

ENVIRONMENTAL PRODUCT DECLARATION

GOLD BOND® FIRE-SHIELD® GYPSUM BOARD (5/8")
SHIPPINGPORT, PA PLANT






ACCORDING TO ISO 14025 AND ISO 21930
Type III environmental product declaration (EPD) developed according to ISO 14025 and 21930 for
Gold Bond® Fire-Shield® Gypsum Board (5/8")



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



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| Program Operator | NSF Certification LLC 789 N. Dixboro, Ann Arbor, MI 48105 www.nsf.org |  |
| Manufacturer Name and Address | Gold Bond Building Products, LLC 2001 Rexford Road Charlotte, NC 28211 | |
| Declaration Number | EPD11050 | |
| Declared Product and Declared Unit | 92.9 m ² (1,000 square feet) of Gold Bond® Fire-Shield® Gypsum Board (5/8"), Shippingport, PA plant | |
| Reference PCR and Version Number | NSF PCR for Gypsum Panel Products (Version 1.1, 2020). This type III EPD is developed according to ISO 14025:2006 and ISO 21930:2017. | |
| Product's Intended Application and Use | Product is used on walls and ceilings in fire-rated construction where the framing members are spaced up to 24" o.c. | |
| 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 | 2022 | |
| LCA Software and Version Number | GaBi 10.0.0.71 | |
| LCI Database and Version Number | GaBi Database 2023.2 | |
| LCIA Methodology and Version Number | TRACI 2.1 | |
| 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 | |
| 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. <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External | Jack Geibig - EcoForm 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 jgeibig@ecoform.com  | |
| <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, 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.</p> <p>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.</p> <p>Additional information on the life cycle assessment can be found by contacting National Gypsum directly.</p> | | |

DESCRIPTION OF COMPANY

National Gypsum Company 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. The National Gypsum name has been synonymous with high-quality, innovative products and exceptional customer service since 1925.

PRODUCT DESCRIPTION

Gold Bond® Fire-Shield® Gypsum Board consists of a fire-resistant gypsum core encased in heavy, natural-finish, 100% recycled paper on the face and back sides. The face paper folds around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth. Fire-Shield Gypsum Board features a Type X core to provide additional fire-resistance ratings when used in laboratory tested systems. Fire-Shield Gypsum Board complies with ASTM C1396 *Standard Specification for Gypsum Board*.

Use on walls and ceilings in fire-rated construction where the framing members are spaced up to 24" o.c.

Product Features:

- Provides additional fire resistance.
- Features a Type X core making it more fire resistant than regular gypsum board.
- Approved component in UL fire-rated designs.
- The gypsum core will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined.
- Lightweight material that readily accepts a wide range of decorative finishes.
- Cuts easily for quick installation.
- Dimensionally stable under changes in temperature and relative humidity and resists warping, rippling, buckling, and sagging.
- Meets ASTM C1396.

This EPD includes a representative product manufactured by National Gypsum's affiliate, Gold Bond Building Products, produced at the facility shown in the table below. Manufacturing inputs (energy, water, waste, etc.) are based on 2022 production.

Table 1: Manufacturing Facility

| Manufacturing Plants |
|----------------------|
| Shippingport, PA |

Paper used in the product is sourced from the plants below. This material tends to be sourced from the paper plant nearest to the gypsum board manufacturing plant but that is not always the case.

