

Product Information		
Manufacturer Name	USG Corporation	
Product Name	USG Sheetrock® Brand EcoSmart Panels Firecode X 5/8": Western US USG Sheetrock® Brand EcoSmart Panels Firecode X 5/8": Eastern US	
Impact Comparison Parameters		
Type of Comparison	<input type="checkbox"/> Current vs Prev. LCA of Product <input type="checkbox"/> Current vs Prev. EPD of Product	<input type="checkbox"/> Current vs Industry-Wide LCA <input checked="" type="checkbox"/> Current vs Industry-Wide EPD
Current EPD	https://www.usg.com/content/dam/USG_Marketing_Communications/united_states/product_promotional_materials/finished_assets/usg-sheetrock-ecosmart-panels-firecode-x-epd-en-usa-4787352797-105-1-west.pdf https://www.usg.com/content/dam/USG_Marketing_Communications/united_states/product_promotional_materials/finished_assets/usg-sheetrock-ecosmart-panels-firecode-x-epd-en-usa-4787352797-104-1-east.pdf	
Industry-Wide EPD	http://www.gypsum.org/wp-content/uploads/2013/12/Gypsum-2014-FINAL-May-13-.pdf	
Life Cycle Stages	Cradle-to-Shipping Gate (A1-A3)	
Functional Unit	1,000 sq ft (1 MSF) of 5/8" gypsum board	
Impact Assessment (TRACI 2.1)		
	<i>Current Product*</i>	<i>Industry-Wide Product*</i>
GWP [kg CO2eq]	252.4 (Western) 231.5 (Eastern)	297.2
<small>* Note: The values above will not correspond directly with values disclosed in the EPDs listed above. To complete this analysis, the third party verifier conducted a separate analysis based on primary data using the same software platform. This additional analysis was required to assure that comparison was accurate.</small>		
Impact Comparison Results		
Comparison Summary	The USG product has greater than 10% GWP impact reduction than the product represented in the industry wide EPD.	
LEED Credit Achieved	<input type="checkbox"/> LEED v4.0 @ 100% cost <input type="checkbox"/> LEED v4.1 @ 100% cost or 1 product	<input checked="" type="checkbox"/> LEED v4.1 @ 150% cost or 1.5 products <input type="checkbox"/> LEED v4.1 @ 200% cost or 2 products
Verifier	Matt Van Duinen, WAP Sustainability, May 30, 2019	
Expiration Date	June 1, 2022	

Third Party LEED Verification Statement

It is WAP Sustainability's professional opinion that the product(s) in question meets the following LEED Materials and Resource Credit, Environmental Product Declaration, Option 2 criteria:

<input type="checkbox"/> Product Does Not Meet LEED Option 2 Criteria
<input type="checkbox"/> Impact Reduction in 3+ Categories (value at 100% by cost for LEED v4.0)
<input type="checkbox"/> GWP Reduction >0% (value at 100% by cost or 1 product for LEED v4.1)
<input checked="" type="checkbox"/> GWP Reduction 10+% (value at 150% by cost or 1.5 products for LEED v4.1)
<input type="checkbox"/> GWP Reduction 20+% and Impact Reduction 5+% in 2+ Additional Categories (value at 200% by cost or 2 products for LEED v4.1)

This determination was made for the following reasons:

- The comparability assessment initially reviewed the EPDs and gaps to comparability were initially found. However, the LCA reports were provided and reviewed. This second level of review helped to fill the gaps and provided enough information for us to come to the conclusion that comparability was achieved.
- Additionally, a separate LCA-based analysis was conducted to align the LCA software use and time boundaries the datasets. This analysis still showed reductions but at a more conservative level. This more conservative level of reduction was the basis for determining optimization.
- GWP reductions of at least 10% were shown. Only GWP was considered.
- The narrative provided by USG was found to adequately address the source of the reductions found in the comparison. The narrative is attached as an appendix to this report.
- USG has provided a timeline for publishing this report publicly and given direction as to the location that this report will be published.



Matt Van Duinen

Sustainability Director

WAP Sustainability Consulting, LLC

Product Descriptions

Current EPD

USG Sheetrock® Brand EcoSmart Panels Firecode® X have been formulated to achieve all of the strength and performance characteristics of standard 5/8 in. USG Sheetrock® Brand Firecode® X Panels at a significantly lower environmental impact and reduced weight. They feature an innovative noncombustible gypsum core encased in 100% recycled face and back papers that form a high strength-to-weight ratio composite design. The natural finish face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and even. The long edges of the panels are tapered, allowing joints to be reinforced and concealed with USG Sheetrock® Brand joint treatment systems. The panels are UL classified for fire resistance and can be used in any UL Design where Type ULIX panels are listed. On the face along the long edge of each panel, the UL Type Designation is printed with nonbleeding ink for easy identification after installation.

