

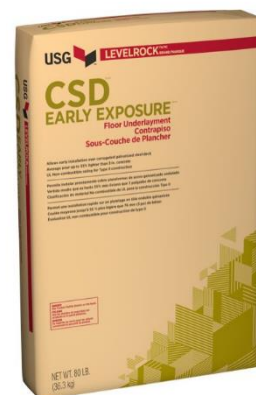
Environmental Product Declaration

Levelrock® Brand CSD® Early Exposure™ Series Floor Underlayment

Fort Dodge, IA and Southard, OK


Premium engineered gypsum cement for early installation over CSD

- Up to 55% lighter than 3 in. of conventional concrete
- Streamlines trade scheduling—can be installed early in the building's construction schedule
- Allows trade traffic to resume the next day (conventional poured concrete requires 7–10 days)
- Applied by USG Levelrock® brand applicators
- UL GREENGUARD Gold Certification; qualifies as a low VOC emitting material (meets CA 01350)



TRACI v2.1 (Environmental Impacts)

Levelrock® Brand CSD® Early Exposure™ Floor Underlayment

Functional Unit – 1 tonne	Southard (A1-A3) Cradle-to-Gate	Fort Dodge (A1-A3) Cradle-to Gate
 Global Warming Potential excl. biogenic carbon (kg CO2 eq.)	3.07E+02	3.27E+02
Global Warming Potential incl. biogenic carbon (kg CO2 eq.)	2.70E+02	2.92E+02
Ozone Depletion Potential (kg CFC-11 eq.)	2.39E-07	1.55E-09
Acidification Potential (kg SO2 eq.)	5.28E-01	5.12E-01
Eutrophication Potential (kg N eq.)	4.79E-02	4.15E-02
Photochemical Ozone Creation Potential (kg O3 eq.)	1.10E+01	1.11E+01
Abiotic Resource Depletion Potential Fossil Fuels (MJ, LHV)	3.47E+02	3.70E+02

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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 866	
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	Levelrock® Brand CSD® Early Exposure™ Series Floor Underlayment	
DATE OF ISSUE	1/8/25	
PERIOD OF VALIDITY	5 Years	
CORE STANDARD	ISO 21930	
CORE PCR	ISO 21930:2017 provided the core rules for construction products and services.	
SUB-CATEGORY PCR	NSF, Product Category Rules for Preparing an Environmental Product Declaration for: Portland Cement, Blended Hydraulic Cement, Masonry and Cement, V3.2, 2021	
SUB-CATEGORY PCR REVIEW	The review process took place from June 2019 through March 2020 and included representatives from manufacturing, trade associations, users, LCA experts, and NSF.	
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

Levelrock® Brand CSD® Early Exposure™ Series Floor Underlayment

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1. Product System Documentation

1.1 Product Description and Product Identification

USG Levelrock® Brand CSD® Early Exposure™ Floor Underlayment is a proprietary engineered gypsum cement designed for interior use in buildings with light-gauge steel frame construction and a corrugated steel deck. USG Levelrock® Brand CSD® Early Exposure™ significantly speeds and streamlines construction trade scheduling, provides high early strength and offers outstanding resistance to incidental moisture. This innovative hybrid cementitious formula can be poured up to 60 days* before installing a building's permanent windows and doors. With a robust compressive strength of 3500-5000 psi (24.1 – 34.5 MPa), USG Levelrock® Brand CSD® Early Exposure™ may be applied at a much lower thickness than poured-in-place concrete.

Typical USG Levelrock® Brand CSD® Early Exposure™ floor underlayments weigh approximately 13 lbs./sq. ft. and require a minimum of 1 in. above the top of the flutes. Pour thickness (as measured from the bottom of the flute) is 1-9/16 in. with a standard 9/16 in. steel deck (minimum 22 gauge). When pouring over USG Levelrock® Brand SAM-CSD™ or USG Levelrock® Brand SAM-N™ Ultra Series Sound Attenuation Mats, it requires a minimum of 1-3/8 in. (35 mm) thick topping of USG Levelrock® Brand CSD® Early Exposure™ and pre-filling the flutes is not necessary.

