

# Environmental Product Declaration

## USG Drywall Suspension System – Flat & Curved Ceilings

Stockton, CA, Westlake, OH



### Features and Benefits

- Installs faster than traditional framing methods.
- More than 60 UL fire-resistive designs.
- Assemblies available to meet STC and IIC requirements.
- Easily frames openings for Type F and Type G light fixtures.
- Evaluated for building code compliance according to ICC ESR-4358.
- G90 galvanization available for a variety of environmental conditions including exterior ceiling systems.
- Wind load tested and approved, including Miami-Dade NOA, for exterior applications with proper bracing and framing.



	<b>USG Drywall Suspension System Flat &amp; Curved Ceilings Cradle-to-Grave (A1-C4)</b>
<b>Functional Unit – 1 square foot (0.0929 square meters)</b>	
<b>Global Warming Potential (kg CO<sub>2</sub> eq.)</b>	<b>5.93E-01</b>
<b>Ozone Depletion Potential (kg CFC-11 eq.)</b>	<b>2.87E-10</b>
<b>Acidification Potential (kg SO<sub>2</sub> eq.)</b>	<b>1.53E-03</b>
<b>Eutrophication Potential (kg N eq.)</b>	<b>6.96E-05</b>
<b>Photochemical Ozone Creation Potential (kg O<sub>3</sub> eq.)</b>	<b>1.97E-02</b>
<b>Abiotic Resource Depletion Potential Fossil Fuels (MJ, LHV)</b>	<b>3.30E-01</b>

For over a century, sustainable practices have naturally been an inherent part of our business at USG and CGC. 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 and CGC are 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 and CGC. For additional information, visit [usg.com](http://usg.com), [cgcinc.com](http://cgcinc.com) and [usg.ecomedes.com](http://usg.ecomedes.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.

USG Corporation has sole ownership, liability, and responsibility for this EPD.

Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building or construction works level, and therefore EPDs may not be used for comparability purposes when not considering the whole building life cycle. EPD comparability is only possible 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 in results upstream or downstream of the life cycle stages declared.

DECLARATION NUMBER	EPD 649	
EPD TYPE	Product Specific Plant Averaged EPD	
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	
EPD Type	Type III Declaration per ISO 14025:2006	
DECLARED PRODUCT	USG Drywall Suspension System – Flat & Curved Ceilings	
DATE OF ISSUE	4/1/24	
PERIOD OF VALIDITY	5 Years	
CORE STANDARD	ISO 21930	
CORE PCR	UL Environment: Product Category Rules for Construction Products for Building-Related Product and Services in North America; Part A: Life Cycle Assessment Calculation Rules and Report Requirements. v3.2, December 2018	
SUB-CATEGORY PCR	UL Environment: PCR Guidance for Building-Related Products and Services; Part B: Metal Ceiling Panel EPD Requirements; January 15, 2020	
ACLCA PCR OPEN STANDARD CONFORMANCE	Transparency	
ACLCA PCR OPEN STANDARD VERSION	Version 1.0   May 25, 2022	
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

The USG™ Drywall Suspension System for Flat and Curved Ceilings is roll formed with a hot dipped galvanized body and integrated cap. The system is generally used as a support for the installation of drywall ceilings. It is manufactured by USG in Stockton, CA, and Westlake, OH. It is tested in accordance with ASTM C635 Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings. This EPD covers the USG™ Drywall Suspension System for Flat and Curved Ceilings.

The USG™ Drywall Suspension System for Flat and Curved Ceilings is covered by the following Construction Specification Institute (CSI) MasterFormat® codes.

09 22 26.23 Metal Suspension System

Corresponding applicable UNSPSC codes include:

25172000 Suspension System Components

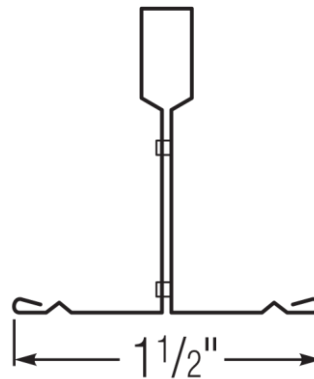
#### 1.2 Designated Application

The USG™ Drywall Suspension System for Flat and Curved Ceilings consists of main tees, cross tees and ancillary products (see USG product literature for typical installation instructions) that are assembled to provide a structure for the support of metal or non-metal ceiling panels.

