

USG Micore® SB Mineral Fiber Board is designed to be used in stove board applications and is a recognized component for use in type I and II floor protectors and wall shields classified in accordance with UL1618.



CRADLE-TO-GATE (A1-A3) FUNCTIONAL UNIT – 1 SF	1/2" MICORE® SB MINERAL FIBER BOARD
Global Warming Potential (kg CO₂ eq.)	1.94E-01
Ozone Depletion Potential (kg CFC 11 eq.)	8.94E-13
Acidification Potential (kg SO₂ eq.)	6.38E-04
Eutrophication Potential (kg N eq.)	1.65E-04
Photochemical Ozone Creation Potential (kg O₃ eq.)	1.10E-02
Abiotic Resource Depletion Potential Fossil Fuels (MJ, LHV)	4.94E-01

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 Environmental Product Declarations (EPDs) are the next step toward an even more transparent USG. For additional information, visit usg.com and usg.ecomedes.com.

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 476	
PROGRAM OPERATOR	ASTM International – 100 Barr Harbor Drive, West Conshohocken, PA USA www.astm.org	
EPD Type	Type III Declaration per ISO 14025:2006	
DECLARATION HOLDER	United States Gypsum Company - 550 W. Adams St., Chicago, IL USA	
DECLARED PRODUCT	USG 1/2" Micore® SB Mineral Fiber Board	
REFERENCE PCR	UL Environment: PCR Guidance for Building-Related Products and Services; Part B: Non-Metal Ceiling Panel and Interior Wall EPD Requirements; April 13, 2021	
DATE OF ISSUE PERIOD OF VALIDITY	6/15/23 5 Years	
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 • Life cycle Assessment Interpretation • References 	
<p>This declaration was independently verified in accordance with ISO 14025 and ISO 21930:2017</p> <p><input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL</p>	Tim Brooke, ASTM International	
<p>This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:</p>	Thomas P. Gloria, Industrial Ecology Consultants	

1. Product System Documentation

1.1 Product Description and Product Identification

Micore® SB Mineral Fiber Board is a recognized component for use in type I and II floor protectors and wall shields classified in accordance to UL1618.

1.2 Designated Application

Micore® SB Mineral Fiber Board is a recognized component for use in type I and II floor protectors and wall shields classified in accordance to UL1618.

1.3 Product Technical Data

Name	1/2" Micore® SB
Surface burning characteristics of building materials Test Method ASTM E84	Class A
Density	nominal 23 pcf
Modulus of Rupture	200 psi
Hardness (Janka Ball)	30 lbs.
Hygrometric Expansion (50% to 70% R.H.)	0.10%
Thermal Conductivity	k Factor = 0.43 R Value = 1.17

Table 1: Summary of the technical data

1.4 Placing on the Market/Application Rules

Micore® SB Mineral Fiber Board is sold to manufacturers and is designed to be used in OEM applications, such as building stove construction.

1.5 Delivery Status

Micore® SB Mineral Fiber Board arrives at the customer packaged in stacks using broke material placed on the sides, top and bottom and then banded with 2 plastic bands.

1.6 Product Composition

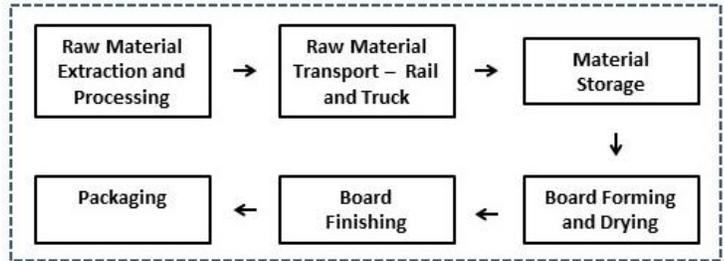
Material	Micore® SB Mineral Fiber Board
Mineral Fiber Basemat	95.2%
Coatings	4.8%
Total	100.0%

Table 2: Product formula

1.7 Product Manufacture

Micore® SB Mineral Fiber Board contains perlite, mineral wool, paper fiber and starch. In smaller amounts, other raw materials used in the panel forming process include flocculants, biocides and defoamer. The finishing and packaging unit processes are dominated by the use of water-based paint, which contains ingredients such as calcium carbonate, clay, latex, and other chemicals.

In wet-felted production, the panel ingredients are mixed into a dilute slurry, which is then formed onto a wire as a basemat. The basemat is dewatered, pressed and dried. The dried panels are cut or trimmed into the appropriate sizes and painted. Painting may involve two or more coatings with a drying cycle between coatings. After inspection, the panels are packaged for shipment. Panel trim and panels that are chipped or broken during manufacturing (referred to as “broke”) are recycled and returned to the process.



1.8 Packaging

Micore® SB Mineral Fiber Board is packaged in stacks using broke material placed on the sides, top and bottom and then banded with 2 plastic bands.

1.9 Environment and Health During Manufacturing

USG and CGC have 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.

