# ENVIRONMENTAL PRODUCT DECLARATION

## GOLD BOND® eXP® SHAFTLINER

Certified Environmental Product Declaration
www.nsf.org

ACCORDING TO ISO 14025 AND ISO 21930
Type III environmental product declaration (EPD) developed according to ISO 14025 and 21930 for Gold Bond® eXP® Shaftliner

National Gypsum®

Gold Bond® Gypsum Board

*National Gypsum Company is the exclusive service provider for products manufactured by Gold Bond Building Products, LLC.*

| | |
|---|---|
| Program Operator | NSF Certification LLC<br>789 N. Dixboro, Ann Arbor, MI 48105<br>www.nsf.org |
| Manufacturer Name and Address | Gold Bond Building Products, LLC<br>2001 Rexford Road<br>Charlotte, NC 28211 |
| Declaration Number | EPD11043 |
| Declared Product and Declared Unit | 92.9 $m^2$ (1,000 square feet) of Gold Bond® eXP® Shaftliner 1 inch |
| Reference PCR and Version Number | NSF PCR for Gypsum Panel Products (Version 1.1, 2020) |
| Product's Intended Application and Use | Product is used to construct lightweight fire barriers for cavity shaftwalls and area separation fire walls. Applications include enclosed elevators, horizontal shafts, chase walls, and multi-family housing units. |
| Markets of Applicability | North America |
| Date of Issue | 05/23/2025 |
| 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 10.0.0.71 |
| LCI Database and Version Number | GaBi Database 2021.2 |
| LCIA Methodology and Version Number | TRACI 2.1 |
| The sub-category PCR review was conducted by: | • Thomas P. Gloria, Industrial Ecology Consultants<br>• Bill Stough, Sustainable Research Group<br>• Jack Geibig, EcoForm |
| 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.<br><br>☐ Internal ☒External | Jack Geibig - EcoForm<br>jgeibig@ecoform.com |
| This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by: | Maggie Wildnauer, WAP Sustainability Consulting, LLC |
| This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by: | Jack Geibig - EcoForm<br>jgeibig@ecoform.com |

Limitations:
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, and quantified by the same functional unit, and meeting all the conditions in ISO 14025, Section 6.7.2, can be used to assist purchasers and users in making informed comparisons between products.
Full conformance with the PCR for Products 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 National Gypsum directly.

## DESCRIPTION OF COMPANY

National Gypsum Company, headquartered in Charlotte, NC, is the exclusive service provider of reliable, high-performance building products manufactured by its affiliate companies and marketed under the Gold Bond®, ProForm®, and PermaBASE® brands.

## PRODUCT DESCRIPTION

Use Gold Bond® eXP® Shaftliner to construct lightweight fire barriers for cavity shaftwalls and area separation fire walls. eXP Shaftliner consists of a moisture- and mold resistant gypsum core encased in a coated, specially designed PURPLE fiberglass mat on the face, back and sides. It is available in a Type X core. The glass mat is folded around the long edges to reinforce and protect the core.

This EPD includes a representative product manufactured by National Gypsum's affiliate, Gold Bond Building Products, produced at the facilities shown in the table below. A weighted average of each manufacturing input (energy, water, waste, etc.) was utilized based on 2020 production as products are made at multiple facilities. Therefore, data from any given manufacturing site might be meaningfully different than the values reported in this EPD.

*Table 1: Manufacturing Facilities*

| Manufacturing Plants | Production Share [%] |
|---|---|
| Apollo Beach, FL | 14% |
| Baltimore, MD | 14% |
| Medicine Lodge, KS | 22% |
| Phoenix, AZ | 5% |
| Waukegan, IL | 10% |
| Wilmington, NC | 35% |

Gypsum used in the product is sourced from the plants below. These materials tend to be sourced from the quarry nearest to the wallboard/manufacturing plant but that is not always the case.

*Table 2: Quarries*

| Quarries |
|---|
| Halifax, Nova Scotia |
| Sun City, KS |
| Tawas, MI |
| Winkelman, AZ |

The reviewed product is considered a gypsum board product. The CSI code for this product is 09 29 00. The product included in this study 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.
- ASTM E2921–16a Standard practice for minimum criteria for comparing whole building LCAs for use with building codes, standards, and rating systems.

## TECHNICAL DATA

Table 3 shows the technical specifications of the products, including any testing data as appropriate.

*Table 3: Technical Details*

| Parameter | eXP Shaftliner 1 inch |
|---|---|
| **Performance** | Shaftliner, Mold & Moisture Resistant, fiberglass mat |
| **Mold and Mildew Resistance** | The product scored a 10 when tested in accordance with ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber |
| **Edge** | Beveled |
| **Thickness** | 1 inch |
| **Width** | 24” |
| **Color** | Purple |

## MANUFACTURING

Gypsum arrives at the manufacturing plant and is ground and heated to remove chemically bound water, forming stucco. The stucco is then mixed with water and other materials to make the core. The core is encased in fiberglass facers. The board is then left to harden, maintaining 20-30% moisture, before being cut and put through a drying process. The edges are then trimmed and panels are stacked on risers before the products are distributed.