1.2 Designated Application

- Commercial, light-commercial, residential
- Corrugated steel decks, light-gauge steel framing, concrete slabs, concrete planks, radiant heat systems, USG Levelrock® brand sound attenuation products
- UL fire-rated assemblies with UL Designation Type CSD
- Floor systems with USG Levelrock® brand sound attenuation products
- Use with a variety of floor coverings, including vinyl, carpet, hardwood, and natural and manmade stonestone

1.3 Product Technical Data

Table 1: Performance Data

Technical Data	Approximate Values Standard (Metric)
Safety Data Sheet – Yes/No	Available at usg.com and cgcinc.com
Approximate Compressive Strength (aggregated)	3,500-5,000 psi (24.1-34.5 MPa)
Approximate Dry Density (aggregated)	120 lbs./cu. ft. (1,922 kg/m³)
Approximate Final Set - ASTM C191	60-90 minutes
Surface Burning Characteristics ASTM E84	Flame Spread = 0 Smoke Developed = 0
Packaging	80 lb. (36.3 kg) multiwall paper bags

Note: Results published herein were achieved under controlled laboratory conditions. Actual field results may differ due to environmental conditions, inconsistent proportioning of field-applied water and USG Levelrock® Brand CSD® Early Exposure™ Floor Underlayment, as well as differences in mixing/pumping equipment.

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1.4 Placing on the Market/Application Rules

USG Levelrock® Brand CSD® Early Exposure™ Floor Underlayment is sold to distributors and installed by flooring contractors over wood and concrete subfloors in light-commercial and renovation and construction projects.

1.5 Product Composition

Table 2: Product Composition

Material	USG Levelrock® Brand CSD® Early Exposure™ Floor Underlayment
Cement	99%
Additives	1%
Sum	100%

1.6 Product Manufacturing

The manufacture of USG Levelrock® Brand CSD® Early Exposure™ Floor Underlayment consists of the blending of the dry ingredients followed by packaging into multi-walled paper bags. The finished product is then stacked on wooden pallets and wrapped with a plastic cover bag.

1.7 Environment and Health During Manufacturing

USG and CGC have led the building sector's effort in developing and supplying sustainable construction materials. Today, sustainability is integrated into the design and manufacture of every wall, ceiling, and flooring product. As both a producer and a buyer of raw materials, we have a responsibility to extensively review and select each material we use. Each decision we make is based on careful consideration of environmental and safety effects over time. Raw materials used in our products are carefully selected and go through a screening procedure. Incoming raw materials are tested for contaminants by an internal lab and third-party labs for consideration of use and worker, environmental, and end-user exposure. This due diligence helps to ensure our products are safe to handle in our manufacturing plants and on job sites while having minimal impact on occupant health and indoor and outdoor environments.

1.8 Packaging

USG Levelrock® Brand CSD® Early Exposure™ Floor Underlayment is packaged in 80 lb. multiwall paper bags. The finished product is then stacked on wooden pallets and wrapped with a plastic cover bag. All packaging components have been modeled in this study.

1.9 Conditions of Use

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

1.10 Reference Service Life

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

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2 LCA Calculation Methodology

2.1 Functional Unit

The declared unit for this LCA study is one metric tonne of product.

Table 3: Declared Unit

	Value and Units
Declared Unit	1,000 kg
Declared Unit	2,205 lbs.

3 System Boundary

This EPD represents a “cradle-to-gate” LCA analysis for USG Levelrock® Brand CSD® Early Exposure™ Floor Underlayment. It covers all the production steps from raw material extraction (i.e., the cradle) to finished product on wooden pallets (i.e., the gate).

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



3.1 Estimates and Assumptions

These flooring products are USG products with well-defined formulations, energy inputs and raw material transport distances. No significant assumptions were required, and all minor assumptions were verified by a 3rd party. All material and energy inputs were accounted for as were the raw material transportation mode and distances. Additional data limitations included the use of proxy processes rather than actual supplier generated primary data. This would include such processes as Portland cement, which is representative of US-produced Portland cement but may not necessarily be representative of USG's particular Portland cement supplier. In addition, the data is limited in that the primary data was collected during the 2023 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 impacts assessment methodology, etc.

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3.2 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 1% of energy usage and mass.

