

ENVIRONMENTAL PRODUCT DECLARATION

USG FIBEROCK® BRAND AR INTERIOR PANELS



USG Fiberock® Brand AR Interior Panels are engineered to provide increased resistance to moisture, mold, abrasion, indentation and penetration for interior walls and ceilings in demanding construction applications. These gypsum-fiber panels are designed to outperform paper-faced gypsum board. Strong, solid and durable, they are approved for use in wet areas, including residential showers and tub surrounds. They also resist denting, breaking and puncturing—even in high-traffic areas. They have exceptional surface-burning characteristics (ASTM E84, Flame Spread 5, Smoke Developed 0) and fire resistance (ASTM E119).

TRACI v2.1 ENVIRONMENTAL IMPACTS (CRADLE-TO-GATE)

Declared Unit – 1,000 square feet

	1/2" Fiberock® Brand AR Interior Panels	5/8" Fiberock® Brand AR Interior Panels
Global Warming Potential (kg CO ₂ eq.)	3.31E+02	4.12E+02
Ozone Depletion Potential (kg CFC-11 eq.)	5.50E-10	6.88E-10
Acidification Potential (kg SO ₂ eq.)	9.34E-01	1.07E+00
Eutrophication Potential (kg N eq.)	3.32E-02	4.13E-02
Photochemical Ozone Creation Potential (kg O ₃ eq.)	1.06E+01	1.32E+01
Abiotic Resource Depletion Potential Fossil Fuels (MJ, LHV)	6.97E+02	8.71E+02

For over a century, sustainable practices have naturally been an inherent part of our business at USG. Today, they help shape the innovative products that become the homes where we live, the buildings where we work and the arenas where we play. From the product formulations we choose, to the processes we employ, USG is committed to designing, manufacturing, and distributing products that minimize overall environmental impacts and contribute toward a healthier living space. We believe that transparency of product information is essential for our stakeholders and EPDs are the next step toward an even more transparent USG. For additional information, visit usg.com, cgcinc.com and usgdesignstudio.com

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This declaration is an environmental product declaration (EPD) in accordance with ISO 14025 and ISO 21930: 2017. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. Accuracy of Results: EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.

DECLARATION NUMBER	EPD 130	
PROGRAM OPERATOR	ASTM International – 100 Barr Harbor Drive, West Conshohocken, PA USA www.astm.org	
DECLARATION HOLDER	USG Corporation - 550 W. Adams St., Chicago, IL USA	
DECLARED PRODUCT	USG Fiberock® Brand AR Interior Panels	
REFERENCE PCR	Product Category Rule for Environmental Product Declarations: PCR for Gypsum Panel Products, NSF International, Per ISO 14025 and 21930:2017, Valid through July 17, 2014 For details contact NSF International.	
DATE OF ISSUE	4/8/20	
PERIOD OF VALIDITY	4/8/25	
CONTENTS OF THE DECLARATION	<p>This EPD is complete and contains the following:</p> <ul style="list-style-type: none"> • Product System Documentation • Life cycle Calculation Rules • Life Cycle Assessment Results • Further Information • References 	
This declaration was independently verified in accordance with ISO 14025 and ISO 21930:2017 <input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL	Tim Brooke, ASTM International	
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas P. Gloria, Industrial Ecology Consultants	

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1. Product System Documentation

1.1 Product Description and Product Identification

USG Fiberock® Brand AR Interior Panels are engineered to provide increased resistance to moisture, mold, abrasion, indentation and penetration for interior walls and ceilings in demanding construction applications. These gypsum-fiber panels are designed to outperform paper-faced gypsum board. Strong, solid and durable, they are approved for use in wet areas, including residential showers and tub surrounds. They also resist denting, breaking and puncturing—even in high-traffic areas. USG Fiberock® Brand AR Interior Panels are code approved for use in noncombustible construction. They have exceptional surface-burning characteristics (ASTM E84, Flame Spread 5, Smoke Developed 0) and fire resistance (ASTM E119). USG Fiberock® Brand AR Interior Panels may be used in lieu of Type X gypsum panels in over 50 fire-rated wall assemblies as listed in the Underwriters Laboratories Inc. (UL) Fire Resistance Directory under “Type FRX-G.”

1.2 Application

USG Fiberock® Brand AR Interior Panels are intended for interior wall and ceiling in demanding construction applications. See usg.com for detailed application instructions.

