Environmental Product Declaration
Radar™ Ceramic Acoustical Panels
Cloquet, MN

FEATURES AND BENEFITS

• 100% ceramic-bonded mineral fiber withstands high heat, high humidity, corrosive chemical fumes, and steam.
• Tested in live steam to withstand applications such as saunas and steam rooms.
• Meets U.S. Coast Guard standards and can be used in high-humidity marine applications.
• ClimaPlus™ 30-year limited system warranty against visible sag, mold, and mildew.
• Firecode® product designed to meet life-safety codes.

CRADLE-TO-GRAVE (A1-C4) FUNCTIONAL UNIT – 1 SQUARE FOOT (0.0929 SQUARE METERS)	5/8" RADAR™ CERAMIC ACOUSTICAL PANELS
Global Warming Potential (kg CO_2 eq.)	**8.20E-01**
Ozone Depletion Potential (kg CFC 11 eq.)	**5.37E-10**
Acidification Potential (kg SO_2 eq.)	**1.83E-03**
Eutrophication Potential (kg N eq.)	**1.58E-04**
Photochemical Ozone Creation Potential (kg O_3 eq.)	**2.89E-02**
Abiotic Resource Depletion Potential Fossil Fuels (MJ, LHV)	**1.80E+00**

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.

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

DECLARATION NUMBER	EPD 482
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 5/8" Radar™ Ceramic Acoustical Panels
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	This EPD is complete and contains the following: • Product System Documentation • LCA Calculation Rules • LCA: Scenarios and additional technical information • LCA Results • LCA Interpretation • References
This declaration was independently verified in accordance with ISO 14025 and ISO 21930:2017 □ INTERNAL ☒ 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

1. Product System Documentation

1.1 Product Description and Product Identification

Radar™ Ceramic panels are 100% ceramic-bonded mineral fiber panels that withstand high heat, high humidity, corrosive chemical fumes and steam. They are tested in live steam to withstand applications such as saunas and steam rooms and meet U.S. Coast Guard standards and can be used in high-humidity marine applications. Radar™ Ceramic have a ClimaPlus™ 30-year limited system warranty against visible sag. This product utilizes a ground wet-felted basemat consisting of perlite, mineral wool, paper fiber, starch and clay. Additional information regarding Radar™ Ceramic products can be found at usg.com and cgcinc.com. These products generally fall under ASTM E1264 Section 5.2 designation as Type III—Mineral base with painted finish. The modifications typically involve modifications to the thickness, density, basemat composition and/or coating package.

This EPD covers the following 5/8" Radar™ Ceramic acoustical panels: item numbers: 56644 and 56645.

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 and are covered by this EPD.

1.3 Product Technical Data

NAME	ASTM TEST METHOD	5/8" RADAR™ CERAMIC ACOUSTICAL PANELS
Noise Reduction Coefficient (NRC)	C423	0.50
Articulation Class (AC)	E1111 and Classification E1110	N/A
Ceiling Attenuation Class (CAC)	E1414 and Classification E413	40
Flame Spread Rating	E84	Class A
Fire Resistance Rating	E119	Fire-rated: FR-4
Light Reflection	E1477	0.82

Table 1: Summary of the technical data

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.

1.5 Delivery Status

The products under consideration are typically delivered in bundles of 12 pieces per carton, surrounded by a cardboard sleeve and wrapped with plastic.

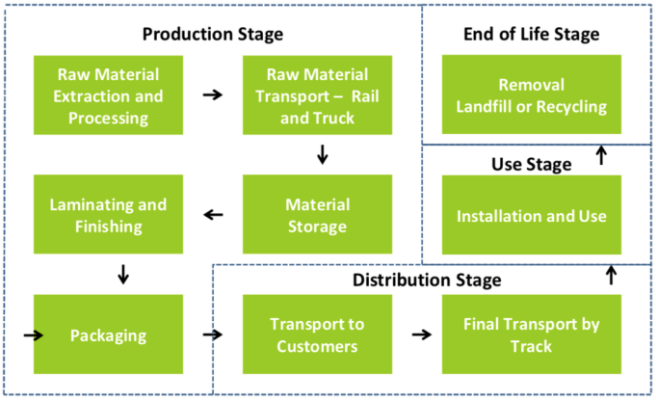
1.6 Product Composition

MATERIAL	5/8" RADAR CERAMIC ACOUSTICAL PANELS
Basemat	91.8%
Coatings	8.2%
Sum	**100.0%**

Table 2: Product specifications and formula

1.7 Product Manufacture

Wet-felted acoustical ceiling panels contain 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. Shrink-wrap and corrugated strip are used as packing materials.