#### 1.3 Product Technical Data

##### Performance Attributes

- **Class A**
- **Fire-rated**
- **G90 galvanized system available**
- **Wind load tested and approved**



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### 1.4 Placing on the Market/Application Rules

The USG™ Drywall Suspension System for Flat and Curved Ceilings must be installed in accordance with all applicable USG installation guidelines and in accordance with ASTM C636 Standard Practice of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels. An approved installation guide entitled, Acoustical Suspension System – Installation Guide: Suspended Ceiling, is available on usg.com and cginc.com.

### 1.5 Delivery Status

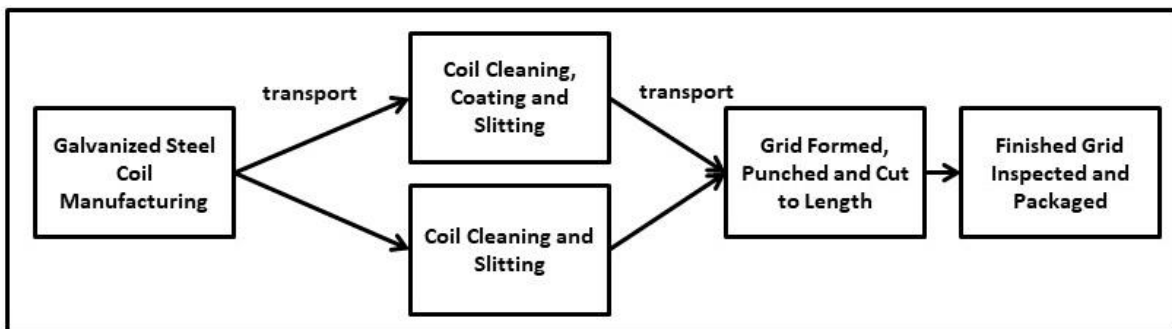
The USG™ Drywall Suspension System for Flat and Curved Ceilings arrives at the jobsite in cardboard boxes, which have been modeled in this study.

### 1.6 Product Composition

Table 1.2: Product composition

Material	USG™ Drywall Suspension System for Flat and Curved Ceilings
Galvanized Steel Coil	100.0%
Total	100.0%

### 1.7 Product Manufacture



During the manufacturing process, a piece of galvanized steel coil is formed into the proper configuration using a series of driven dies. A clip is attached to both ends of the main tee and cross tee members allowing for connection of the various pieces. All process scrap is recycled.



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### 1.8 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 review and select each material we use. Each decision we make is based on careful consideration of environmental and safety effects. Raw materials used in our products are carefully selected and go through a screening procedure. 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.

### 1.9 Packaging

USG™ Drywall Suspension System for Flat and Curved Ceilings is packaged in cardboard boxes. USG encourages the proper recycling of these cardboard boxes. Both the production and disposal of these packaging materials were modeled in this study

### 1.10 Conditions of Use

To ensure the longevity of the product, USG Drywall Suspension System for Flat and Curved Ceilings should not be exposed to moisture, high humidity, or high temperature. Details for conditions of use may be found in the product specifications.

### 1.11 Distribution

The default transport distances per PCR (product transport from the point of manufacture to building site) of 497 miles (800 km) by diesel powered truck/trailer were used in this analysis.

### 1.12 Product Installation

The USG™ Drywall Suspension System for Flat and Curved Ceilings must be installed according to ASTM C636, ASTM E580, ASTM C754 and USG requirements. Alternate installation methods may be used when approved by the authority having jurisdiction. Approved installation guides entitled, [USG Exterior Ceiling Systems Installation Guide \(SC3212\)](#) and [USG Exterior Ceiling Application System Guide \(SC2561\)](#), are available on [usg.com](#) and [cgcinc.com](#). Installation of this product is accomplished by manual labor using mostly hand tools. No material or energy inputs are required on the jobsite. Per the PCR, a 7% waste factor was used in this LCA study.

