

ENVIRONMENTAL PRODUCT DECLARATION

USG DRYWALL SUSPENSION SYSTEM

USG INTERIORS, LLC
STOCKTON, CA; WESTLAKE, OH



USG Drywall Suspension System is a hot-dipped galvanized steel, roll-formed suspension system. The USG Drywall Suspension System is roll formed with 15/16" wide face, hot dipped galvanized steel body. The system is generally used to suspend gypsum board in exterior ceilings and in fire-rated and non-fire-rated interior gypsum board ceilings.

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-1222.
- 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.



For over a century, sustainable practices have naturally been an inherent part of business at USG. 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 are the next step toward an even more transparent USG. Contained in this Underwriter's Laboratory certified, ISO compliant EPD is information regarding:

- The Life Cycle Assessment and impact measures including global warming and energy use
- Product performance attributes including fire, seismic, corrosion resistance, and exposure
- Product composition, ingredients, and sources
- Information on the manufacturing process
- Installation and application practices



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According to ISO 14025 &
ISO 21930:2007

USG Drywall Suspension System

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025. 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.



PROGRAM OPERATOR	UL Environment	
DECLARATION HOLDER	USG	
DECLARATION NUMBER	4789615040.106.1.	
DECLARED PRODUCT	USG Drywall Suspension System	
REFERENCE PCR	SCSglobal North American PCR for Designated Steel Construction Products May 5, 2015, v.1.0	
DATE OF ISSUE	July 1, 2020	
PERIOD OF VALIDITY	5 Years	
CONTENTS OF THE DECLARATION	Product definition and information about building physics Information about basic material and the material's origin Description of the product's manufacture Indication of product processing Life cycle assessment results Testing results and verifications	
The PCR review was conducted by:	SCS Global Services	
	Critical PCR review Panel	
	Dr. Thomas Gloria, Ph.D (Chair)	
This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories <input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL		
	Grant R. Martin, UL Environment	
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:		
	Thomas P. Gloria, Industrial Ecology Consultants	

This EPD conforms with ISO 21930:2007

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According to ISO 14025

2.0 Product Information

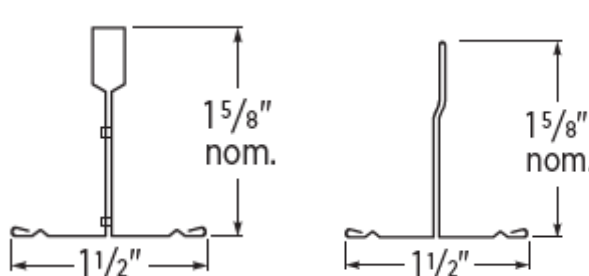


2.1 Product Description

USG Drywall Suspension System (DWSS) is a hot-dipped galvanized steel, roll-formed suspension system roll formed with a 15/16" wide face, hot dipped galvanized steel body. The system is generally used to suspend gypsum board in exterior ceilings and in fire-rated and non-fire-rated interior gypsum board ceilings. It is manufactured by USG in Stockton, CA and Westlake, OH.

This EPD covers the USG Drywall Suspension System used in flat ceiling, curved ceiling and wall-to-wall applications.

2.2 Technical Data

The performance of the USG Drywall Suspension System is listed below.

Items Included in this EPD	Performance Attributes
<p>USG Drywall Suspension System</p> 	 <p>Class A</p>  <p>Qualified for seismic installations</p>



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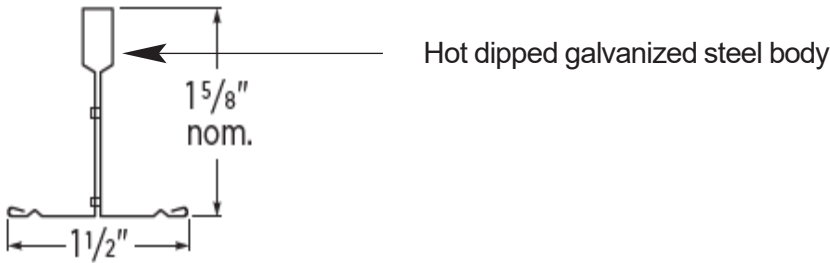
According to ISO 14025

2.3 Placing on the Market/Application Rules

Standard application rules for USG Drywall Suspension System are available on usg.com.