## MATERIAL COMPOSITION

Unique product compositions were provided for each product and manufacturing site. The average compositions across all manufacturing sites were utilized in the study and are shown in Table 4 below. The raw materials for the product were obtained from various suppliers across North America, in addition to the quarries owned by affiliates of National Gypsum Company. The products under review are packaged with end tape and tear tape before distribution.

*Table 4: Material Composition*

| | eXP Shaftliner 1 inch |
|---|---|
| Gypsum, including internally processed reclaim gypsum | 90 – 100% |
| Paper | 0 – 5% |
| Fiberglass Mat | 0 – 5% |
| Additives | 0 – 5% |

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

This product does not contain substances on the candidate list of SVHC for Authorisation at a percentage higher than 0.1% by mass.

Biogenic carbon contained in the packaging and finished product that are released during installation and end-of-life, respectively, are presented in Table 5.

*Table 5: Biogenic carbon*

| Parameter | kg $CO_2$-eq/Declared Unit |
|---|---|
| Biogenic carbon content of packaging (released at Installation, A5) | 0.0 |
| Biogenic carbon content of product (released at End-of-Life, C4) | 0.312 |

# LIFE CYCLE ASSESSMENT BACKGROUND INFORMATION

## DECLARED UNIT

The declared unit is 92.9 $m^2$ (1,000 square feet) of gypsum board. This product is used to construct lightweight fire barriers for cavity shaftwalls and area separation fire walls. Applications include enclosed elevators, horizontal shafts, chase walls, and multi-family housing units.

*Table 6: Declared Unit*

| | eXP Shaftliner 1 inch |
|---|---|
| **Mass per declared unit [kg]** | 1,926 |

## SYSTEM BOUNDARY

This LCA is a Cradle-to-Gate study. An overview of the system boundary is shown in Figure 1 and a summary of the life cycle stages included in this LCA is presented in Table 7.

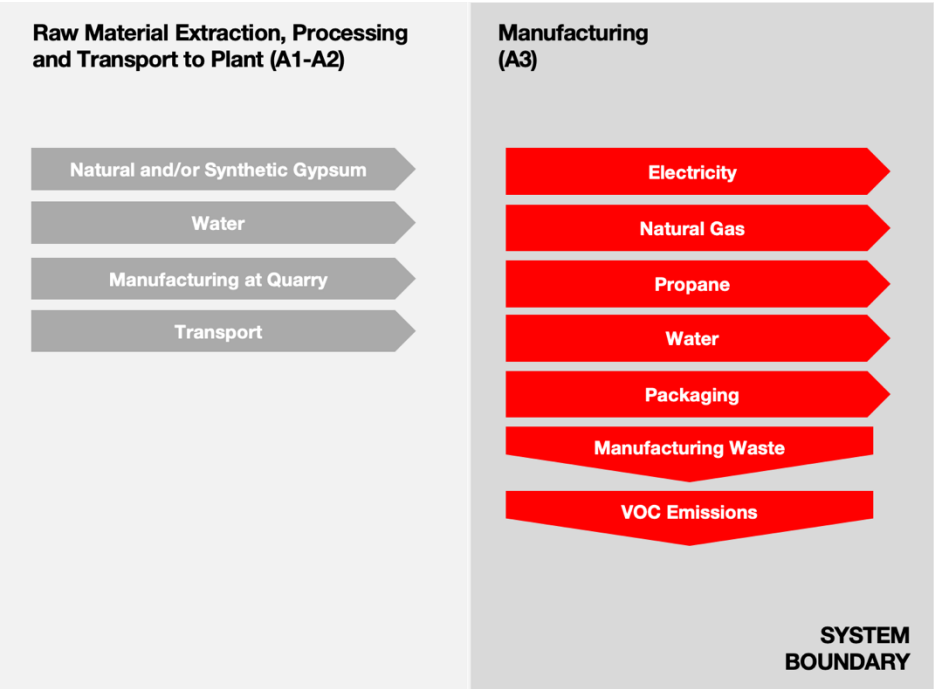



*Figure 1: System Boundary*

A summary of the life cycle modules included in this EPD is presented in Table 7. Infrastructure flows have been excluded.