Table 2: Paper Plants

| Paper Plants |
|--------------|
| Anniston, AL |

| |
|---------------------|
| Paper Plants |
| Milton, PA |
| Pryor, OK |

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 C473 Standard Test Methods for Physical Testing of Gypsum Panel Products
- ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- ASTM C840 Standard Specification for Application and Finishing of Gypsum Board
- ASTM C1396 Standard Specification for Gypsum Board
- ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials
- ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
- ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 °C
- Gypsum Association, GA-214, Levels of Finish for Gypsum Panel Products
- Gypsum Association, GA-216, Application and Finishing of Gypsum Panel Products
- Gypsum Association, GA-238, Guidelines for Prevention of Mold Growth on Gypsum Board
- Gold Bond Building Partners, LLC Manufacturer Standards, NGC Construction Guide

TECHNICAL DATA

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

Table 3: Technical Details

| Parameter | Description |
|----------------------|---------------------------------------------------------------|
| Performance | Fire-resistant gypsum core, heavy, 100% recycled paper facers |
| Edge | Squared or Tapered |
| Thickness | 5/8 Inch |
| Width | 48", 54" |
| Color | White and gray |
| ASTM Standard | ASTM C1396 |

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 paper 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 edge tape is added before the products are distributed.

MATERIAL COMPOSITION

Unique product compositions were provided for each product and manufacturing site. The product composition at the Shippingport, PA site is shown in

Table 4 below. The raw materials for the product were obtained from various suppliers across North America, in addition to the paper plants and 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

| Material | Composition [%, range] |
|--------------------------------------------------------------|---------------------------|
| Gypsum, including internally processed reclaim gypsum | 90 - 100% |
| Recycled Paper (100% recycled content) | 0 - 10% |
| Other Materials | 0 - 10% |

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) | 1.1 |
| Biogenic carbon content of product (released at End-of-Life, C4) | 1.0 |

LIFE CYCLE ASSESSMENT BACKGROUND INFORMATION

DECLARED UNIT

The declared unit is 92.9 m² (1,000 square feet) of gypsum board. Gold Bond® Fire-Shield® Gypsum Board consists of a fire-resistant gypsum core encased in heavy, natural-finish, 100% recycled paper on the face and back sides. Applications include walls and ceilings in fire-rated construction where the framing members are spaced up to 24" o.c.

Table 6: Declared Unit

| | Gold Bond® Fire-Shield® Gypsum Board |
|-----------------------------|--------------------------------------|
| Mass per declared unit [lb] | 2283 |

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.

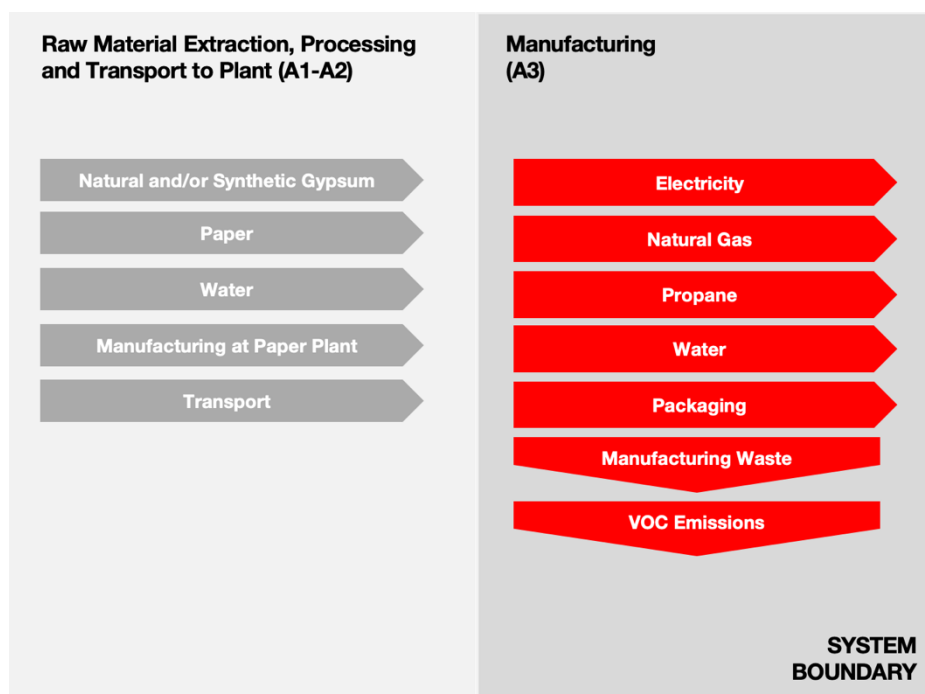


Figure 1: System Boundary

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 the manufacturing facility was adopted. This allocation methodology was used for the following inputs:

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

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 (1,000 square feet) 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 incl biogenic carbon | Global warming potential (100 years, includes biogenic CO ₂) | kg CO ₂ eq |
| GWP excl biogenic carbon | Global warming potential (100 years, excludes 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 |

Table 9: 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 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 |

| 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.