2.4 Product Material Content

The performance of the USG Drywall Suspension System is listed below.



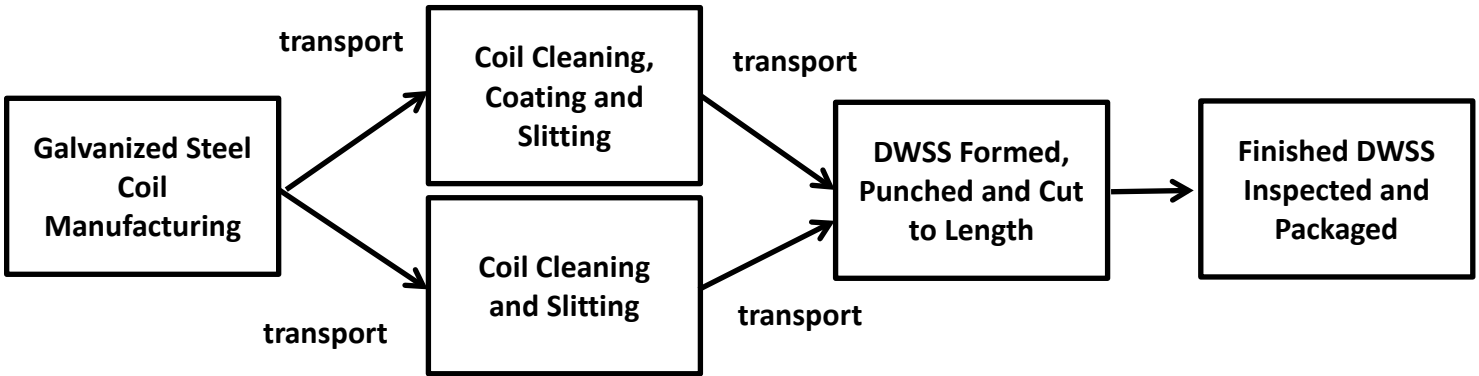
DWSS Component	Function	Quantity (percent by weight)	Recycled Mineral Resource	Non-renewable Resource	Renewable Resource	Abundant Resource	Origin
USG Drywall Suspension System							
Galvanized Steel Coil	Suspension	100%					US Sources





2.5 Product Material Content

DWSS Production System (A1-A3)



During the production 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.

2.6 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 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. All appropriate equipment required by federal, state and local regulations are in place at all USG manufacturing facilities.



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2.7 Packaging

The finished drywall suspension product is packaged in cardboard boxes. Wooden pallets are used to protect unit loads during shipping.

2.8 Product Installation

The USG Drywall Suspension System must be installed according to Install according to ASTM C636, ASTM E580, ASTM C754, CISCA and USG requirements. Alternate installation methods may be used when approved by the authority having jurisdiction. Standard rules and practices for installing and finishing USG drywall suspension products are available online at usg.com.

2.9 Environment and Health during Use Stage

The USG Drywall Suspension System is not a controlled product under WHMIS (Workplace Hazardous Materials Information System).

2.10 Reference Service Life

Per the PCR, the reference service life for this cradle-to-gate (A1-A3) analysis is reported as not specified.

2.11 End-of-Life

This EPD covers life stage modules A1, A2 and A3 and does not cover end of life disposal. In normal practice, most metal DWSS components are recycled at end of life.

2.12 Further Information

Additional information can be found at usg.com



3.0 LCA: Calculation Rules

3.1 Declared or Functional Unit

USG Drywall Suspension System	Value and Units
Declared Unit	1,000 kg of finished, packaged DWSS
Declared Density	7862 kg/m ³

3.2 System Boundary

The system boundaries are cradle to gate (modules A1-A3) and include the following system processes in the production of DWSS: raw material extraction, raw material production, raw material transportation from suppliers to the production facility, product manufacturing and waste management.

