

# Environmental Product Declaration

## USG Juno™ High-NRC Acoustical Ceiling Panels (95/30)

Cloquet, MN



### Features and Benefits

- Balanced Acoustics. Excellent 0.95 NRC sound absorption with sound attenuation of 30 CAC.
- Monolithic appearance with smooth finish.
- Washable and scrubbable.
- Impact and scratch resistant.
- Coordinates with USG Donn® Brand grid color Reserve White 4250, available in DXT™, DXF™, DXFF™, and DXI™ suspension system profiles.
- ClimaPlus™ 30-year limited system warranty against visible sag, mold, and mildew.
- GREENGUARD Gold certified for low emitting performance.
- USG Juno™ Acoustical Panels are part of the Ecoblueprint™ portfolio – meeting today's sustainability standards. For sustainability documentation go to [USG.com](http://USG.com) or [CGCInc.com](http://CGCInc.com).



TRACI v2.1 ENVIRONMENTAL IMPACTS)		
Functional Unit – 1 sf (0.0929 square meters)	Cradle-to-Gate (A1-A3)	Cradle-to-Grave (A1-C4)
Global Warming Potential (kg CO <sub>2</sub> eq.)	7.93E-01	9.20E-01
Ozone Depletion Potential (kg CFC-11 eq.)	6.77E-09	7.28E-09
Acidification Potential (kg SO <sub>2</sub> eq.)	2.22E-03	2.61E-03
Eutrophication Potential (kg N eq.)	2.90E-04	3.58E-04
Photochemical Ozone Creation Potential (kg O <sub>3</sub> eq.)	4.15E-02	4.74E-02
Abiotic Resource Depletion Potential Fossil Fuels (MJ, LHV)	1.74E+00	1.97E+00

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 605	
EPD TYPE	Product specific, facility specific 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	1.3 in. Juno™ High-NRC (95/30) Acoustical Ceiling Panels	
DATE OF ISSUE	12/11/23	
PERIOD OF VALIDITY	5 Years	
CORE STANDARD	ISO 21930	
CORE PCR	UL Environment: Product Category Rules for Building-Related Product and Services - Part A: Calculation Rules for the LCA and Requirements. ULE 10010 V3.2, December 2018.	
SUB-CATEGORY PCR	UL Environment: PCR Guidance for Building-Related Products and Services; Part B: Non-Metal Ceiling Panel EPD Requirements; April 13, 2021	
SUB-CATEGORY PCR REVIEW	The review process included a public consultation period from 12/16/20 – 1/16/21 and a review panel comprising Dr. Landita Bushi, Dr. Tom Gloria and Olivia Palmer.	
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 and Product Identification

Juno™ High-NRC (95/30) Acoustical Ceiling Panels are manufactured using a unique process that maximizes sound and anti-sag performance, producing excellent noise reduction coefficient and solid ceiling attenuation class (CAC) performance.

The wet-formed mineral fiber family of products consists of a latex/starch-bound mineral wool basemat optionally laminated with a non-woven veil. These products generally fall under ASTM E1264-22; Type IV, Form 1 and 2, Pattern G, ASTM E1264-23; Type A, Form A2.1 and A2.2, Pattern G. CAS Masterformat number 09 51 00.

#### 1.2 Designated Application

The products covered by this EPD are designed to be installed in a suitable metal grid system typically designed to accommodate a nominal 2'x2' or 2'x4' panel although other sizes are available. They are suitable for offices, healthcare, classrooms and corridors, reception areas and lobbies, department stores, retail, restaurants and hospitality spaces.

#### 1.3 Product Technical Data

Table 1: Summary of the technical data

Name	Test Method	Juno™ High-NRC Acoustical Ceiling Panels (95/30)
Noise Reduction Coefficient (NRC)	C423	0.95
Articulation Class (AC)	E1111 and Classification E1110	N/A
Ceiling Attenuation Class (CAC)	E1414 and Classification E413	30
Fire Rating	E84	Class A
Light Reflectance	E1477	0.85

#### 1.4 Placing on the Market/Application Rules

Acoustical ceiling panels must be installed and maintained in accordance with current USG written instructions and best industry practice, including the CISCA Handbook and ASTM C636, "Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels."

#### 1.5 Delivery Status

Juno™ High-NRC acoustical ceiling panels arrive at the jobsite in a shrink-wrapped wrap-around carton.



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### 1.6 Product Composition

Table 2 presents the main product components. Biogenic content in the product constitutes less than 5% of the total and is not reported separately in this document.