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 to size and painted. Painting may involve two or more coatings with a drying cycle between coatings. After inspection, the ceiling 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. The Cloquet plant produces its own paint coatings and the primary ingredients for these coatings are also included in the analysis.

1.8 Packaging

USG Interiors ceiling panels are packaged using cardboard sleeves and are then wrapped in plastic shrink wrap. USG encourages the proper recycling of these packaging materials. Both the production and disposal of these packaging materials was modeled in this study.

1.9 Environment and Health During Manufacturing

USG has led the building sector's effort in developing and supplying sustainable construction materials. Today, sustainability is integrated into the design and manufacture of wall, ceiling, and flooring products. 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. 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 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.

1.11 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. No material or energy inputs are required on the jobsite. A 7% installation waste factor was included in this study.

1.12 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.

1.13 Environment and Health During Use

This product is not expected to produce any unusual hazards during normal use. Exposure to high dust levels may irritate the skin, eyes, nose, throat, or upper respiratory tract. Proper personal protective gear should be worn by installer for protection. The installed ceiling panel meets the California Department of Public Health CDPH/EHLB/Standard Method Version 1.1, 2010 (Emissions Testing Method for CA Specification 01350) emissions criteria for a high-performance product with respect to harmful VOC emissions.

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

With proper care, ceiling panels may be reused at the end of a building's life.

1.16 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. Final transportation from the building site to waste processing was defaulted to 22 miles (35 km) by truck.

1.17 Extraordinary Effects

Fire

All ceiling product 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). In addition, products listed as Firecode™ meet ASTM E119 (see a USG sales representative for approved fire rated assemblies).

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 Functional Unit

The functional unit for Radar™ Ceramic Acoustical Panels is defined as one square foot (0.093 square meters) of product.

Name	5/8” Radar™ Ceramic Acoustical Panels (Metric)	5/8” Radar™ Ceramic Acoustical Panels (Standard)
Declared Unit	**0.093 m^2**	**1 ft^2**
Declared Thickness	**1.58 cm**	**0.625 in**
Density	**521 kg/m^3**	**32.5 pcf**
Surface weight per declared unit	**8.25 kg/m^2**	**1.69 $lb./ft^2$**

Table 3

2.2 System Boundary

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

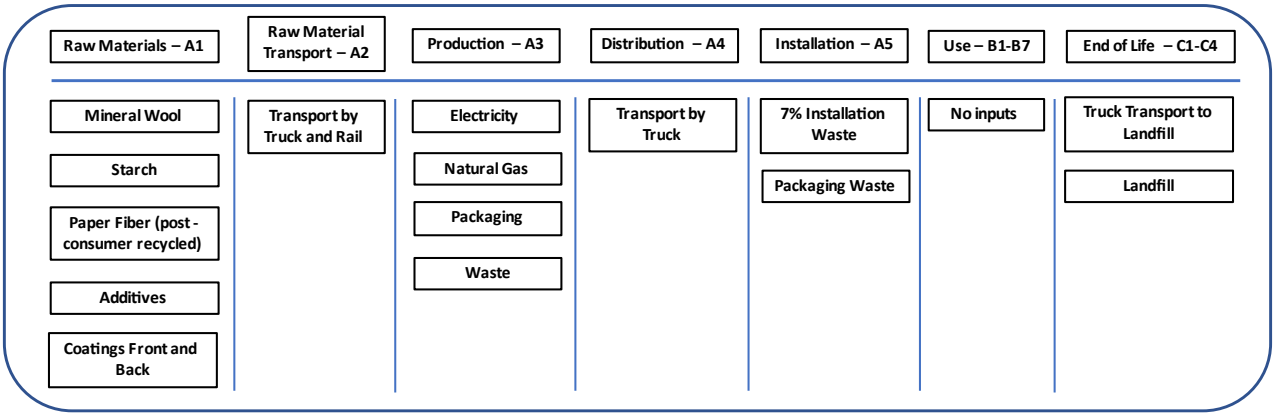


Figure 1: Specific processes covered by this EPD by life cycle stage

2.3 Estimates and Assumptions

In the case of the wet-felted ceiling panel production 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-felted ceiling product raw material and energy inputs are specific to the specific wet-felted 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 for the 2021 calendar 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 from Sphera. 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 calendar year.