1.3 Product Technical Data

Table 1: Technical Specifications

NAME	UNIT OF MEASURE	ASTM TEST METHOD	1/2" FIBEROCK® BRAND INTERIOR PANELS	5/8" FIBEROCK® BRAND INTERIOR PANELS
Flexural Strength	Lbf	C473	> 110	> 155
Compressive Strength	Psi	n/a	> 500	> 500
Nail-Pull Resistance	Lbs. (0.4" head diameter, wet or dry)	C473	> 120	> 145
Weight	psf	C473	2.4	3.1
Mold Resistance	-	D3273	10 (no growth)	10 (no growth)
Surface Burning Characteristics	Flame/smoke	E84	5/0	5/0
Thermal	"R"/k value	C518	0.30/1.84	--

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1.4 Product Composition

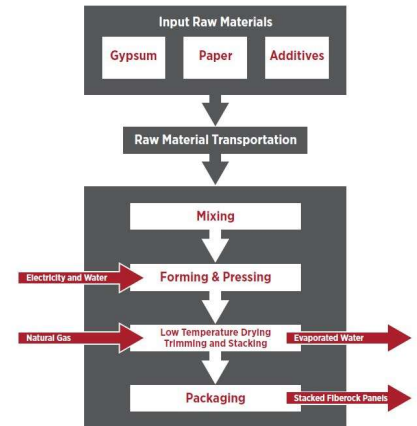
Table 2: Material Composition

MATERIAL	1/2" FIBEROCK® BRAND AR INTERIOR PANELS	5/8" FIBEROCK® BRAND AR INTERIOR PANELS
Gypsum	93%	93%
Paper Fiber	7%	7%
Additives	< 1%	< 1%
Coatings	< 1%	< 1%
Sum	100%	100%

1.5 Product Manufacture

The manufacture of Fiberock® Brand AR Interior Panels starts with the feeding of dry ingredients into a large mixer where these dry ingredients are mixed with water and wet additives. The slurry is transferred to a forming machine. The hydrating material is pressed to achieve the required caliper and then conveyed to a dryer where excess water is evaporated from the panel under mild drying conditions so as not to calcine the gypsum. After removal of excess water, the board is cut to its final size, packaging applied, and the resulting product is ready for shipment.

All Fiberock® Brand AR Interior Panels not meeting quality control specifications are recycled on-site. Packaging consisted of cardboard edge protectors, pallet bags and wooden pallets.



1.6 Environment and Health During Manufacturing

USG has led the building sector's effort in developing and supplying sustainable construction materials. Today, sustainability is integrated into the design and manufacture of every wall, ceiling, and flooring product. As both a producer and a buyer of raw materials, we have a responsibility to extensively review and select each material we use. Each decision we make is based on careful consideration of environmental and safety effects over time. Raw materials used in our products are carefully selected and go through a screening procedure. Incoming raw materials are tested for contaminants by an internal lab and third-party labs for consideration of use and worker, environmental, and end-user exposure. This due diligence helps to ensure our products are safe to handle in our manufacturing plants and on job sites while having minimal impact on occupant health and indoor and outdoor environments.

1.7 Packaging

Packaging consists of cardboard edge protectors, pallet bags and wooden pallets. The production of these packaging materials was modeled in this study. The products under consideration are typically sold in the retail market as single panels or can be delivered in bundles of 24 for the 1/2" product and 30 pieces for the 5/8" product surrounded by cardboard edge protectors, a pallet surround on a wooden pallet.

1.8 Reference Service Life

The Reference Service Life is considered not to be relevant for this cradle-to-gate study.

1.9 Extraordinary Effects

None

2. LCA Calculation Rules 2.1 Declared Unit

The declared unit for Fiberock® Brand AR Interior Panels is defined as 1,000 square feet.

Table 3: Functional Unit

NAME	1/2" FIBEROCK® BRAND AR INTERIOR PANELS (METRIC)	1/2" FIBEROCK® BRAND AR INTERIOR PANELS (STANDARD)	5/8" FIBEROCK® BRAND AR INTERIOR PANELS (METRIC)	5/8" FIBEROCK® BRAND AR INTERIOR PANELS (STANDARD)
Functional Unit	92.9 m²	1,000 sf	92.9 m²	1,000 sf
Declared Thickness	1.27 cm	0.500 in	1.59 cm	0.625 in
Density	958 kg/m³	59.8 pcf	963 kg/m³	60.1 pcf
Surface weight per declared unit	12.2 kg/m²	2,492 lbs./MSF	15.3 kg/m²	3,128 lbs./MSF

2.2 System Boundary

This EPD represents a "cradle-to-gate" LCA analysis for Fiberock® Brand AR Interior Panels. It covers all production steps from raw material extraction (i.e., the cradle) to packaged panels ready for shipment (gate).