The manufacture of gypsum board starts with the combining of the dry ingredients in a screw conveyor, feeding of this dry ingredient mixture into a pin mixer where these dry ingredients are mixed with water and wet additives. The resulting slurry is fed between two sheets of paper; facing paper (Manila) on the bottom and backing paper (Newslined) on the top. The wet gypsum board is allowed to hydrate after which the hard board is cut and transferred into a kiln for evaporation of excess water. After removal of the evaporative water, the board is cut to its final size, end tapes are applied and the resulting product is ready for shipment. Any gypsum board not meeting quality control specifications is recycled on-site.

Industry-Wide EPD

Gypsum board is produced primarily for use as an interior surfacing for both residential and commercial building applications. 5/8" type X gypsum board is used in single-layer and double-layer wall systems, and has an assumed service life (ASL) of 60 years. Its greater thickness and special core additives provides additional fire resistance, higher rigidity, and enhanced sound attenuation as compared to regular 1/2" gypsum board. 5/8" (16mm) type X North American gypsum boards are manufactured to ASTM C1396, Standard Specification for Gypsum Board.

Packaging consists of gypsum board end tape (bundling tape) constructed of paper and containing water- and oil-based ink; plastic shrink-wrap, banding, rail bags and slip sheets; cardboard and metal edge/corner protectors; risers/spacers constructed of gypsum board; and adhesive for risers/spacers.

Assessment of Impact Results

Life Cycle Stages

Sourcing and Manufacturing	Transportation and Installation	Use Phase		End of Life	Other
<input checked="" type="checkbox"/> A1	<input type="checkbox"/> A4	<input type="checkbox"/> B1	<input type="checkbox"/> B5	<input type="checkbox"/> C1	<input type="checkbox"/> D
<input checked="" type="checkbox"/> A2	<input type="checkbox"/> A5	<input type="checkbox"/> B2	<input type="checkbox"/> B6	<input type="checkbox"/> C2	
<input checked="" type="checkbox"/> A3		<input type="checkbox"/> B3	<input type="checkbox"/> B7	<input type="checkbox"/> C3	
		<input type="checkbox"/> B4		<input type="checkbox"/> C4	

Functional/Declared Unit

	Reference Flow	Product Reference Service Life	Estimated Building Service Life
Current LCA/EPD	1,000 sq ft of board	N/A	N/A
Baseline LCA/EPD	1,000 sq ft of board	N/A	N/A

Assessment Results

As the original life cycle assessments for the products in question were not performed in a similar manner, the results were not directly comparable. An additional LCA-based analysis was necessary to generate the comparison table below, and as such, the results are now directly comparable.

	USG Western	USG Eastern	Industry-Wide	Impact Change (Western)	Impact Change (Eastern)
GWP [kg CO2eq]	252.42	231.5	297.2	-15.1%	-22.1%

WAP Sustainability’s Criteria for Comparability

Per ISO14025, “Type III environmental declarations are intended to allow a purchaser or user to compare the environmental performance of products on a life cycle basis. Therefore comparability of Type III environmental declarations is critical. The information provided for this comparison shall be transparent in order to allow the purchaser or user to understand the limitations of comparability inherent in the Type III environmental declarations.”

WAP Sustainability takes this requirement very seriously. No EPD is an exact replica of another. Due to the human element and the embodied uncertainty in complex supply chain, there are nearly always limitations to comparability. The goal is to limit those limitations. It is important for the user of an EPD to understand that the environmental impact values presented are ballpark figures based on the best available science, expert decisions and available budgets. At WAP Sustainability, we agree with the above statement taken from ISO14025 and believe that “comparability of Type III environmental declarations is critical”. Without comparability, the power of LCAs and EPDs to help facilitate a transition to an environmentally sustainable economy will always be limited. The key is for the comparison be done in a manner that is critically reviewed and open.

To facilitate transparency, we have presented our entire criteria for the assessment of comparability in the table below.

	Score = 0	Score = 1	Score = 2	Score = 3
	Data is not at all comparable.	Data is significantly not comparable. Modification may need to be made.	Data is comparable but opportunities for improvement exist.	Data is highly comparable.
	A single score of 0 will result in LCA/ EPD not being able to be compared	Multiple scores of 1 will result in LCA/ EPD not being able to be compared		
Count	0	0	12	17

Comparability Findings

- Comparable for the Purposes of LEED Credit Achievement*
- Not Comparable for the Purposes of LEED Credit Achievement*

The products in question are similar in application, size, and use scenarios. The production method in manufacturing is similar. The boundary conditions of the study are the same between the studies. Both studies utilize the same Product Category Rules (PCR). Additionally, further LCA expert analysis was conducted. It is because of these facts that the EPDs are comparable.