**Table 2: Product specifications and formula**

Material	Juno™ High-NRC Acoustical Ceiling Panels (95/30)
Mineral Wool	83.8%
Binder	6.4%
Additives	1.4%
Adhesive	0.5%
Veil	2.6%
Dry coating	6.3%
<b>Sum</b>	<b>100%</b>

### 1.7 Product Manufacture

In wet-formed mineral fiber production, the tile ingredients are mixed into a dilute slurry, which is then formed onto a wire as a basemat. The basemats are then pressed and dried. The dried panels are laminated, 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 ceiling tiles 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. The finishing unit processes are dominated by the use of water-based paint, which contains ingredients such as calcium carbonate, clay, latex, titanium dioxide (TiO<sub>2</sub>) and other chemicals. The main processes included in the LCA study are presented in Figure 1. This product is manufactured exclusively at the Cloquet, MN manufacturing plant.

### 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 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.



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### 1.9 Packaging

USG Interiors ceiling panels are packaged using cardboard sleeves (4.4E-03 kg/sf) and are then wrapped in plastic shrink wrap (1.05E-03 kg/sf). Both the production and disposal of these packaging materials was modeled in this study.

### 1.10 Conditions of Use

To ensure 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 Distribution

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

### 1.12 Product Installation

The ceiling panels must be installed in accordance with all applicable USG Interiors installation guidelines. Approved installation procedures are provided in the Ceiling Systems Handbook published by the Ceiling and Interior Systems Construction Association and must be followed. Installation of USG's ceiling and grid products is accomplished by manual labor using mostly hand tools. A 7% installation waste factor was used in this study. No material or energy inputs are required on the jobsite. Exposure to high dust levels may irritate the skin, eyes, nose, throat, or upper respiratory tract. Proper personal protective gear should be worn by the installer for protection.

### 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

A default RSL of 75 years shall be assumed for the product and ceiling panel mounting system. An assumed Estimated Service Life (ESL) of 75 years shall be used for building life.

### 1.15 Re-Use Phase

Ceiling panels cannot generally be reused at the end of a building's 75-year life.

### 1.16 End-of-Life Disposal

USG is helping to promote a circular economy 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 Recycle Program, all ceiling panel waste generated during installation and at end-of-life is assumed to be disposed of in an appropriate landfill. Final transportation from the building site to waste processing was defaulted to 22 miles (35 km) by truck.



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### 1.17 Extraordinary Effects

#### Fire

All ceiling products covered by this EPD are rated Class A (flame spread of 25 or less, smoke developed of 50 or less, as defined by ASTM E1264, and as tested according to ASTM E84).

#### Water

Moisture must not come in contact with the ceiling panel as a result of a leaking roof, a sweating pipe, a leaking radiator, a flood, condensation on windows, condensation on more subtle surfaces where dew points are reached, humidified air from the HVAC system or any other similar causes.

#### Mechanical Destruction

The product must be installed and maintained in accordance with current USG written instructions and best industry practice, including the Cisca Handbook and ASTM C636, "Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels."

## 2. LCA Calculation Rules

### 2.1 EPD Type

This EPD is a product specific, facility specific EPD.

### 2.2 Functional Unit

The declared unit for ceiling panels is defined as one square meter with optional reporting of one square foot (12"x12") of ceiling panel.

**Table 3: Functional unit**

NAME	JUNO™ HIGH-NRC ACOUSTICAL CEILING PANELS (METRIC)	JUNO™ HIGH-NRC ACOUSTICAL CEILING PANELS (STANDARD)
Functional Unit	0.0929 m <sup>2</sup>	1 ft <sup>2</sup>
Declared Thickness	3.30 cm	1.30 in
Density	168 kg/m <sup>3</sup>	12.0 pcf
Surface weight per declared	6.71 kg/m <sup>2</sup>	1.38 lb./ft <sup>2</sup>



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### 2.3 System Boundary

This EPD represents a “cradle-to-grave” LCA analysis for wet-formed mineral fiber ceiling panels. It covers all the production steps from raw material extraction (i.e., the cradle) to end of life disposal (grave).