*Table 7: 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 |

## CUT-OFF CRITERIA

Material or energy inputs greater than 1% (based on total mass of the final product) were included within the scope of the analysis. Material and energy 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 and energy 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/outputs, mass allocation based on total production at each manufacturing facility was adopted. For all plants that make the reviewed product, the total consumption during 2020 was divided by the total production mass during 2020 to derive a weighted-average use-per-production unit value. Gold Bond Building Products' associates determined the best way to allocate inputs. This allocation methodology was used for the following inputs:

- Electricity
- Diesel
- Gasoline
- Thermal Energy from Natural Gas
- Propane
- Water
- Waste

Discussions with Gold Bond Building Products' staff divulged this was a representative way to allocate the manufacturing inputs/outputs due to the fact that all products created at the facilities are similar in nature. 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 $m^2$ of gypsum board. Environmental impacts were calculated using the GaBi software platform. Impact results have been calculated using the TRACI 2.1 impact assessment methodology. 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 8: 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 |
| **GWP** | Global warming potential (100 years, excludes biogenic $CO_2$) | kg $CO_2$ eq |
| **ODP** | Depletion of stratospheric ozone layer | kg CFC 11 eq |
| **ADPfossil** | Depletion of non-renewable fossil fuels | MJ, surplus energy |
| **SFP** | Smog formation potential | kg $O_3$ eq |

*Table 9: Biogenic Carbon Indicators*

| Abbreviation | Parameter | Unit |
|---|---|---|
| **BCRP** | Biogenic Carbon Removal from Product | [kg CO2] |
| **BCEP** | Biogenic Carbon Emission from Product | [kg CO2] |
| **BCRK** | Biogenic Carbon Removal from Packaging | [kg CO2] |
| **BCEK** | Biogenic Carbon Emission from Packaging | [kg CO2] |
| **BCEW** | Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes | [kg CO2] |
| **CCE** | Calcination Carbon Emissions | [kg CO2] |
| **CCR** | Carbonation Carbon Removals | [kg CO2] |
| **CWNR** | Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes | [kg CO2] |

*Table 10: 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 |
| **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 |

| Abbreviation | Parameter | Unit |
|---|---|---|
| **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.

## eXP SHAFTLINER 1 INCH

The LCIA results presented below are for 92.9 $m^2$ (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]** | **0.834** | 0.348 | 0.257 | 0.229 |
| **EP [kg N eq]** | **0.088** | 0.0225 | 0.01145 | 0.0542 |
| **GWP, incl biogenic carbon [kg $CO_2$ eq]** | **476** | 97 | 19.7 | 359 |
| **GWP excl biogenic carbon [kg $CO_2$ eq]** | **472** | 97 | 19.7 | 355 |
| **ODP [kg CFC 11 eq]** | **$1.22x10^{-6}$** | $1.22x10^{-6}$ | $5.45x10^{-14}$ | $5.17x10^{-12}$ |
| **ADP-fossil fuel [MJ]** | **6727** | 1606 | 251.1 | 4870 |
| **SFP [kg $O_3$ eq]** | **15.1** | 6.0 | 4.98 | 4.08 |
| **Carbon Emissions and Uptake** | | | | |
| **BCRP [kg $CO_2$]** | **0.312** | 0.312 | - | - |
| **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 $CO_2$]** | - | - | - | - |