1.10 Conditions of Use

To insure the longevity of the product, panels should not be exposed to moisture, high humidity, or high temperature. Criteria can be found in the USG warranty information specific to each product.

1.11 End-of-Life Disposal

USG is helping to meet the needs of a growing world and preserve natural resources by taking back approved ceiling panels from any manufacturer and recycling them into new building products. While USG encourages recycling of its ceiling panels through its take back program, all waste generated during installation and at end-of-life is assumed to be disposed of in an appropriate landfill.

Estimated biogenic carbon emissions at EoL are presented below.

Estimated Biogenic Carbon Emissions for 1 Square Foot of Micore® SB Mineral Fiber Board at EoL		
Environmental Impact Category	Units	Micore® SB Mineral Fiber Board
Global Warming Potential	kg CO2 eq.	2.29E-02

1.12 Reference Service Life

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

1.13 Extraordinary Effects

Fire

Micore® SB Mineral Fiber Board is certified to be Class A (flame spread of 25 or less, smoke developed of 50 or less per ASTM C84).

2. LCA Calculation Rules

2.1 Declared Unit

The declared unit for this product is defined as one square foot (0.093 square meters) of product.

NAME	MICORE® SB™ (METRIC)	MICORE® SB™ (STANDARD)
Declared Unit	0.093 m²	1 ft²
Declared Thickness	1.27 cm	0.500 in
Density	368 kg/m³	23.0 pcf
Surface weight per declared unit	4.68 kg/m²	0.958 lb./ft²

Table 3

2.2 System Boundary

This EPD represents a “cradle-to-gate” LCA analysis for Micore® SB mineral fiber panels.

Product stage				Construction process stage				Use stage				End of life stage			
Raw Material Supply	Transport	Manufacturing	Transport	Construction- Installation Process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational water Use	De-construction	Transport	Waste processing	Disposal
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

It covers all the production steps from raw material extraction (i.e., the cradle) to packaged stacks of product.

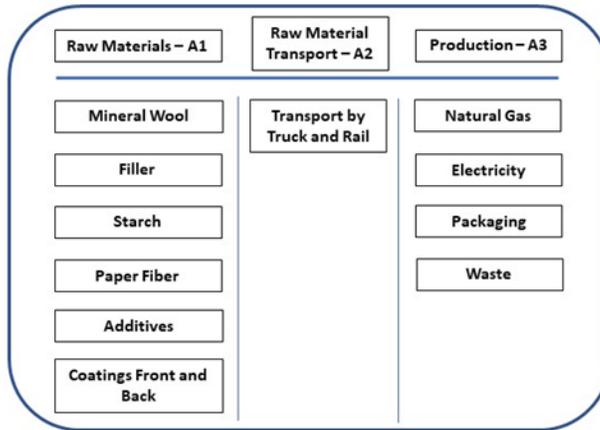


Figure 1: Specific processes covered by this EPD by life cycle stage

2.3 Estimates and Assumptions

In the case of the USG Micore® SB Mineral Fiber Board at the Cloquet, MN plant, data collection of energy and raw material inputs were aided by the presence of an extensive computer monitoring system which tracked product formulas by product type. All wet-formed mineral fiber product raw material and energy inputs are specific to the specific wet-formed mineral fiber product produced at the Cloquet, MN plant.

Additional data limitations include the use of proxy processes rather than actual supplier generated primary data. This would include such processes as starch, which is representative of wet-milled corn starch but may not necessarily be representative of USG's particular starch supplier. In addition, the data is limited in that the primary data was collected during the 2021 year and changes in operations may increase/decrease impacts in the future. 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.

2.5 Background Data

All background was sourced from critically reviewed Sphera LCA for Experts databases.

2.6 Data Requirements and Data Sources

The LCA model was created using LCA for Experts 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 production, the LCI data was collected for the 2021 production 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 and on plant product formulas.

Completeness: Virtually all the significant raw material flows (> 99.9%) have been modeled.

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 2021 calendar year.

2.8 Allocation

The LCI data was collected from the Cloquet production plant for the 2021 production year. Raw material inputs are specific to these panels and energy inputs were allocated based on the mass of these panels.

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 this product 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 North American Ceiling and Interior Wall Panels 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

Environmental LCA Results for 1 SF of Cloquet 1/2" Micore® SB Panels (A1-A3)					
Impact Assessment Method: TRACI 2.1		A1	A2	A3	Total A1-A3
Environmental Impact Category	Units	Impact	Impact	Impact	Impact
Global warming	kg CO2 eq.	5.62E-02	1.78E-02	1.20E-01	1.94E-01
Ozone Depletion Potential (ODP)	kg CFC 11 eq.	8.85E-13	4.65E-17	9.38E-15	8.94E-13
Acidification Potential	kg SO2 eq.	4.82E-04	1.13E-04	4.33E-05	6.38E-04
Eutrophication Potential (EP)	kg N eq.	1.53E-04	9.24E-06	2.85E-06	1.65E-04
Photochemical Ozone Creation Potential (POCP)	kg O3 eq.	6.03E-03	3.64E-03	1.33E-03	1.10E-02
Abiotic Depletion Potential (ADP) - fossil fuels	MJ surplus energy	1.83E-01	3.35E-02	2.78E-01	4.94E-01