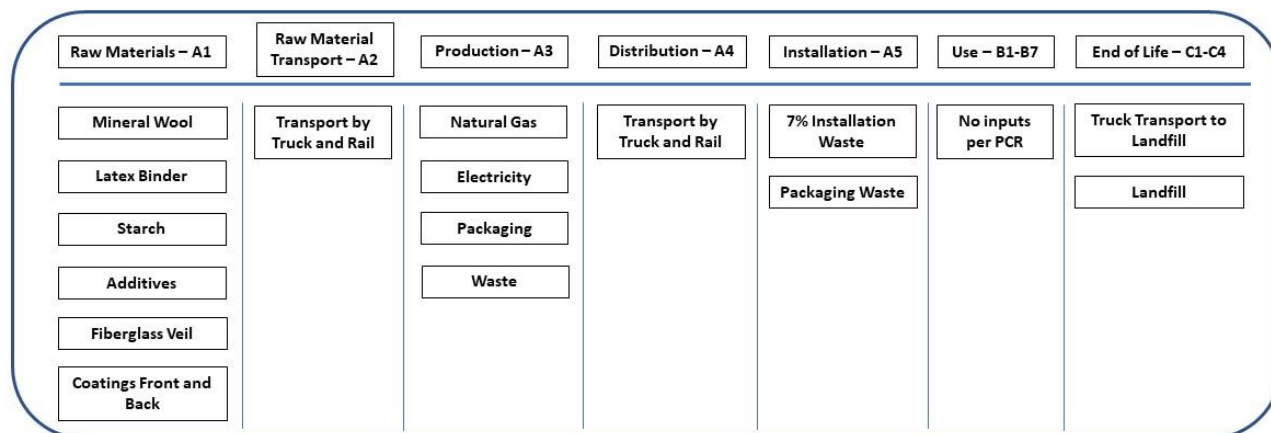


Figure 1: Specific processes covered by this EPD by life cycle stage

### 2.4 Estimates and Assumptions

Primary energy and raw material input data was collected from the Cloquet, MN plant for the 2022 calendar year. Data collection of energy and raw material inputs was aided by the presence of an extensive computer monitoring system which tracked product formulas by product type. All wet-formed mineral fiber ceiling 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 2022 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.

### 2.5 Cut-off Criteria

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

### 2.6 Background Data

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



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### 2.6 Data Quality 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 wet-formed mineral fiber ceiling tile production, the LCI data was collected from the Cloquet, MN plant for the 2022 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 on finished products, coatings usage plant data and product formulas.

**Completeness:** Virtually all the significant raw material flows (> 99%) in wet-formed mineral fiber ceiling panel production have 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 Renewable Energy

Parameter	Value
Electricity Source	Offsite
Renewable fuel type	Wind
Percent of EPD Owner's product-related electricity covered	100%
If < 100%, grid type used to model remaining electricity	N/A
Commitment pledged for entire validity of EPDs	Yes

### 2.8 Period Under Review

All raw material and energy inputs are for the 2022 calendar year.



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### 2.9 Allocation

The LCI data was collected for the Cloquet ceiling tile production plant for the 2022 production year. Raw material inputs are specific to these panels and energy inputs were allocated based on the mass of the panels.

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

**Table 4. Transport to the building site (A4)**

NAME	VALUE	UNIT
Fuel type	Diesel	-
Liters of fuel	1.35E-03	l/100km
Vehicle type	US Truck	-
Transport distance	800	km
Capacity	0.67	
Gross density of products transported	192	kg/m <sup>3</sup>

**Table 5. Installation into the building (A5)**

NAME	VALUE	UNIT
Ancillary materials	0	kg
Net freshwater consumption	0	m <sup>3</sup>
Other resources	0	kg
Electricity consumption	0	kWh
Other energy carriers	0	MJ
Product loss per functional unit	4.84E-02	kg/sf
Waste materials at the construction site before waste processing, generated by product installation	4.84E-02	kg/sf
Output materials resulting from on-site waste processing	4.84E-02	kg/sf
Mass of packaging waste, cardboard	4.7E-03	kg/sf
Mass of packaging waste, plastic film	1.13E-03	kg/sf
Biogenic carbon contained in packaging	1.53E-02	kg CO <sub>2</sub>
Direct emission to ambient air, soil, and water	~ 0	kg/sf
VOC emissions	< 9	µg/m <sup>3</sup>

**Table 6. 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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### Maintenance (B2), Repair (B3), Replacement (B4), Refurbishment (B5)

Non-metal ceiling and wall panels shall be assumed to not need repainting, maintenance, or repairing and to last the entire duration of the building ESL with no replacement or refurbishment.