3.3 Background Data

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

3.4 Data Requirements and Data Sources

The LCA model was created using LCA for Experts software (version 10.9.0.20) 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 from the manufacturing plants for the 2023 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%) used in production have been modeled. The exception consists of retarders which are biopolymers derived from animal byproducts.

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.

3.5 Allocation

At each production facility, energy was allocated to each department based on usage. The LCI data was collected for the 2023 production year.

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4. LCA: Scenarios and Additional Technical Information

Product Stage			Construction Process stage		Use							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	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Figure 2: System Boundary

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5. Life Cycle Assessment Results

5.1 LCA Results

Table 4: North American LCA Environmental Impacts – 1 Tonne of Levelrock® Brand CSD® Early Exposure™ Series Floor Underlayment (A1-A3) – Southard, OK Plant

Impact Category	Units	A1	A2	A3	A1-A3
Global Warming Potential, excl. biogenic carbon (GWP)	kg CO2 eq.	2.91E+02	5.60E+00	1.00E+01	3.07E+02
Global Warming Potential, incl. biogenic carbon (GWP)	kg CCO2-eq.	2.84E+02	5.59E+00	-1.98E+01	2.70E+02
Ozone Depletion Potential (ODP)	kg CFC 11-eq.	2.39E-07	1.67E-14	1.06E-12	2.39E-07
Acidification Potential (AP)	kg SO2 eq.	4.71E-01	2.51E-02	3.23E-02	5.28E-01
Eutrophication Potential (EP)	kg N eq.	4.03E-02	2.25E-03	5.37E-03	4.79E-02
Photochemical Ozone Creation Potential (POCP)	kg O3-Equiv.	9.28E+00	8.46E-01	8.51E-01	1.10E+01
Abiotic Depletion Potential (ADP) fossil fuels	MJ	3.17E+02	1.07E+01	1.91E+01	3.47E+02

Table 5: North American LCA Environmental Impacts – 1 Tonne of Levelrock® Brand CSD® Early Exposure™ Series Floor Underlayment (A1-A3) – Fort Dodge, IA Plant

Impact Category	Units	A1	A2	A3	A1-A3
Global Warming Potential, excl. biogenic carbon (GWP)	kg CO2 eq.	3.12E+02	5.66E+00	9.43E+00	3.27E+02
Global Warming Potential, incl. biogenic carbon (GWP)	kg CCO2-eq.	3.07E+02	5.67E+00	-2.04E+01	2.92E+02
Ozone Depletion Potential (ODP)	kg CFC 11-eq.	1.55E-09	1.70E-14	1.08E-12	1.55E-09
Acidification Potential (AP)	kg SO2 eq.	4.48E-01	3.45E-02	2.99E-02	5.12E-01
Eutrophication Potential (EP)	kg N eq.	3.35E-02	2.85E-03	5.17E-03	4.15E-02
Photochemical Ozone Creation Potential (POCP)	kg O3-Equiv.	9.12E+00	1.18E+00	7.69E-01	1.11E+01
Abiotic Depletion Potential (ADP) fossil fuels	MJ	3.42E+02	1.08E+01	1.76E+01	3.70E+02

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Table 6: Resource and Waste Flows for 1 Tonne of Levelrock® Brand CSD® Early Exposure™ Series Floor Underlayment

Use of Primary Resources	Units	A1	A2	A3	A1-A3
Renewable primary resources used as an energy carrier (RPRE)	MJ, NCV	2.80E+02	3.32E+00	4.53E+02	7.36E+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
Non-renewable primary resources used as an energy carrier (NRPRE)	MJ, NCV	2.91E+03	7.49E+01	1.67E+02	3.15E+03
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
Secondary material, fuel, and recovered energy	Units	A1	A2	A3	A1-A3
Secondary material (SM)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable secondary fuel (RSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable secondary fuel (NRSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable energy (RE)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Consumption of fresh water	m3	3.82E-01	1.10E-02	5.03E-02	4.43E-01
Emissions inventory parameters for transparency	Units	A1	A2	A3	A1-A3
Biogenic carbon content of product	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Calcination uptake from carbonation	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon of bio-based packaging	kg CO2-eq.	0.00E+00	0.00E+00	-2.00E+01	-2.00E+01
Land use change	kg CO2-eq.	1.06E+00	3.17E-03	5.23E-02	1.11E+00
Combustion of waste from renewable sources used in production	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Combustion of waste from non-renewable sources used in production	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indicators describing waste	Units	A1	A2	A3	A1-A3
Hazardous waste disposed	kg	5.44E-03	1.01E-08	1.36E-06	5.44E-03
Non-hazardous waste disposed	kg	1.67E+01	7.47E-03	3.37E-01	1.70E+01
High-level radioactive waste	kg	2.60E-02	2.26E-04	5.35E-03	3.15E-02
Intermediate and low-level waste	kg	N/A	N/A	N/A	N/A
Assignments of output flows at the end-of-life	Units	A1	A2	A3	A1-A3
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (MR)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Recovered energy exported (EE)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00