### 1.13 Environment and Health During Use Stage

This product is not expected to produce any unusual hazards during normal use.

### 1.14 Reference Service Life

The USG™ Drywall Suspension System for Flat and Curved Ceilings is a metal ceiling suspension system. Once installed, it should require no maintenance, refurbishment, or replacement. Accordingly, a default RSL of 75 years is assumed for this product. An assumed Estimated Service Life (ESL) of 75 years shall be used for building life.



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### 1.15 Re-Use Phase

With proper care, USG™ Drywall Suspension System for Flat and Curved Ceilings components are designed for disassembly and may be reused at the end of a building's life.

### 1.16 End-of-Life Disposal

USG™ Drywall Suspension System for Flat and Curved Ceilings components are assumed to be recycled at end of life. Product disposal was modeled according to the guidelines provided in Part A, Table 2 (Product Disposal Assumptions by Region).

### 1.17 – Extraordinary Effects

#### Fire

All products covered by this EPD are certified to be Class A (flame spread of 25 or less, smoke developed of 50 or less per ASTM E84 or CAN ULc S102).

#### 1.17.1 – Further Information

Further information can be found at [usg.com](http://usg.com) and [cgcinc.com](http://cgcinc.com).

## 2. LCA Calculation Rules

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### 2.1 EPD Type

This EPD is a product specific, plant averaged EPD.

### 2.2 Functional Unit

The functional unit is defined as 0.092 square meters with optional reporting of one square foot (12"x12") of installed product.

	USG Drywall Suspension System for Flat and Curved Ceilings
Functional Unit	2.06E+00 kg/sm

Table 2.1: Functional unit



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### 2.2 System Boundary

This EPD represents a “cradle-to-grave” LCA analysis for USG™ Drywall Suspension System for Flat and Curved Ceilings. It covers all the production steps from raw material extraction (i.e., the cradle) to end of life disposal (grave).

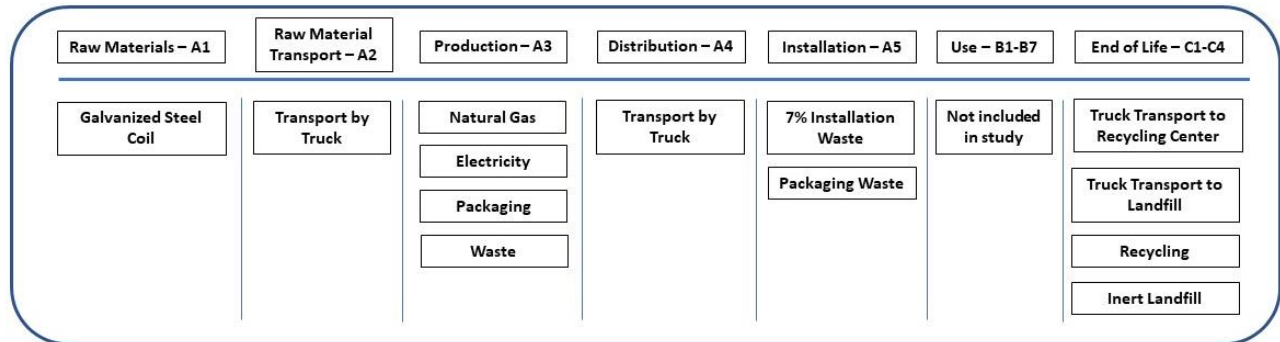


Figure 2.1: Specific processes covered by this EPD by life cycle stage

### 2.3 Estimates and Assumptions

The results are limited by the use of proxy processes rather than actual supplier generated primary data. This would include such processes as the production of the aluminum coil, which is specific to North America and covers the coil thickness used in this product but is not specific to the manufacturer used by USG. In addition, the data is limited in that the primary data was collected during 2022 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. Both human activity and capital equipment were excluded from the system boundary.