3.3 Estimates and Assumptions

All raw material and energy data is specific to the manufacture of USG Drywall Suspension System. No significant issues pertaining to the methods used, assumptions made such as allocation rules, cut-off decisions, selection of impact categories, category indicators and models were identified.

3.4 Criteria for the Exclusion of Inputs and Outputs

The use of criteria for the exclusion of inputs and outputs (i.e., cut off rules) may be used to in situations for which data is not readily available. Cut off rules shall not be used in order to hide data. All hazardous and toxic materials and substances shall be included in the inventory and the cut-off rules do not apply. All use of criteria for exclusion of inputs and outputs shall be documented in the Project Report.

The following steps shall be used for the exclusion of inputs and outputs:

- All inputs and outputs to a unit process shall be included in the LCA calculation for which data are available. Any data gaps may be filled through use of conservative assumptions using representative data. Assumptions used for filling data gaps shall be documented in the Project Report.
- In situations where there is a data gap or insufficient data, criteria for exclusion of inputs and outputs shall be 1% of primary energy usage (including both renewable and non-renewable energy) and 1% on a mass basis for the specific unit process. The maximum criteria for exclusion of inputs and outputs shall be 5% of primary energy usage and mass across all modules included in the LCA.
- Care should be exercised to ensure that material and energy flows which may cause significant emissions to air, water, or soil are included. Use of conservative assumptions and expert judgment may be needed to ensure that this requirement is followed.



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3.5 Data Requirements and Data Sources

Manufacturer specific data was obtained from the USG plants Stockton, CA and Westlake, OH. All results are reported as a mass weighted average across the DWSS manufacturing locations. Steel coil and aluminum coil was purchased at multiple locations in both the US and Asia.

The LCA model for DWSS was created using GaBi software developed by Thinkstep. The GaBi datasets for hot-dipped galvanized steel were the most up-to-date available. The data for these datasets has been collected on site by steel industry experts in accordance with the worldsteel methodology and ISO 14040 standards, and consistency-checked by worldsteel LCA-experts. All transportation associated with raw materials reflects the actual modes of transportation and mileage. The data quality is considered to be good to high quality.

3.6 Allocation

The LCI data was collected for the 2017 production year. No allocations were required in this analysis.

3.7 Comparability of EPDs

Any comparison of EPDs shall be subject to the requirements of ISO 21930. For comparison of EPDs which report different module scopes, such that one EPD includes module D and the other does not, the comparison shall only be made on the basis of Modules A1, A2, and A3. Additionally, when Module D is included in the EPDs being compared, all EPDs must use the same methodology for calculation of Module D values.

Full conformance with the North American Product Category Rule for Designated Steel Construction Products ensures EPD comparability when all stages of a product's life cycle have been duly considered; however, variations and deviations are possible.

4.0 LCA Results

This Environmental Product Declaration (EPD) conforms to ISO 14025, ISO 14040, ISO 14044, and ISO 21930:2007.

Scope of Results Reported: The PCR requires the reporting of a limited set of LCA metrics; therefore, there may be relevant environmental impacts beyond those disclosed by this EPD. The EPD does not indicate that any environmental or social performance benchmarks are met nor thresholds exceeded.

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Accuracy of Results: This EPD has been developed in accordance with the PCR applicable for the identified product following the principles, requirements and guidelines of the ISO 14040, ISO 14044, ISO 14025 and ISO 21930 standards. The results in this EPD are estimations of potential impacts. The accuracy of results in different EPDs may vary as a result of value choices, background data assumptions and quality of data collected.