(A1-A3) – Southard, OK Plant

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Table 7: Resource and Waste Flows for 1 Tonne of Levelrock® Brand CSD® Early Exposure™ Series Floor Underlayment (A1-A3) – Fort Dodge, IA Plant

Use of Primary Resources	Units	A1	A2	A3	A1-A3
Renewable primary resources used as an energy carrier (RPRE)	MJ, NCV	3.08E+02	3.37E+00	4.54E+02	7.66E+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
Non-renewable primary resources used as an energy carrier (NRPRE)	MJ, NCV	3.18E+03	7.61E+01	1.61E+02	3.41E+03
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
Secondary material, fuel, and recovered energy	Units	A1	A2	A3	A1-A3
Secondary material (SM)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable secondary fuel (RSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable secondary fuel (NRSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable energy (RE)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Consumption of fresh water	m3	3.69E-01	1.12E-02	4.95E-02	4.30E-01
Emissions inventory parameters for transparency	Units	A1	A2	A3	A1-A3
Biogenic carbon content of product	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Calcination uptake from carbonation	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon of bio-based packaging	kg CO2-eq.	0.00E+00	0.00E+00	-2.00E+01	-2.00E+01
Land use change	kg CO2-eq.	3.97E-02	3.22E-03	5.21E-02	9.50E-02
Combustion of waste from renewable sources used in production	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Combustion of waste from non-renewable sources used in production	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indicators describing waste	Units	A1	A2	A3	A1-A3
Hazardous waste disposed	kg	1.23E-06	1.03E-08	1.37E-06	2.61E-06
Non-hazardous waste disposed	kg	1.37E+01	7.59E-03	3.37E-01	1.41E+01
High-level radioactive waste	kg	4.37E-02	2.30E-04	6.09E-03	5.00E-02
Intermediate and low-level waste	kg	N/A	N/A	N/A	N/A
Assignments of output flows at the end-of-life	Units	A1	A2	A3	A1-A3
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (MR)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Recovered energy exported (EE)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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This section presents detailed LCA results to produce one cubic yard of selected USG self-leveling underlayment products on a cradle-to-installation (A1-A5) basis. Additional ingredients consisted of sand and water. A 5% install waste factor was used. This section is included only as “additional information” so that the results for these products can be compared to the results for competitive products, which are presented per cubic yard of ready-to-use product.

Table 8: North American LCA Environmental Impacts – 1 Cubic Yard of Levelrock® Brand CSD® Early Exposure™ Series Underlayment (A1-A5) – Southard, OK Plant

Impact Category	Units	A1-A3	A4	A5	A1-A5
Global Warming Potential, excl. biogenic carbon (GWP)	kg CO2 eq.	2.11E+02	4.91E+01	5.16E+01	3.11E+02
Global Warming Potential, incl. biogenic carbon (GWP)	kg CCO2-eq.	1.85E+02	4.83E+01	5.15E+01	2.85E+02
Ozone Depletion Potential (ODP)	kg CFC 11-eq.	1.65E-07	1.44E-13	6.20E-13	1.65E-07
Acidification Potential (AP)	kg SO2 eq.	3.63E-01	7.19E-02	7.14E-02	5.06E-01
Eutrophication Potential (EP)	kg N eq.	3.29E-02	1.03E-02	5.61E-03	4.88E-02
Photochemical Ozone Creation Potential (POCP)	kg O3-Equiv.	7.53E+00	1.58E+00	2.14E+00	1.13E+01
Abiotic Depletion Potential (ADP) fossil fuels	MJ	2.38E+02	9.21E+01	1.04E+02	4.35E+02