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### 2.4 Cut-off Criteria

The requirements for the exclusion of inputs and outputs (cut-off rules) follows the guidance in ISO 21930 Section 7.1.8.

### 2.5 Background Data

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

### 2.6 Data Requirements and Data Sources

The LCA model was created using the LCA for Experts software from Sphera (Version 10.7.1.28; Schema 8007). 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 2022 production year.

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

**Technical:** Where possible, 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 data.

**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 2022 calendar year.

### 2.8 Allocation

No allocation was required in this study. The LCI data was collected for the 2022 production year.



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### 3. LCA: Scenarios and additional technical information

**Table 3.1. Transport to the building site (A4)**

Name	USG™ Drywall Suspension System for Flat and Curved Ceilings	Unit
Fuel type	Diesel	-
Liters of fuel (including	3.75E-03	l/100km/sm
Vehicle type	US Truck	-
Transport distance	800	km
Capacity	0.67	
Gross density of products transported (assembly only)	7,700	kg/m <sup>3</sup>

**Table 3.2. Installation into the building (A5)**

NAME	VALUE	UNIT
Ancillary materials	0	kg/sm
Net freshwater consumption specified by water source and fate	0	m <sup>3</sup>
Other resources	0	kg
Electricity consumption	0	kWh
Other energy carriers	0	MJ
Material loss	7	%
Mounting System (CPMS)	0	kg/sm
Output substances following waste treatment on site	0	%
Dust in the air	~ 0	kg
VOC content	< 9	µg/m <sup>3</sup>

**Table 3.3. Use or application of the installed product (B1)**

NAME	VALUE	UNIT
RSL	75	years
VOC	< 9	µg/m <sup>3</sup>



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**Table 3.4. Maintenance (B2)**

NAME	VALUE	UNIT
Maintenance process information	As required by the PCR, a standard Life expectancy for ceiling panels based on historic practices of 75 years shall be used. No maintenance is required.	
Maintenance cycle	0	Number/ RSL
Maintenance cycle	0	Number/ ESL
Water consumption	0	m <sup>3</sup>
Auxiliary	0	kg
Other resources	0	kg
Electricity consumption	0	kWh
Other energy carriers	0	MJ
Material loss	0	kg

**Table 3.5. End of Life (C1-C4)**

Name		USG™ Drywall Suspension System for Flat and Curved Ceilings System	Unit
Collection process (specified by type)	Collected separately	0	kg
	Collected with mixed construction waste	0	kg/sm
Recovery (specified by type)	Reuse	0	kg
	Recycling (steel)	1.52E+00	kg/sm
	Landfill (steel)	5.40E-01	kg/sm
	Incineration	0	kg
	Incineration with	0	kg
	Energy conversion	0	-
Disposal	Product or material for final deposition	2.06E+00	kg/sm
Removals of biogenic carbon (excluding packaging)		0	kg/sm



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### 4. Environmental Indicators Derived from LCA

#### 4.1 Life Cycle Assessment Results

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 Demolition	Transport	Waste processing	Disposal
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Figure 2: System Boundary

The following tables provide the LCA results for the USG Drywall Suspension System – Flat & Curved Ceilings. These results are for the USG grid plants in Stockton, CA, and Westlake, OH with the results weighted using the production volume for each product at each plant.