GOLD BOND® FIRE-SHIELD® GYPSUM BOARD (5/8")

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] | 0.258 | 0.054 | 0.0697 | 0.134 |
| EP [kg N eq] | 0.0378 | 0.0104 | 0.00483 | 0.0225 |
| GWP, incl biogenic carbon [kg CO ₂ eq] | 292 | 30.4 | 11.3 | 250 |
| GWP, excl biogenic carbon [kg CO ₂ eq] | 293 | 30.9 | 11.3 | 250 |
| ODP [kg CFC 11 eq] | 4.69x10⁻⁷ | 4.69x10 ⁻⁷ | 3.32x10 ⁻¹⁴ | 8.44x10 ⁻¹³ |
| ADP-fossil fuel [MJ] | 4040 | 415 | 148.0 | 3470 |
| SFP [kg O ₃ eq] | 5.350 | 0.910 | 1.4800 | 2.960 |
| Carbon Emissions and Uptake | | | | |
| BCRP [kg CO ₂] | 1.0 | 1.0 | - | - |
| BCEP [kg CO ₂] | - | - | - | - |
| BCRK [kg CO ₂] | 1.1 | - | - | 1.1 |
| 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] | 143 | 47.4 | 6.20 | 89 |
| RPR _M [MJ] | - | - | - | - |
| RPR _T [MJ] | 143 | 47.4 | 6.20 | 89 |
| NRPR _E [MJ] | 4310 | 439.0 | 150.0 | 3730 |
| NRPR _M [MJ] | - | - | - | - |
| NRPR _T [MJ] | 4320 | 439.0 | 150.0 | 3730 |
| SM [kg] | 52.7 | 52.7 | - | - |
| RSF [MJ] | - | - | - | - |
| NRSF [MJ] | - | - | - | - |
| RE [MJ] | - | - | - | - |
| FW [m ³] | 0.336 | 0.123 | 0.0204 | 0.193 |
| Output Flows and Waste Categories | | | | |
| HWD [kg] | 7.75x10⁻⁷ | 9.96x10 ⁻⁸ | 2.02x10 ⁻⁸ | 6.56x10 ⁻⁷ |
| NHWD [kg] | 9.5 | 2.30 | 0.01440 | 7.1 |
| HLRW [kg] | 1.21x10⁻⁴ | 1.28x10 ⁻⁵ | 5.32x10 ⁻⁷ | 1.08x10 ⁻⁴ |
| ILLRW [kg] | 0.0995 | 0.0089 | 0.000448 | 0.0902 |
| CRU [kg] | - | - | - | - |
| MR [kg] | 29.7 | - | - | 29.7 |
| MER [kg] | - | - | - | - |

| Impact Category | Total A1-A3 | A1 | A2 | A3 |
|-----------------|--------------|----|----|-------|
| EEE [MJ] | 0.75 | - | - | 0.75 |
| EET [MJ] | 0.355 | - | - | 0.355 |

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.