Comparability Assessment			
	USG EPD/LCA	Industry-Wide EPD/LCA	Comparability
General			
Program Operator	US Environment	FPIInnovations	2
PCR	Product Category Rules for North American Gypsum Boards FPIInnovations – Gypsum PCR-2013: v1.	Product Category Rules for North American Gypsum Boards FPIInnovations – Gypsum PCR-2013: v1.	3
Period of Validity			
Date Published	May 2016	April 2014	2
Expiration Date	May 2021	April 2019	2
Product Category Definition			
Product Type	5/8” Type X Gypsum Board	5/8” Type X Gypsum Board	3
Manufacturing Description	Dry ingredients fed into a screw conveyor, mixed with water and wet additives, fed between sheets of paper, allowed to fully hydrate, dried in kiln, cut to size and packaged.	Dry ingredients are crushed, partially dehydrated, mixed with additives and water, extruded between two layers of paper, allowed to fully hydrate, cut, dried in a kiln, packaged.	3
Declared or Functional Unit	1,000 sq ft	1,000 sq ft	3
Weight per declared or functional unit	1,800 lbs	2,220 lbs	3
Relevant Technical Properties, as listed in documentation	Meet or exceed ASTM C1396 Section 5 for 5/8” gypsum wallboard, Type X. 0.45 °F x ft ² x h/Btu	Manufactured to ASTM C1396, Standard Specification for Gypsum Board	3
Reference Service Life (Product)	N/A	N/A	3
Estimated Service Life (Building)	N/A	N/A	3
Materials and Substances			
Raw Materials and Percent listed in LCA or EPD	-	-	2
Gypsum - (%)	88.5%	59.6%	-

Comparability Assessment			
	USG EPD/LCA	Industry-Wide EPD/LCA	Comparability
Paper - (%)	6.0%	2.4%	-
Additives - (%)	5.5%	38.0%	-
Recycled Content Percentage	0.6% - 93.1% Pre-Consumer 0% - 12.7% Post-Consumer	1.2% Post-Consumer Varies by manufacturer	2
Goal and Scope			
Stated Goal of LCA or EPD	Create an LCA for gypsum board products to understand impacts and create EPDs	Better characterize environmental performance of products, create EPDs	3
Stated Scope of LCA or EPD	Cradle-to-Shipping Gate	Cradle-to-Shipping Gate	3
Format for Declaration			
LCA or EPD	EPD	EPD	3
ISO 14025 Series Compliance	Yes	Yes	3
ISO 21930 Compliance	Not specified in EPD. LCA/EPD does not specify compliance, but LCA/EPD review shows that they comply with ISO 21930.	Not specified in EPD. LCA specifies compliance with ISO 21930.	2
EN 15804 Compliance	N/A	N/A	-
Data Collection			
Assessed data quality	Data within 10 years, US datasets when possible, appropriate technologies used	Data within 10 years, US datasets when possible, appropriate technologies used	3
Vintage of Primary Data	2015	2010	2
Key Assumptions, overall	Mass allocation at plants	Mass allocation at plants	3
Key Assumptions, Use Phase	N/A	N/A	-
Key Assumptions, EOL	N/A	N/A	-

Comparability Assessment			
	USG EPD/LCA	Industry-Wide EPD/LCA	Comparability
Defined Cut off rule	<1% mass <1% energy <5% total	<1% mass <1% energy <2% env. relevance <3% total	2
Percent of materials left out of study	0.101%	0%	2
Software Used to model LCA	GaBi v7.3.0.40	SimaPro v7.3.0	2
Source of Secondary Datasets	thinkstep	USLCI, ecoinvent v2.2	2
Vintage of Secondary Datasets	Updated 2015	Updated 2011	2
Reporting Categories			
LCIA Impacts Assessment Methodology	TRACI v2.1	TRACI v2.1	3
Description of any modifications made to reporting categories that were necessary to facilitate comparison	None	None	3
Equivalency of Stages			
Description of any modifications made to Life Cycle Stages that were necessary to facilitate comparison	None	None	3

Appendix: Provided narrative describing how reductions in impacts were achieved.

USG Sheetrock® Brand EcoSmart Panels Firecode® X (UL Type ULIX™) represent a revolution in wallboard manufacturing, significantly reducing the Environmental Product Declaration impact category of global warming potential. Developed to answer the demand for more sustainable building products, these 5/8 in. ultralightweight Type X gypsum panels are made possible by modifying the chemical composition of wallboard and employing proprietary manufacturing process technologies. The product requires less water and less energy for the drying process which aids in fewer carbon emissions and may reduce overall project and installation time.

The development of USG Sheetrock® Brand EcoSmart Panels Firecode® X is evidence that manufacturers do not need to compromise quality and durability in order to create sustainable building products. There are always ways to do things better and smarter, and at USG, we remain committed to pushing the boundaries of what's possible.