Environmental Impact Category	Units	A1-A3	A4	A5	C1	C2	C3	C4	Total A1-C4	D
Global Warming Potential, excl. biogenic carbon (GWP)	kg CO2 eq.	5.74E+00	1.05E-01	5.06E-01	0.00E+00	2.57E-02	0.00E+00	8.01E-03	6.39E+00	-2.81E+00
Ozone Depletion Potential (ODP)	kg CFC 11-eq.	2.87E-09	2.72E-16	2.16E-10	0.00E+00	6.67E-17	0.00E+00	4.23E-17	3.09E-09	7.69E-14
Acidification Potential (AP)	kg SO2 eq.	1.47E-02	4.21E-04	1.20E-03	0.00E+00	6.30E-05	0.00E+00	5.00E-05	1.64E-02	-5.60E-03
Eutrophication Potential (EP)	kg N eq.	6.24E-04	3.89E-05	7.71E-05	0.00E+00	6.96E-06	0.00E+00	2.16E-06	7.49E-04	-3.35E-04
Photochemical Ozone Creation Potential (POCP)	kg O3-Equiv.	1.84E-01	9.73E-03	1.54E-02	0.00E+00	1.44E-03	0.00E+00	9.58E-04	2.12E-01	-6.04E-02
Abiotic Depletion Potential (ADP) fossil fuels	MJ surplus energy	3.04E+00	1.96E-01	2.58E-01	0.00E+00	4.81E-02	0.00E+00	1.36E-02	3.56E+00	-3.57E-03

Environmental Impact Category	Units	A1-A3	A4	A5	C1	C2	C3	C4	Total A1-C4	D
Global Warming Potential, excl. biogenic carbon (GWP)	kg CO2 eq.	5.33E-01	9.75E-03	4.70E-02	0.00E+00	2.38E-03	0.00E+00	7.44E-04	5.93E-01	-2.61E-01
Ozone Depletion Potential (ODP)	kg CFC 11-eq.	2.67E-10	2.53E-17	2.01E-11	0.00E+00	6.20E-18	0.00E+00	3.93E-18	2.87E-10	7.14E-15
Acidification Potential (AP)	kg SO2 eq.	1.37E-03	3.91E-05	1.12E-04	0.00E+00	5.85E-06	0.00E+00	4.65E-06	1.53E-03	-5.20E-04
Eutrophication Potential (EP)	kg N eq.	5.80E-05	3.61E-06	7.16E-06	0.00E+00	6.47E-07	0.00E+00	2.00E-07	6.96E-05	-3.11E-05
Photochemical Ozone Creation Potential (POCP)	kg O3-Equiv.	1.71E-02	9.04E-04	1.43E-03	0.00E+00	1.33E-04	0.00E+00	8.90E-05	1.97E-02	-5.61E-03
Abiotic Depletion Potential (ADP) fossil fuels	MJ surplus energy	2.82E-01	1.82E-02	2.39E-02	0.00E+00	4.47E-03	0.00E+00	1.26E-03	3.30E-01	-3.32E-04



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### North American LCA Environmental Impacts - 1 Metric Ton of Drywall Suspension - Flat & Curved

Environmental Impact Category	Units	A1-A3	A4	A5	C1	C2	C3	C4	Total A1-C4	D
Global Warming Potential, excl. biogenic carbon (GWP)	kg CO2 eq.	2.79E+03	5.10E+01	2.46E+02	0.00E+00	1.25E+01	0.00E+00	3.89E+00	3.10E+03	-1.37E+03
Ozone Depletion Potential (ODP)	kg CFC 11-eq.	1.39E-06	1.32E-13	1.05E-07	0.00E+00	3.24E-14	0.00E+00	2.05E-14	1.50E-06	3.73E-11
Acidification Potential (AP)	kg SO2 eq.	7.14E+00	2.05E-01	5.84E-01	0.00E+00	3.06E-02	0.00E+00	2.43E-02	7.98E+00	-2.72E+00
Eutrophication Potential (EP)	kg N eq.	3.03E-01	1.89E-02	3.75E-02	0.00E+00	3.38E-03	0.00E+00	1.05E-03	3.64E-01	-1.63E-01
Photochemical Ozone Creation Potential (POCP)	kg O3-Equiv.	8.97E+01	4.73E+00	7.48E+00	0.00E+00	6.98E-01	0.00E+00	4.65E-01	1.03E+02	-2.93E+01
Abiotic Depletion Potential (ADP) fossil fuels	MJ surplus energy	1.48E+03	9.54E+01	1.25E+02	0.00E+00	2.34E+01	0.00E+00	6.60E+00	1.73E+03	-1.74E+00

