>M</sub> [MJ]	3.73E+01	3.73E+01	-	1.55E-02
NRPR <sub>T</sub> [MJ]	4.63E+03	9.71E+02	3.43E+02	3.32E+03
SM [kg]	-	-	-	-
RSF [MJ]	-	-	-	-
NRSF [MJ]	-	-	-	-
RE [MJ]	-	-	-	-
FW [m <sup>3</sup> ]	1.12E-00	8.73E-01	4.80E-02	2.01E-01
<b>Output Flows and Waste Categories</b>				
HWD [kg]	5.49E-04	5.49E-04	1.43E-09	1.87E-07
NHWD [kg]	5.97E+00	1.98E+00	2.95E-02	3.96E+00
HLRW [kg]	2.95E-05	2.70E-05	1.13E-06	1.35E-06
ILLRW [kg]	3.12E-02	2.91E-02	9.50E-04	1.19E-03
CRU [kg]	-	-	-	-
MR [kg]	-	-	-	-

Impact Category	Total A1-A3	A1	A2	A3
MER [kg]	-	-	-	-
EEE [MJ]	3.25E-01	-	-	3.25E-01
EET [MJ]	1.53E-01	-	-	1.53E-01

## LIFE CYCLE ASSESSMENT INTERPRETATION

A dominance analysis was performed for this product 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) are larger averaging 20% and 72%, respectively, while impacts from transportation (A2) are significantly lower (8%). At a more granular level, we find natural gypsum the largest contributor to A1 impacts at 12% of overall emissions. 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

1. Life Cycle Assessment, LCA Report for Cabot Gypsum – Gypsum Boards. WAP Sustainability Consulting. October 2022.
2. NSF Product Category Rule (PCR) for Gypsum Panel Products Version 1.1 (April 2020)
3. ISO 14040: 2006 Environmental Management – Life cycle assessment – Principles and framework.
4. ISO 14044: 2006 Environmental Management – Life cycle assessment – Requirements and Guidelines.
5. ISO 14044: 2006/ Amd 1:2017 Environmental Management – Life cycle assessment – Requirements and Guidelines – Amendment 1.
6. ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and Procedures.
7. ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services.