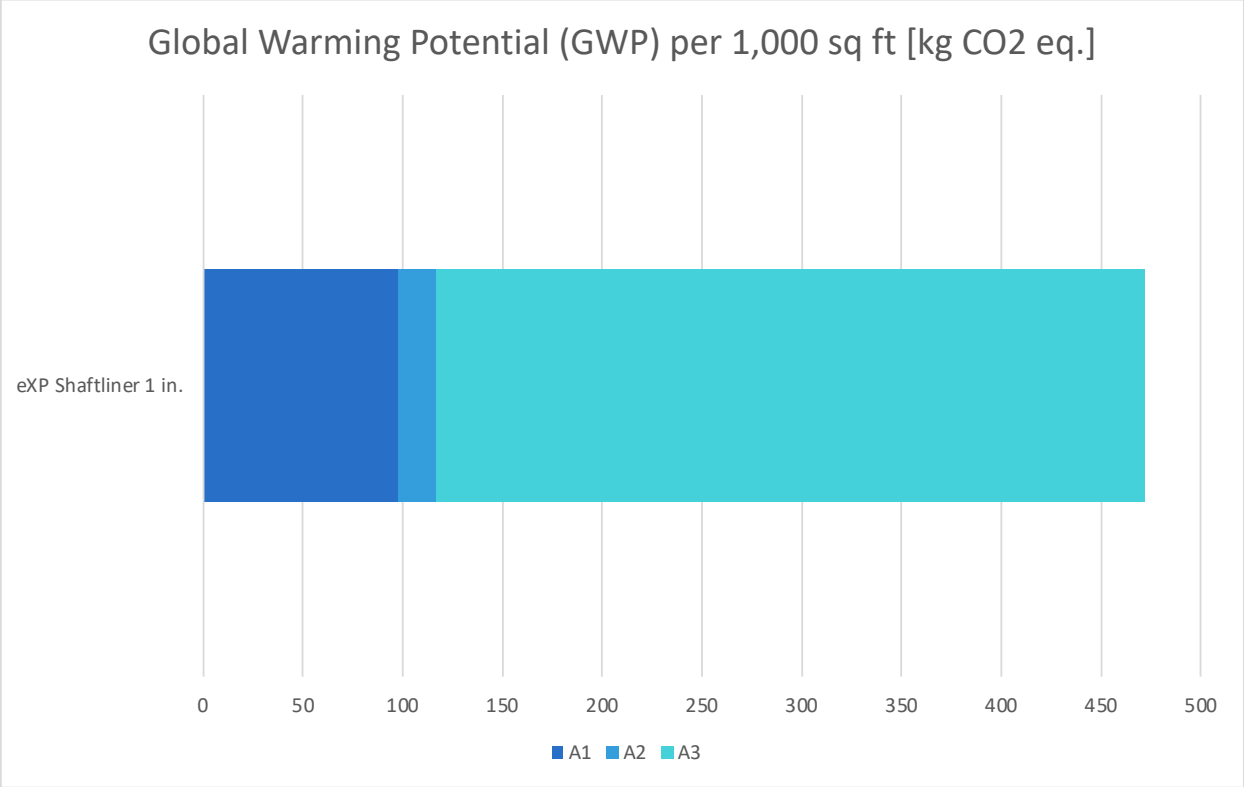
| Impact Category | Total A1-A3 | A1 | A2 | A3 |
|---|---|---|---|---|
| **Resource Use Indicators** | | | | |
| **$RPR_E$ [MJ]** | **511** | 326 | 8 | 176 |
| **$RPR_M$ [MJ]** | **-** | - | - | - |
| **$RPR_T$ [MJ]** | **512** | 328 | 8 | 176 |
| **$NRPR_E$ [MJ]** | **7127** | 1707 | 253 | 5167 |
| **$NRPR_M$ [MJ]** | **-** | - | - | - |
| **$NRPR_T$ [MJ]** | **7127** | 1707 | 253 | 5167 |
| **SM [kg]** | **-** | - | - | - |
| **RSF [MJ]** | **-** | - | - | - |
| **NRSF [MJ]** | **-** | - | - | - |
| **RE [MJ]** | **-** | - | - | - |
| **FW [$m^3$]** | **0.97** | 0.71 | 0.025 | 0.23 |
| **Output Flows and Waste Categories** | | | | |
| **HWD [kg]** | **$5.57x10^{-6}$** | $4.63x10^{-6}$ | $3.43x10^{-8}$ | $9.00x10^{-7}$ |
| **NHWD [kg]** | **45.3** | 7.24 | 0.021 | 38.0 |
| **HLRW [kg]** | **$1.70x10^{-4}$** | $4.38\ x10^{-5}$ | $8.83x10^{-7}$ | $1.26x10^{-4}$ |
| **ILLRW [kg]** | **0.142** | 0.0361 | 0.001 | 0.105 |
| **CRU [kg]** | **-** | - | - | - |
| **MR [kg]** | **8.5** | - | - | 8.5 |
| **MER [kg]** | **-** | - | - | - |
| **EEE [MJ]** | **4.95** | - | - | 4.95 |

| Impact Category | Total A1-A3 | A1 | A2 | A3 |
|---|---|---|---|---|
| **EET [MJ]** | **2.33** | - | - | 2.33 |

# 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 TRACI 2.1 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 manufacturing (A3) are the largest 75%. Raw material extraction (A1) is the next largest contributor (21%), while impacts from transportation (A2) are significantly lower (4%).

Some limitations to the study have been identified as follows:

- Only facility-level data were provided for manufacturing processes. Sub-metering of specific product lines would allow for more accurate manufacturing impacts to be modeled.
- Availability of geographically more accurate datasets would have improved the accuracy of the study.

- Since this LCA uses the cut-off approach to model recycled material in the product, no credit is given to the product system. Instead, the manufacturer realizes reduced environmental impacts through the absence of the burden of extracting virgin material.
- Only known and quantifiable environmental impacts are considered.
- Due to the assumptions and value choices listed above, these do not reflect real-life scenarios and hence they cannot assess actual and exact impacts, but only potential environmental impacts.

# ADDITIONAL ENVIRONMENTAL INFORMATION

## ENVIRONMENTAL ACTIVITIES AND CERTIFICATIONS

Gold Bond Building Products maintains certifications with UL and HPD Collaborative. eXP Shaftliner 1 inch is GREENGUARD Gold certified. Additionally, a Health Product Declaration (“HPD”) was created for this product.

Gypsum boards, if installed and treated properly, will last the lifetime of the building.

# REFERENCES


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