Resource and Waste Flows for 1 SF of Cloquet 1/2" Micore SB Panels (A1-A3)					
Use of Primary Resources		A1	A2	A3	Total A1-A3
Renewable primary resources used as an energy carrier (RPR-E)	MJ, NCV	7.49E-01	1.01E-02	5.73E-01	1.33E+00
Renewable primary resources with energy content used as material (RPR-M)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable primary resources used as an energy carrier (RPR-E)	MJ, NCV	2.74E+00	2.53E-01	1.87E+00	4.87E+00
Non-renewable primary resources with energy content used as material (RPR-M)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Secondary material, secondary fuel and recovered energy		A1	A2	A3	Total A1-A3
Secondary Material (SM)	kg	2.29E-01	0.00E+00	0.00E+00	2.29E-01
Renewable Secondary Fuel (RSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable Secondary Fuel (NRSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable Energy (RE)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Consumption of Fresh Water	m3	4.94E-03	3.46E-05	1.95E-05	5.00E-03

Additional inventory parameters for transparency		A1	A2	A3	Total A1-A3
Removals and emissions associated with biogenic carbon content of the bio-based product	kg CO2-eq.	-9.47E-02	0.00E+00	0.00E+00	-9.47E-02
Emission from calcination and uptake from carbonation	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Removals and emissions associated with biogenic carbon content of the bio-based packaging	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Emissions from land use change	kg CO2-eq.	1.02E-04	2.05E-05	3.21E-06	1.26E-04
Emissions from combustion of waste from renewable sources used in production processes	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Emissions from combustion of waste from non-renewable sources used in production processes	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00

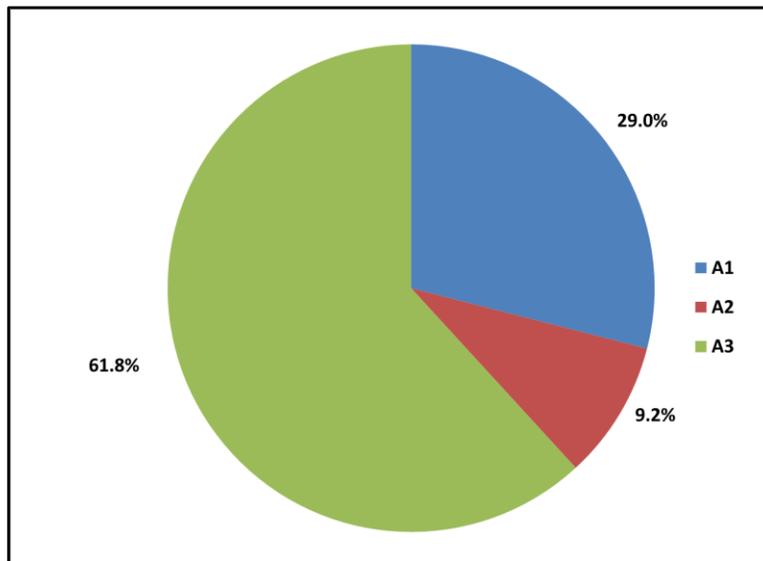
Indicators describing waste		A1	A2	A3	Total A1-A3
Hazardous waste disposed	kg	1.79E-11	7.29E-13	-2.35E-10	-2.16E-10
Non-hazardous waste disposed	kg	5.22E-02	2.21E-05	5.75E-04	5.28E-02
High-level radioactive waste	kg	3.36E-05	7.27E-07	4.92E-07	3.48E-05
Intermediate and low-level waste	kg	NA	NA	NA	NA

Assignments of output flows at the end-of-life		A1	A2	A3	Total A1-A3
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (MR)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Recovered energy exported (EE)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00

4. LCA Interpretation

The LCA results for the production of USG Micore® SB Mineral Fiber Board were dominated by energy usage; primarily gas usage during the drying process. Drying energy was the key input influencing the LCA measures.

Figure 3: Process Dominance Analysis for GWP for the Production of 1 Square Foot of Micore® SB Mineral Fiber Board



5. References

LCA Report

A Cradle-to-Gate and a Cradle-to-Grave Life Cycle Assessment of USG Cloquet Wet-felted Products Products, 6/8/23. USG (Confidential)

Product PCR

UL Environment: Product Category Rules for Building-Related Products and Services Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report, UL 10010, v3.2 December, 2018.

UL Environment: Product Category Rules for Building-Related Products and Services Part B: Non-Metal Ceiling and Interior Wall Panel EPD Requirements, UL 10010-26, v2.0, April 2021.

ASTM International General Program instructions, v8.0, April 29, 2020.

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/Amd 1:2020 - Environmental management – Life cycle assessment – Principles and framework

ISO 14044:2006/Amd 1:2020 - 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 21930:2017 - Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services