**Table 8. End of Life (C1-C4)**

NAME		JUNO™ HIGH-NRC PANELS	UNIT
Demolition (module C1)			
Transport (module C2)			
Collection process (specified by type)	Collected separately	0	kg
	Collected with mixed construction waste	0.584	kg/sf
Recovery (specified by type)	Reuse	0	kg
	Recycling	0	kg
	Landfill	0.584	kg/sf
	Incineration	0	kg
	Incineration with energy recovery	0	kg
	Energy conversion efficiency rate	N/A	N/A
Disposal	Product or material for final deposition	0.584	kg/sf

## 4. Life Cycle Assessment Results

Product stage				Construction process stage				Use stage				End of life stage			
Raw Material Supply	Transport	Manufacturing	Transport	Construction-Installation P 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**



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### 4.1 Life Cycle Impact Assessment Results

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 9: LCA Results using TRACI 2.1 Impacts

Life Cycle Environmental Impact Results for 1 Square Foot of Juno™ High-NRC Acoustical Ceiling Panels (95/30) (A1-C4)										
North American LCA Environmental Impact Results										
Impact Assessment Method: TRACI 2.1		A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total A1-C4
Environmental Impact Category	Units	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Impact
Global Warming Potential (GWP)	kg CO2 eq.	7.93E-01	3.83E-02	7.83E-02	0.00E+00	0.00E+00	1.59E-03	0.00E+00	8.47E-03	9.20E-01
Ozone Depletion Potential (ODP)	kg CFC 11 eq.	6.77E-09	1.03E-16	5.10E-10	0.00E+00	0.00E+00	4.14E-18	0.00E+00	4.66E-16	7.28E-09
Acidification Potential (AP)	kg SO2 eq.	2.22E-03	5.61E-05	2.73E-04	0.00E+00	0.00E+00	4.47E-06	0.00E+00	5.25E-05	2.61E-03
Eutrophication Potential (EP)	kg N eq.	2.90E-04	8.13E-06	5.74E-05	0.00E+00	0.00E+00	4.68E-07	0.00E+00	2.32E-06	3.58E-04
Photochemical Ozone Creation Potential (POCP)	kg O3 eq.	4.15E-02	1.26E-03	3.53E-03	0.00E+00	0.00E+00	1.02E-04	0.00E+00	9.98E-04	4.74E-02
Abiotic Depletion Potential (ADP) fossil fuels	MJ surplus energy	1.74E+00	7.45E-02	1.39E-01	0.00E+00	0.00E+00	2.98E-03	0.00E+00	1.45E-02	1.97E+00

Table 10: LCA Results for Resources Usages

Resource and Waste Flows for 1 Square Foot of Juno™ High-NRC Acoustical Ceiling Panels (95/30) (A1-C4)										
Use of Primary Resources										
		A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total A1-C4
Renewable primary resources used as an energy carrier (RPRE)	MJ, NCV	6.24E+00	2.24E-02	4.73E-01	0.00E+00	0.00E+00	8.99E-04	0.00E+00	1.88E-02	6.75E+00
Renewable primary resources with energy content used as material (RPRM)	MJ, NCV	9.47E-03	0.00E+00	7.13E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E-02
Non-renewable primary resources used as an energy carrier (NRPRE)	MJ, NCV	1.17E+01	5.63E-01	9.43E-01	0.00E+00	0.00E+00	2.26E-02	0.00E+00	1.15E-01	1.34E+01
Non-renewable primary resources with energy content used as material (NRPRM)	MJ, NCV	7.07E-05	0.00E+00	5.32E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.60E-05
Secondary material, secondary fuel and recovered energy										
		A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total A1-C4
Secondary material (SM)	kg	1.55E-01	0.00E+00	1.17E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.67E-01
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	5.82E-03	7.69E-05	4.55E-04	0.00E+00	0.00E+00	3.08E-06	0.00E+00	2.89E-05	6.39E-03
Additional inventory parameters for transparency										
		A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total A1-C4
Removals and emissions associated with biogenic carbon content of the bio-based product	kg CO2-eq.	-8.88E-02	0.00E+00	-6.69E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.55E-02	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.	-1.60E-02	0.00E+00	-1.21E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.72E-02	0.00E+00
Emissions from land use change	kg CO2-eq.	2.14E-04	4.54E-05	1.99E-05	0.00E+00	0.00E+00	1.82E-06	0.00E+00	2.68E-05	3.08E-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
Indicators describing waste										
		A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total A1-C4
Hazardous waste disposed	kg	2.15E-05	1.62E-12	1.62E-06	0.00E+00	0.00E+00	6.49E-14	0.00E+00	2.47E-12	2.31E-05
Non-hazardous waste disposed	kg	7.87E-02	4.90E-05	4.53E-02	0.00E+00	0.00E+00	1.96E-06	0.00E+00	5.74E-01	6.98E-01
High-level radioactive waste	kg	2.44E-04	1.61E-06	1.87E-05	0.00E+00	0.00E+00	6.47E-08	0.00E+00	1.29E-06	2.66E-04
Intermediate and low-level waste	kg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Assignments of output flows at the end-of-life										
		A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total A1-C4
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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# Environmental Product Declaration