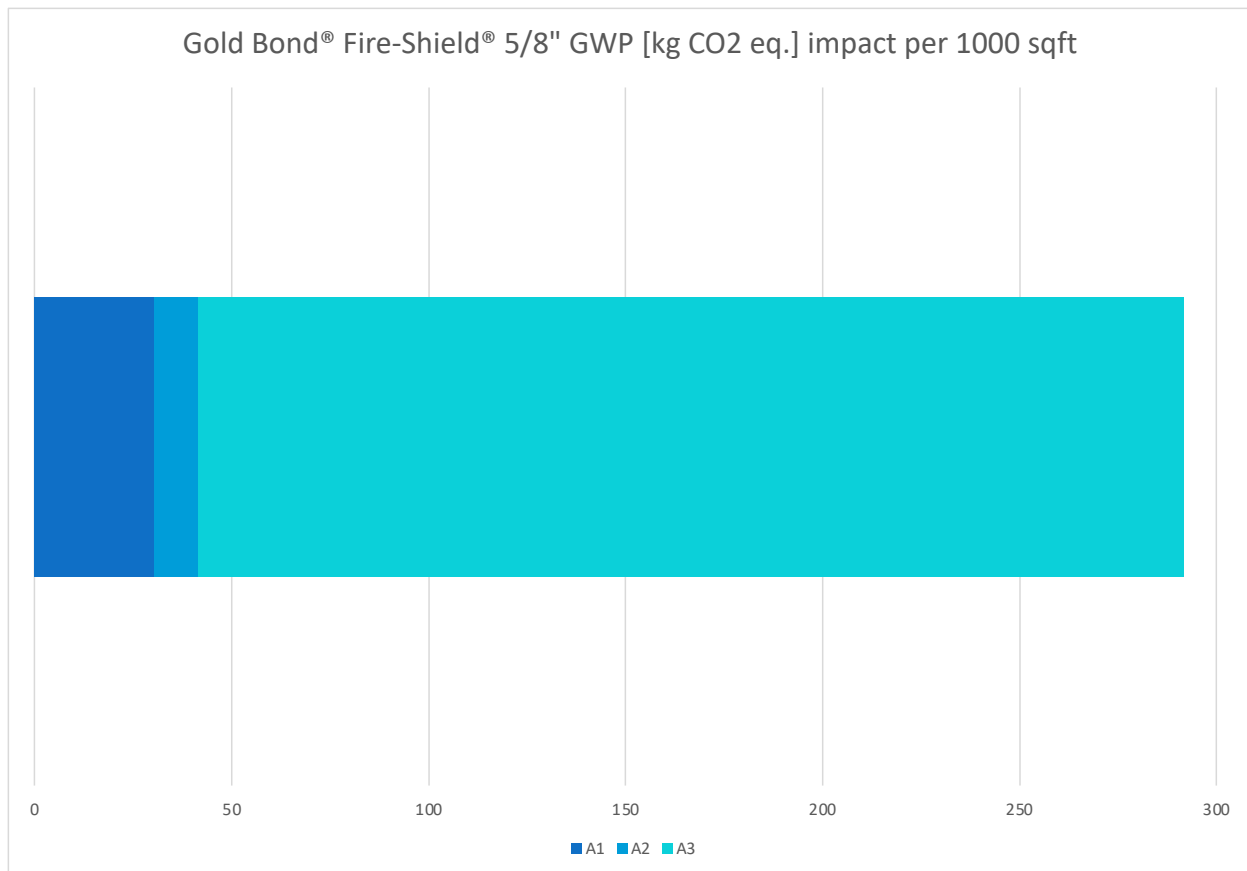


Figure 2: GWP dominance analysis for Gold Bond® Fire-Shield® Gypsum Board (5/8"), Shippingport, PA plant

The dominance analysis shows that the impacts from manufacturing (A3) represent the large majority of the GWP at 86%. Raw material extraction (A1) and transportation (A2) are much lower at 10% and 4%, respectively. The emissions sources contributing the most within the manufacturing stage (A3) are natural gas and electricity usage.

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® Fire-Shield® Gypsum Board is UL GREENGUARD Gold certified and has a published [Health Product Declaration](#).

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

REFERENCES

1. Life Cycle Assessment, LCA Report for National Gypsum Company – Gypsum Boards. WAP Sustainability Consulting. August 2024.
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.