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

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

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

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

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

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

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

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

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

2.7 Period Under Review

All raw material and energy inputs are for the 2021 calendar year.

2.8 Allocation

The LCI data was collected for the Cloquet ceiling tile 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

Table 4. Transport to the building site (A4)

Name	Value for 5/8" Radar™ Ceramic Acoustical panels	Unit
Fuel type	Diesel	-
Liters of fuel	1.97E-03	l/100 km
Vehicle type	US Truck	-
Transport distance	800	km
Capacity	0.67	
Gross density of products transported	521	kg/m^3

Table 5. Installation into the building (A5)

Name	Value	Unit
Ancillary materials	0	kg
Net freshwater consumption specified by water source and fate	0	m^3
Other resources	0	kg
Electricity consumption	0	kWh
Other energy carriers	0	MJ
Material loss	7	%
Ceiling Panel Mounting System (CPMS)	~ 180	kg/MSF
Output substances following waste treatment on site	7% of delivered weight	%
Dust in the air	~ 0	kg
VOC content	< 9	µg/m^3

Table 6. Use or application of the installed product (B1)

Name	Value	Unit
RSL	75	years
VOC	< 9	µg/m^3

Table 7. 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^3
Auxiliary	0	kg
Other resources	0	kg
Electricity consumption	0	kWh
Other energy carriers	0	MJ
Material loss	0	kg

Table 8. End of Life (C1-C4)

NAME		VALUE FOR 5/8" RADAR™ CERAMIC ACOUSTICAL PANELS	UNIT
Collection process (specified by type)	Collected separately	0	kg
	Collected with mixed construction waste	0.770	kg
Recovery (specified by type)	Reuse	0	kg
	Recycling	0	kg
	Landfill	0.770	kg
	Incineration	0	kg
	Incineration with energy recovery	0	kg
	Energy conversion efficiency rate	0	-
Disposal	Product or material for final deposition	0.770	kg
Removals of biogenic carbon (excluding packaging)		0.029	kg CO_2

4. 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	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

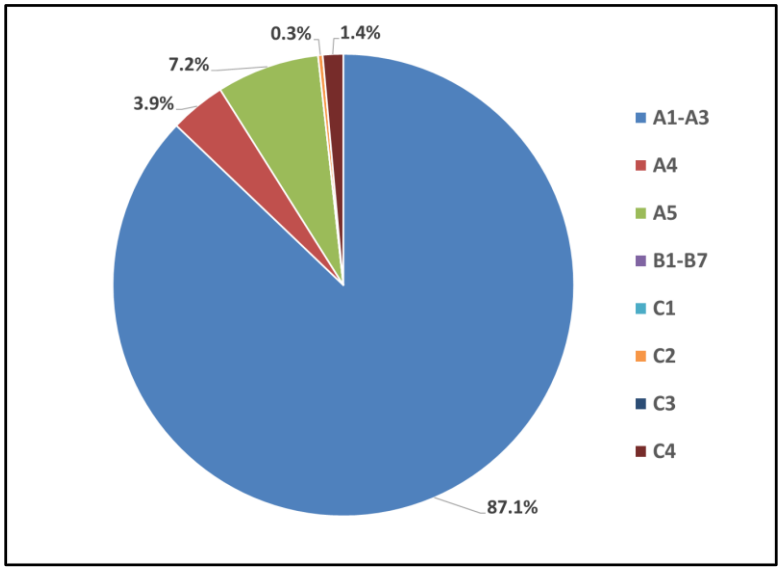
Environmental LCA Results for 1 SF of Cloquet 5/8" Radar™ Ceramic Firecode Ceiling Panels (A1-C4)										
Impact Assessment Method: TRACI 2.1		**A1-A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**Total**
Environmental Impact Category	Units	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Impact
Global warming	kg CO2 eq.	7.15E-01	3.21E-02	5.92E-02	0.00E+00	0.00E+00	2.64E-03	0.00E+00	1.17E-02	8.20E-01
Ozone Depletion Potential (ODP)	kg CFC 11 eq.	4.36E-10	8.35E-17	1.01E-10	0.00E+00	0.00E+00	6.86E-18	0.00E+00	6.86E-18	5.37E-10
Acidification Potential	kg SO2 eq.	1.56E-03	4.54E-05	1.38E-04	0.00E+00	0.00E+00	7.42E-06	0.00E+00	7.56E-05	1.83E-03
Eutrophication Potential (EP)	kg N eq.	1.34E-04	6.57E-06	1.26E-05	0.00E+00	0.00E+00	7.76E-07	0.00E+00	3.34E-06	1.58E-04
Photochemical Ozone Creation Potential (POCP)	kg O3 eq.	2.41E-02	1.02E-03	2.17E-03	0.00E+00	0.00E+00	1.69E-04	0.00E+00	1.44E-03	2.89E-02
Abiotic Depletion Potential (ADP) - fossil fuels	MJ surplus energy	1.59E+00	6.02E-02	1.28E-01	0.00E+00	0.00E+00	4.95E-03	0.00E+00	2.09E-02	1.80E+00