2.3 Estimates and Assumptions

All raw material and energy data are specific to the manufacture of Fiberock® Brand panels produced at USG's Gypsum, OH plant. Data collection of energy and raw material inputs were aided by the presence of an extensive computer monitoring system which tracked product formulas and energy usages. The data is limited in that the primary data was collected during the 2018 year and changes in operations may increase/decrease impacts in the future. No changes in raw materials, product formulas or process changes are known at this time that would alter the results of this study. Other data limitations include the use of secondary data sets instead of primary data for upstream and downstream processes, local impacts vs. global impacts, possible impacts vs. actual impacts, inherent uncertainty in the data sets, accuracy and precision of impact assessment methodology, etc.

2.4 Cut-off Criteria

All inputs and outputs to a (unit) process were included in the calculation for which data is available.

In case of insufficient input data or data gaps for a unit process, the cut-off criteria was 1% of renewable and non-renewable primary energy usage and 1% of the total mass of that unit process. The total neglected input flows did not exceed 5% of energy usage and mass.

As such, some minor additives fell well below the cut-off criteria and were therefore not included in this study.

2.5 Background Data

All background was sourced from critically reviewed GaBi databases.

2.6 Data Quality

The LCA model was created using the GaBi software. Specific comments related to data quality requirements cited in ISO 14025 Section 4.2.3.6.2 include the following.

Temporal: In the case of Fiberock® Brand AR Interior Panels production, the LCI data was collected from the Gypsum, OH plant for the 2018 calendar year.

Geographical: Where possible, all processes were chosen as being representative of US manufacturing processes.

Technical: The data selected for this study is specific to the technology used in the preparation of the various raw materials.

Precision: The raw material usage amounts were derived from plant quality data on finished products, coatings usage plant data and product formulas.

Completeness: Virtually all the significant raw material flows (> 99%) used for panel production has been modeled. The exception consists of transportation of the coating raw materials; the effect of which was determined to be less than 1% of the total.

Representative: Where possible all the data sets were selected to be representative of US-based production, are less than 10 years in age and are representative of the technology being employed.

Consistency: All the manufacturing processes were modeled in a consistent manner throughout this study in accordance with the goal and scope definitions.

Reproducibility: The information contained in this study, including raw material, energy and transportation distance inputs, have been fully documented in the LCA report.

Sources of Data: The sources for the processes used in this study have been fully provided in the LCA report and are representative of the material and energy sources used in actual production.

Uncertainty: The relative uncertainty associated with this study has been minimized. No significant assumptions have been made.

2.7 Period under Review

All raw material and energy inputs are for the 2018 calendar year.

2.8 Allocation

Energy inputs were allocated on a mass basis so that 100% of the purchased gas and electricity was allocated to specific types of products based on the mass of those products. Raw material inputs were allocated to specific products based on established product formulas.

2.9 Comparability

A comparison or evaluation of EPD data is only possible if all data sets to be compared are 1) created according to EN 15804 and 2) are considered in a whole building context or utilize identical defined use stage scenarios. Comparisons are only allowable when EPDs report cradle-to-grave information using a functional unit. Refer to section 5.3 of EN 15804 for further information. Comparison of the environmental performance of panels 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 the PCR for Gypsum Panel Products allows EPD comparability only when all stages of a panel life cycle have been considered. However, variations and deviations are possible.

3. Life Cycle Assessment Results

Table 4: Description of the system boundary modules

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	manufacturing	Transport from gate to site	Assembly/Install	Use Stage	maintenance	Repair	Replacement	Refurbishment ¹⁾	Operational Energy Use	Operational Water Use	Deconstruction	Transport	Waste Processing	Disposal	Reuse, Recovery, Recycling Potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	na	na	na	na	na	na	na	na	na	na	na	na	na	MND

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Table 5: Acronym Key

ABBREVIATION	PARAMETER	UNIT
Life Cycle Impact Assessment Indicators		
GWP	Global Warming Potential	kg CO ₂ eq.
ODP	Ozone Depletion Potential	kg CFC-11 eq.
AP	Acidification Potential	kg SO ₂ eq.
EP	Eutrophication Potential	kg N eq.
POCP	Photochemical ozone creation potential	kg O ₃ eq.
ADP	Abiotic resource depletion potential – fossil fuels	MJ, LHV
Resource Use Parameters		
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value (LHV)
PERM	Use of renewable primary energy resources used as raw materials	MJ, net calorific value
PERT	Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value
PENRM	Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value
PENRT	Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	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
FW	Net use of fresh water	m ³
Waste Parameters		
HWD	Disposed-of-hazardous waste	kg
NHWD	Disposed-of non-hazardous waste	kg
RWD	Radioactive Waste Disposed	kg
Output Flow Parameters		
CRU	Components for reuse	kg
MFR	Materials for recycling	kg
MER	Materials for energy recovery	kg
EE	Exported energy	MJ

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3.1 Life Cycle Impact Assessment Results

Results are presented for 1000 square feet of Fiberock® Brand AR Interior Panels.