### Resource Usages for 1 Square Meter of Drywall Suspension - Flat & Curved

Use of Primary Resources	Units	A1-A3	A4	A5	C1	C2	C3	C4	Total A1-C4	D
Renewable primary resources used as an energy carrier (RPRE)	MJ, NCV	4.55E+00	5.91E-02	3.55E-01	0.00E+00	1.45E-02	0.00E+00	1.46E-02	4.99E+00	1.12E+00
Renewable primary resources with energy content used as material (RPRM)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable primary resources used as an energy carrier (NRPRE)	MJ, NCV	6.67E+01	1.48E+00	5.24E+00	0.00E+00	3.64E-01	0.00E+00	1.08E-01	7.39E+01	-2.83E+01
Non-renewable primary resources with energy content used as material (NRPRM)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
<b>Secondary material, secondary fuel and recovered energy</b>	<b>Units</b>	<b>A1-A3</b>	<b>A4</b>	<b>A5</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>	<b>Total A1-C4</b>	<b>D</b>
Secondary material (SM)	kg	6.99E-03	0.00E+00	5.26E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.51E-03	0.00E+00
Renewable secondary fuel (RSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Consumption of fresh water	m3	3.71E-01	2.03E-04	2.80E-02	0.00E+00	4.97E-05	0.00E+00	2.67E-05	4.00E-01	-2.88E-01
<b>Additional inventory parameters for transparency</b>	<b>Units</b>	<b>A1-A3</b>	<b>A4</b>	<b>A5</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>	<b>Total A1-C4</b>	<b>D</b>
Removals and emissions associated with biogenic carbon content of the bio-based product	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Emission from calcination and uptake from carbonation	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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.	-7.88E-04	0.00E+00	7.88E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Emissions from land use change	kg CO2-eq.	1.09E-03	1.20E-04	9.92E-05	0.00E+00	2.94E-05	0.00E+00	2.40E-05	1.37E-03	-3.79E-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	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
<b>Indicators describing waste</b>	<b>Units</b>	<b>A1-A3</b>	<b>A4</b>	<b>A5</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>	<b>Total A1-C4</b>	<b>D</b>
Hazardous waste disposed	kg	2.75E-05	4.27E-12	2.07E-06	0.00E+00	1.05E-12	0.00E+00	1.15E-11	2.96E-05	-2.12E-07
Non-hazardous waste disposed	kg	1.12E-01	1.29E-04	7.40E-02	0.00E+00	3.17E-05	0.00E+00	5.40E-01	7.27E-01	3.42E-01
High-level radioactive waste	kg	9.21E-05	4.26E-06	8.16E-06	0.00E+00	1.04E-06	0.00E+00	1.14E-06	1.07E-04	3.10E-06
Intermediate and low-level waste	kg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Assignments of output flows at the end-of-life</b>	<b>Units</b>	<b>A1-A3</b>	<b>A4</b>	<b>A5</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>	<b>Total A1-C4</b>	<b>D</b>
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	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	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00



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## USG Drywall Suspension System – Flat & Curved Ceilings