Table 9: North American LCA Environmental Impacts – 1 Cubic Yard of Levelrock® Brand CSD® Early Exposure™ Series Floor Underlayment (A1-A5) – Fort Dodge, IA Plant

Impact Category	Units	A1-A3	A4	A5	A1-A5
Global Warming Potential, excl. biogenic carbon (GWP)	kg CO2 eq.	2.25E+02	4.91E+01	5.16E+01	3.25E+02
Global Warming Potential, incl. biogenic carbon (GWP)	kg CCO2-eq.	2.01E+02	4.83E+01	5.15E+01	3.01E+02
Ozone Depletion Potential (ODP)	kg CFC 11-eq.	1.07E-09	1.44E-13	6.20E-13	1.07E-09
Acidification Potential (AP)	kg SO2 eq.	3.52E-01	7.19E-02	7.14E-02	4.96E-01
Eutrophication Potential (EP)	kg N eq.	2.86E-02	1.03E-02	5.61E-03	4.44E-02
Photochemical Ozone Creation Potential (POCP)	kg O3-Equiv.	7.62E+00	1.58E+00	2.14E+00	1.13E+01
Abiotic Depletion Potential (ADP) fossil fuels	MJ	2.55E+02	9.21E+01	1.04E+02	4.51E+02

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Table 10: Resource and Waste Flows for 1 Cubic Yard of Levelrock® Brand CSD® Early Exposure™ Series Underlayment

Use of Primary Resources	Units	A1-A3	A4	A5	A1-A5
Renewable primary resources used as an energy carrier (RPRE)	MJ, NCV	5.06E+02	2.87E+01	3.03E+01	5.65E+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
Non-renewable primary resources used as an energy carrier (NRPRE)	MJ, NCV	2.16E+03	6.47E+02	7.52E+02	3.56E+03
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
Secondary material, fuel, and recovered energy	Units	A1-A3	A4	A5	A1-A5
Secondary material (SM)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable secondary fuel (RSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable secondary fuel (NRSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable energy (RE)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Consumption of fresh water	m3	3.04E-01	9.52E-02	3.93E-01	7.92E-01
Emissions inventory parameters for transparency	Units	A1-A3	A4	A5	A1-A5
Biogenic carbon content of product	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Calcination uptake from carbonation	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon of bio-based packaging	kg CO2-eq.	0.00E+00	0.00E+00	-1.37E+01	-1.37E+01
Land use change	kg CO2-eq.	7.64E-01	2.74E-02	1.15E-02	8.03E-01
Combustion of waste from renewable sources used in production	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Combustion of waste from non-renewable sources used in production	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indicators describing waste	Units	A1-A3	A4	A5	A1-A5
Hazardous waste disposed	kg	3.74E-03	8.73E-08	4.38E-07	3.74E-03
Non-hazardous waste disposed	kg	1.17E+01	6.45E-02	1.07E+02	1.18E+02
High-level radioactive waste	kg	2.17E-02	1.95E-03	8.75E-03	3.24E-02
Intermediate and low-level waste	kg	N/A	N/A	N/A	N/A
Assignments of output flows at the end-of-life	Units	A1-A3	A4	A5	A1-A5
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (MR)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Recovered energy exported (EE)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00

(A1-A5) – Southard, OK Plant

Levelrock® Brand CSD® Early Exposure™ Series Floor Underlayment

Fort Dodge, IA, and Southard, OK

Table 11: Resource and Waste Flows for 1 Cubic Yard of Levelrock® Brand CSD® Early Exposure™ Series Floor Underlayment (A1-A5) – Fort Dodge, IA Plant