Table 6: LCA Results for 1 MSF of 1/2" Fiberock® Brand AR Interior Panels

TRACI v2.1	UNITS	A1	A2	A3
GWP 100	kg CO ₂ eq.	5.51E+00	3.30E+01	2.92E+02
ODP	kg CFC-11 eq.	5.91E-10	-1.78E-13	-4.01E-11
AP	kg SO ₂ eq.	5.16E-01	1.08E-01	3.10E-01
EP	kg N eq.	2.38E-03	9.85E-03	2.10E-02
POCP	kg O ₃ eq.	2.98E-01	2.60E+00	7.69E+00
ADP	MJ, LHV	2.05E+01	6.25E+01	6.14E+02

Table 7: LCA Results for 1 MSF of 5/8" Fiberock® Brand AR Interior Panels

TRACI v2.1	UNITS	A1	A2	A3
GWP 100	kg CO ₂ eq.	6.24E+00	4.14E+01	3.64E+02
ODP	kg CFC-11 eq.	7.39E-10	-2.23E-13	-5.02E-11
AP	kg SO ₂ eq.	5.45E-01	1.35E-01	3.85E-01
EP	kg N eq.	2.96E-03	1.24E-02	2.60E-02
POCP	kg O ₃ eq.	3.56E-01	3.26E+00	9.59E+00
ADP	MJ, LHV	2.37E+01	7.84E+01	7.69E+02

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3.2 Life Cycle Inventory Results

Table 8: Resource Use for 1 MSF of Fiberock® Brand AR Interior Panels

PARAMETER	UNITS	1/2" FIBEROCK® BRAND AR INTERIOR PANELS	5/8" FIBEROCK® BRAND AR INTERIOR PANELS
PERE	MJ, LHV	9.49E+01	1.18E+02
PERM	MJ, LHV	0.00E+00	0.00E+00
PERT	MJ, LHV	9.49E+01	1.18E+02
PENRE	MJ, LHV	5.50E+03	6.84E+03
PENRM	MJ, LHV	0.00E+00	0.00E+00
PENRT	MJ, LHV	5.50E+03	6.84E+03
SM	MJ, LHV	1.13E+03	1.41E+03
RSF	MJ, LHV	0.00E+00	0.00E+00
NRSF	MJ, LHV	0.00E+00	0.00E+00
FW	m³	6.27E+00	7.86E+00

Table 9: Output Flows and Waste Categories for 1 MSF of Fiberock® Brand AR Interior Panels

PARAMETER	UNITS	1/2" FIBEROCK® BRAND AR INTERIOR PANELS	5/8" FIBEROCK® BRAND AR INTERIOR PANELS
HWD	kg	6.13E-06	7.70E-06
NHWD	kg	1.87E+00	2.34E+00
RWD	kg	0.00E+00	0.00E+00
CRU	kg	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00
EE	MJ, LHV	0.00E+00	0.00E+00

3.3 LCA Interpretation

The LCA results for the production of 1 MSF of Fiberock® Brand AR Interior Panels were dominated by energy usage; primarily gas and electricity usage during the drying process.

4. Further Information

None

5. References

LCA Report

A Cradle-to-Gate (A1-A3) Life Cycle Assessment of USG Fiberock® and Securock® Panels, December 2, 2019. USG.

PCR

NSF, "Product Category Rules for Gypsum Panel Products", Valid to July 17, 2024

SUSTAINABILITY REPORTING STANDARDS

EN 15804: 2012-04 - Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction product.

ISO 14025: 2006 - Environmental labels and declarations — Type III environmental declarations — Principles and procedures

ISO 14040: 2006 - Environmental management – Life cycle assessment – Principles and framework

ISO 14044:2006 - Environmental management – Life cycle assessment – Requirements and guidelines

ISO 14046:2013 - Environmental management- Water footprint- Principles, requirements and guidelines

ISO 15392:2008 - Sustainability in building construction- General principles

ISO 15686-1:2011 - Buildings and constructed assets- Service life planning- Part 1: General principles

ISO 15686-2:2008 - Buildings and constructed assets- Service life planning Part 2: Service life prediction procedures

ISO 15686-7:2008 - Buildings and constructed assets- Service life planning Part 7: Performance evaluation for feedback of service life data from practice

ISO 15686-8:2008 - Buildings and constructed assets- Service life planning Part 8: Reference service life and service life estimation

ISO 21930: 2007 - Sustainability in building construction -- Environmental declaration of building products