Stockton, CA, Westlake, OH



### Resource Usages for 1 Square Foot of Drywall Suspension - Flat & Curved

Use of Primary Resources	Units	A1-A3	A4	A5	C1	C2	C3	C4	Total A1-C4	D
Renewable primary resources used as an energy carrier (RPRE)	MJ, NCV	4.22E-01	5.49E-03	3.29E-02	0.00E+00	1.35E-03	0.00E+00	1.35E-03	4.64E-01	1.04E-01
Renewable primary resources with energy content used as material (RPRM)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable primary resources used as an energy carrier (NRPRE)	MJ, NCV	6.19E+00	1.38E-01	4.87E-01	0.00E+00	3.38E-02	0.00E+00	1.01E-02	6.86E+00	-2.63E+00
Non-renewable primary resources with energy content used as material (NRPRM)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
<b>Secondary material, secondary fuel and recovered energy</b>										
Secondary material (SM)	kg	6.49E-04	0.00E+00	4.88E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.98E-04	0.00E+00
Renewable secondary fuel (RSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Consumption of fresh water	m3	3.45E-02	1.88E-05	2.60E-03	0.00E+00	4.62E-06	0.00E+00	2.48E-06	3.71E-02	-2.67E-02
<b>Additional inventory parameters for transparency</b>										
Removals and emissions associated with biogenic carbon content of the bio-based product	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Emission from calcination and uptake from carbonation	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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.	-7.32E-05	0.00E+00	7.32E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Emissions from land use change	kg CO2-eq.	1.02E-04	1.11E-05	9.22E-06	0.00E+00	2.73E-06	0.00E+00	2.23E-06	1.27E-04	-3.52E-05
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	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
<b>Indicators describing waste</b>										
Hazardous waste disposed	kg	2.56E-06	3.97E-13	1.93E-07	0.00E+00	9.72E-14	0.00E+00	1.07E-12	2.75E-06	-1.97E-08
Non-hazardous waste disposed	kg	1.04E-02	1.20E-05	6.87E-03	0.00E+00	2.94E-06	0.00E+00	5.02E-02	6.75E-02	3.18E-02
High-level radioactive waste	kg	8.55E-06	3.95E-07	7.58E-07	0.00E+00	9.69E-08	0.00E+00	1.05E-07	9.91E-06	2.88E-07
Intermediate and low-level waste	kg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Assignments of output flows at the end-of-life</b>										
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	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	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

### Resource Usages for 1 Metric Ton of Drywall Suspension - Flat & Curved

Use of Primary Resources	Units	A1-A3	A4	A5	C1	C2	C3	C4	Total A1-C4	D
Renewable primary resources used as an energy carrier (RPRE)	MJ, NCV	2.21E+03	2.87E+01	1.72E+02	0.00E+00	7.04E+00	0.00E+00	7.08E+00	2.42E+03	5.42E+02
Renewable primary resources with energy content used as material (RPRM)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable primary resources used as an energy carrier (NRPRE)	MJ, NCV	3.24E+04	7.21E+02	2.54E+03	0.00E+00	1.77E+02	0.00E+00	5.26E+01	3.59E+04	-1.37E+04
Non-renewable primary resources with energy content used as material (NRPRM)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
<b>Secondary material, secondary fuel and recovered energy</b>										
Secondary material (SM)	kg	3.39E+00	0.00E+00	2.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.65E+00	0.00E+00
Renewable secondary fuel (RSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Consumption of fresh water	m3	1.80E+02	9.85E-02	1.36E+01	0.00E+00	2.41E-02	0.00E+00	1.30E-02	1.94E+02	-1.40E+02
<b>Additional inventory parameters for transparency</b>										
Removals and emissions associated with biogenic carbon content of the bio-based product	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Emission from calcination and uptake from carbonation	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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.	-3.83E-01	0.00E+00	3.83E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Emissions from land use change	kg CO2-eq.	5.32E-01	5.82E-02	4.82E-02	0.00E+00	1.43E-02	0.00E+00	1.17E-02	6.64E-01	-1.84E-01
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	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
<b>Indicators describing waste</b>										
Hazardous waste disposed	kg	1.34E-02	2.07E-09	1.01E-03	0.00E+00	5.08E-10	0.00E+00	5.59E-09	1.44E-02	-1.03E-04
Non-hazardous waste disposed	kg	5.44E+01	6.28E-02	3.59E+01	0.00E+00	1.54E-02	0.00E+00	2.63E+02	3.53E+02	1.66E+02
High-level radioactive waste	kg	4.47E-02	2.07E-03	3.97E-03	0.00E+00	5.07E-04	0.00E+00	5.52E-04	5.18E-02	1.51E-03
Intermediate and low-level waste	kg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Assignments of output flows at the end-of-life</b>										
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	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	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00



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## USG Drywall Suspension System – Flat & Curved Ceilings