Resource and Waste Flows for 1 SF of Cloquet 5/8" Radar™ Ceramic Firecode Ceiling Panels (A1-C4)											
Use of Primary Resources		**Total A1-A3**	**A4**	**A5**	**B1-B7**	**B6-B7**	**C1**	**C2**	**C3**	**C4**	**Total**
Renewable primary resources used as an energy carrier (RPR-E)	MJ, NCV	4.43E+00	1.81E-02	3.37E-01	0.00E+00	0.00E+00	0.00E+00	1.49E-03	0.00E+00	2.70E-02	4.81E+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	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 (RPR-E)	MJ, NCV	1.36E+01	4.55E-01	1.09E+00	0.00E+00	0.00E+00	0.00E+00	3.74E-02	0.00E+00	1.65E-01	1.54E+01
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Secondary material, secondary fuel and recovered energy		**Total A1-A3**	**A4**	**A5**	**B1-B7**	**B6-B7**	**C1**	**C2**	**C3**	**C4**	**Total**
Secondary Material (SM)	kg	3.69E-01	0.00E+00	2.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.95E-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	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	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	0.00E+00
Consumption of Fresh Water	m3	4.54E-03	6.22E-05	3.50E-04	0.00E+00	0.00E+00	0.00E+00	5.11E-06	0.00E+00	4.16E-05	5.00E-03
Additional inventory parameters for transparency		**Total A1-A3**	**A4**	**A5**	**B1-B7**	**B6-B7**	**C1**	**C2**	**C3**	**C4**	**Total**
Removals and emissions associated with biogenic carbon content of the bio-based product	kg CO2-eq.	-2.88E-02	0.00E+00	-2.03E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.88E-02	-2.03E-03
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	0.00E+00
Removals and emissions associated with biogenic carbon content of the bio-based packaging	kg CO2-eq.	-7.06E-03	0.00E+00	-4.97E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-7.56E-03
Emissions from land use change	kg CO2-eq.	1.33E-04	3.67E-05	1.58E-05	0.00E+00	0.00E+00	0.00E+00	3.02E-06	0.00E+00	3.85E-05	2.27E-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	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	0.00E+00
Indicators describing waste		**Total A1-A3**	**A4**	**A5**	**B1-B7**	**B6-B7**	**C1**	**C2**	**C3**	**C4**	**Total**
Hazardous waste disposed	kg	-1.74E-09	1.31E-12	-1.30E-10	0.00E+00	0.00E+00	0.00E+00	1.08E-13	0.00E+00	3.56E-12	-1.86E-09
Non-hazardous waste disposed	kg	1.05E-01	3.96E-05	7.09E-02	0.00E+00	0.00E+00	0.00E+00	3.26E-06	0.00E+00	8.26E-01	1.00E+00
High-level radioactive waste	kg	5.35E-05	1.30E-06	4.28E-06	0.00E+00	0.00E+00	0.00E+00	1.07E-07	0.00E+00	1.86E-06	6.11E-05
Intermediate and low-level waste	kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Assignments of output flows at the end-of-life		**Total A1-A3**	**A4**	**A5**	**B1-B7**	**B6-B7**	**C1**	**C2**	**C3**	**C4**	**Total**
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	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	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	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	0.00E+00

5. LCA Interpretation

The LCA results for the production of USG Radar™ Ceramic Acoustical 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 Radar™ Ceramic Acoustical Panels



6. References

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

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

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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