Use of Primary Resources	Units	A1-A3	A4	A5	A1-A5
Renewable primary resources used as an energy carrier (RPRE)	MJ, NCV	5.26E+02	2.87E+01	3.03E+01	5.85E+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
Non-renewable primary resources used as an energy carrier (NRPRE)	MJ, NCV	2.35E+03	6.47E+02	7.52E+02	3.75E+03
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
Secondary material, fuel, and recovered energy	Units	A1-A3	A4	A5	A1-A5
Secondary material (SM)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable secondary fuel (RSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable secondary fuel (NRSF)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable energy (RE)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Consumption of fresh water	m3	2.96E-01	9.52E-02	3.93E-01	7.84E-01
Emissions inventory parameters for transparency	Units	A1-A3	A4	A5	A1-A5
Biogenic carbon content of product	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Calcination uptake from carbonation	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon of bio-based packaging	kg CO2-eq.	0.00E+00	0.00E+00	-1.37E+01	-1.37E+01
Land use change	kg CO2-eq.	6.53E-02	2.74E-02	1.15E-02	1.04E-01
Combustion of waste from renewable sources used in production	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Combustion of waste from non-renewable sources used in production	kg CO2-eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indicators describing waste	Units	A1-A3	A4	A5	A1-A5
Hazardous waste disposed	kg	1.79E-06	8.73E-08	4.38E-07	2.32E-06
Non-hazardous waste disposed	kg	9.66E+00	6.45E-02	1.07E+02	1.16E+02
High-level radioactive waste	kg	3.44E-02	1.95E-03	8.75E-03	4.51E-02
Intermediate and low-level waste	kg	N/A	N/A	N/A	N/A
Assignments of output flows at the end-of-life	Units	A1-A3	A4	A5	A1-A5
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (MR)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Recovered energy exported (EE)	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Levelrock® Brand CSD® Early Exposure™ Series Floor Underlayment

Fort Dodge, IA, and Southard, OK

5.2 LCA Results

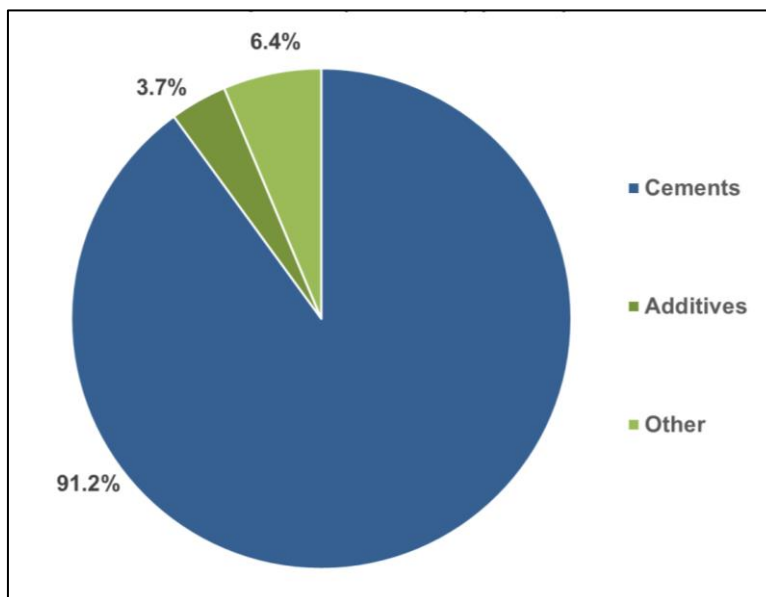
Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building or construction works has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase only when product or construction 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 an erroneous selection of materials or products that have higher impact, at least in some impact categories.

5.3 LCA Interpretation

The LCA results for the production of 1 Tonne of Levelrock® Brand CSD® Early Exposure™ Series Floor Underlayment were dominated by cement usage. Future efforts to reduce the GWP for these products should focus on the formula; specifically the use of high-impact cements.

Figure 3: Process Dominance Analysis for GWP for the Production of 1 Tonne of Levelrock® Brand CSD® Early Exposure™ Series Floor Underlayment (Southard plant)



Levelrock® Brand CSD® Early Exposure™ Series Floor Underlayment

Fort Dodge, IA, and Southard, OK

6. References

LCA Report

A Cradle-to-Gate (A1-A3) Life Cycle Assessment for Selected USG Underlayment Flooring Products, 11/27/24. USG (Confidential)

Product PCR

NSF, Product Category Rules for Preparing an Environmental Product Declaration for: Portland Cement, Blended Hydraulic Cement, Masonry and Cement, V3.2, 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