## USG Juno™ High-NRC Acoustical Ceiling Panels (95/30)

Cloquet, MN

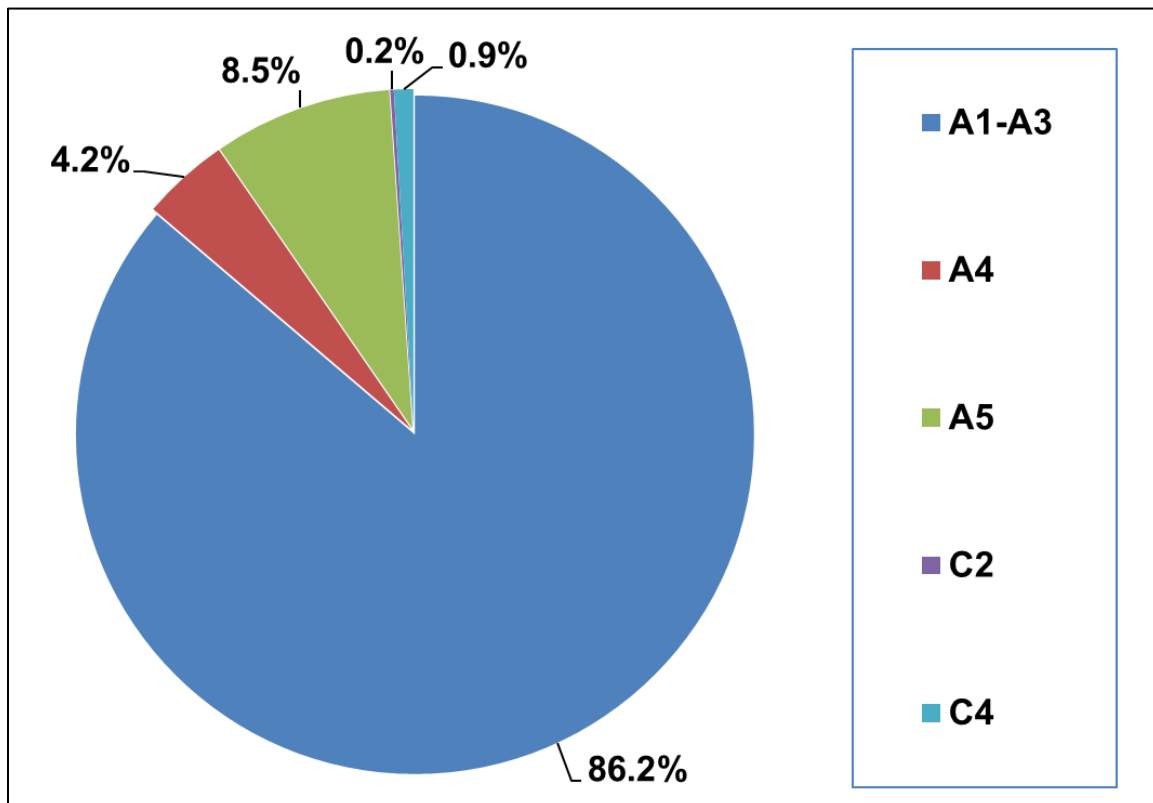


Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building or construction works has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase only when product or construction 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 LCA results for the production of wet-formed mineral fiber ceiling panels 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 Juno™ High-NRC (95/30) Acoustical Ceiling Panels**



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## USG Juno™ High-NRC Acoustical Ceiling Panels (95/30)

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### 6. References

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#### **LCA Report**

A Cradle-to-Gate (A1-A3) and Cradle-to-Grave (A1-C4) Life Cycle Assessment of Juno™ High-NRC Acoustical Ceiling Panels, 10/31/23. USG (Confidential)

#### **Product PCR**

UL Environment: Product Category Rules for Building-Related Product and Services - Part A: Calculation Rules for the LCA and Requirements. ULE 10010 V3.2, December 2018.

UL Environment: PCR Guidance for Building-Related Products and Services; Part B: Non-Metal Ceiling Panel EPD Requirements; April 13, 2021

#### **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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