Stockton, CA, Westlake, OH

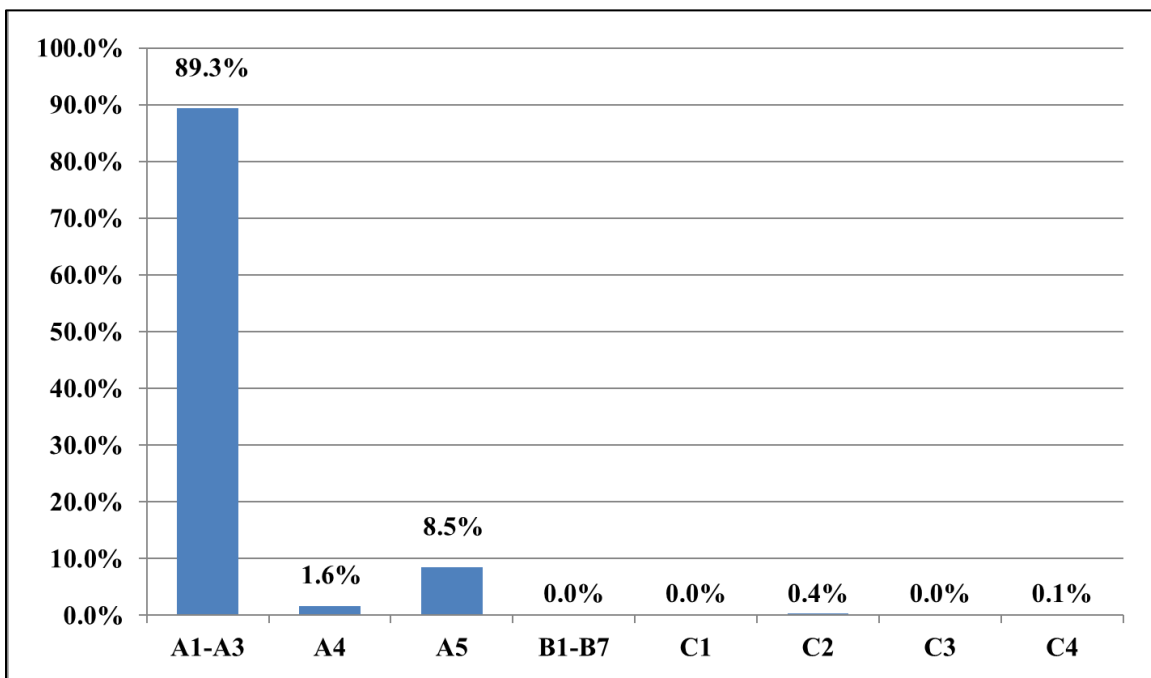


Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building or construction works has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase only when product or construction works performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted. Any comparison of EPDs shall be subject to the requirements of ISO 21930 or EN 15804. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparisons can be inaccurate and could lead to erroneous selection of materials or products that are higher impact, at least in some impact categories.

### 5. LCA Interpretation

The A1-C4 LCA results for the USG™ Drywall Suspension System for Flat and Curved Ceilings were dominated by product manufacturing; specifically the production of the steel coil.

**Figure 3: Process Dominance Analysis for GWP for the Production of USG™ Drywall Suspension System for Flat and Curved Ceilings**



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## USG Drywall Suspension System – Flat & Curved Ceilings

Stockton, CA, Westlake, OH



### 6. References

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#### LCA Report

A Cradle-to-Gate and Cradle-to-Grave Life Cycle Assessment of USG Suspension System Products, 2/5/24. USG (Confidential)

#### Product PCR

PCR for Building-Related Products and Services - Part A: Calculation Rules for the LCA and Requirements Project Report, (IBU/UL Environment document number 10010, revision V3.2, December 2018)

UL Environment: Product Category Rules for Building-Related Products and Services Part B: Metal Ceiling and Wall System EPD Requirements, January 15, 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/Amended 1:2020 - Environmental management – Life cycle assessment – Principles and framework

ISO 14044:2006/amended 2: 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



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