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. Such comparisons can be inaccurate and could lead to the erroneous selection of materials or products which are higher-impact, at least in some impact categories. Any comparison of EPDs shall be subject to the requirements of ISO 21930. For comparison of EPDs which report different module scopes, such that one EPD includes Module D and the other does not, the comparison shall only be made on the basis of Modules A1, A2, and A3. Additionally when Module D is included in the EPDs being compared, all EPDs must use the same methodology for calculation of Module D values.

Part 1- Description of the system boundary (X: included in LCA; NS- not in scope)															
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
A	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
X	X	X	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

The values presented below represent a volume weighted average for the four production facilities for this product.



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Part 2- Results of the LCA- ENVIRONMENTAL IMPACT: Cradle-to-Gate (A1-A3) for 1 metric ton of USG Drywall suspension System

Traci 2.1 Impact Assessment

Impact Category	Units	A1. Raw Materials	A2. Transport	A3. Production	A1-A3 Total
Global warming potential (GWP)	metric ton CO2 eq.	2.35E+00	6.59E-02	5.52E-02	2.47E+00
Depletion potential of the stratospheric ozone layer (ODP)	metric ton CFC 11 eq.	3.86E-08	2.27E-15	3.93E-12	3.86E-08
Acidification potential of soil and water (AP)	metric ton SO2 eq.	1.11E-02	4.88E-04	5.41E-04	1.22E-02
Eutrophication potential (EP)	metric ton N eq.	4.96E-04	3.64E-05	7.30E-06	5.40E-04
Formation potential of tropospheric ozone (POCP)	metric ton O3 eq.	1.65E-01	1.67E-02	1.43E-03	1.83E-01
Abiotic depletion potential (ADP-elements) for non-fossil resources	metric ton Antimony eq.	8.98E-06	1.21E-08	5.68E-09	9.00E-06
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ, net caloric value	2.70E+04	9.32E+02	5.94E+02	2.86E+04

Part 3- Results of the LCA- RESOURCE USE: Cradle-to-Gate (A1-A3) for 1 metric ton of U SG Drywall suspension Product

Impact Category	Units	A1. Raw Materials	A2. Transport	A3. Production	A1-A3 Total
Use of renewable primary energy excluding renewable primary energy resources used as raw	MJ, net heat content*	9.87E+02	2.32E+01	8.31E+01	1.09E+03
Use of renewable primary energy resources used as raw materials	MJ, net heat content*	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net heat content*	9.87E+02	2.32E+01	8.31E+01	1.09E+03
Use of nonrenewable primary energy excluding nonrenewable primary energy resources used as raw materials	MJ, net heat content*	2.85E+04	9.38E+02	6.40E+02	3.01E+04
Use of nonrenewable primary energy resources used as raw materials	MJ, net heat content*	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of nonrenewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net heat content*	2.85E+04	9.38E+02	6.40E+02	3.01E+04
Use of secondary material	metric tonne	3.53E-01	0.00E+00	0.00E+00	3.53E-01
Use of renewable secondary fuels	MJ, net heat content*	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ, net heat content*	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m ³	1.28E+01	1.13E-01	1.80E-01	1.30E+01

* Net calorific value is applicable to combustible fuels and is not applicable to other forms of renewable energy (e.g., solar, wind).



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Part 4- Results of the LCA- OUTPUT FLOWS and WASTE CATEGORIES: Cradle-to-Gate (A1-A3) for 1 metric ton of USG Drywall Suspension System

Waste:					
Parameter	Units	A1. Raw Materials	A2. Transport	A3. Production	A1-A3 Total
Hazardous waste disposed	metric ton	NA	NA	NA	NA
Non-hazardous waste disposed	metric ton	NA	NA	NA	NA
Radioactive waste disposal	metric ton	NA	NA	NA	NA
Outputs:					
Parameter	Units	A1. Raw Materials	A2. Transport	A3. Production	A1-A3 Total
Components for re-use	metric ton	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials recycling	metric ton	0.00E+00	0.00E+00	1.46E-02	1.46E-02
Materials for energy recovery	metric ton	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported Energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00



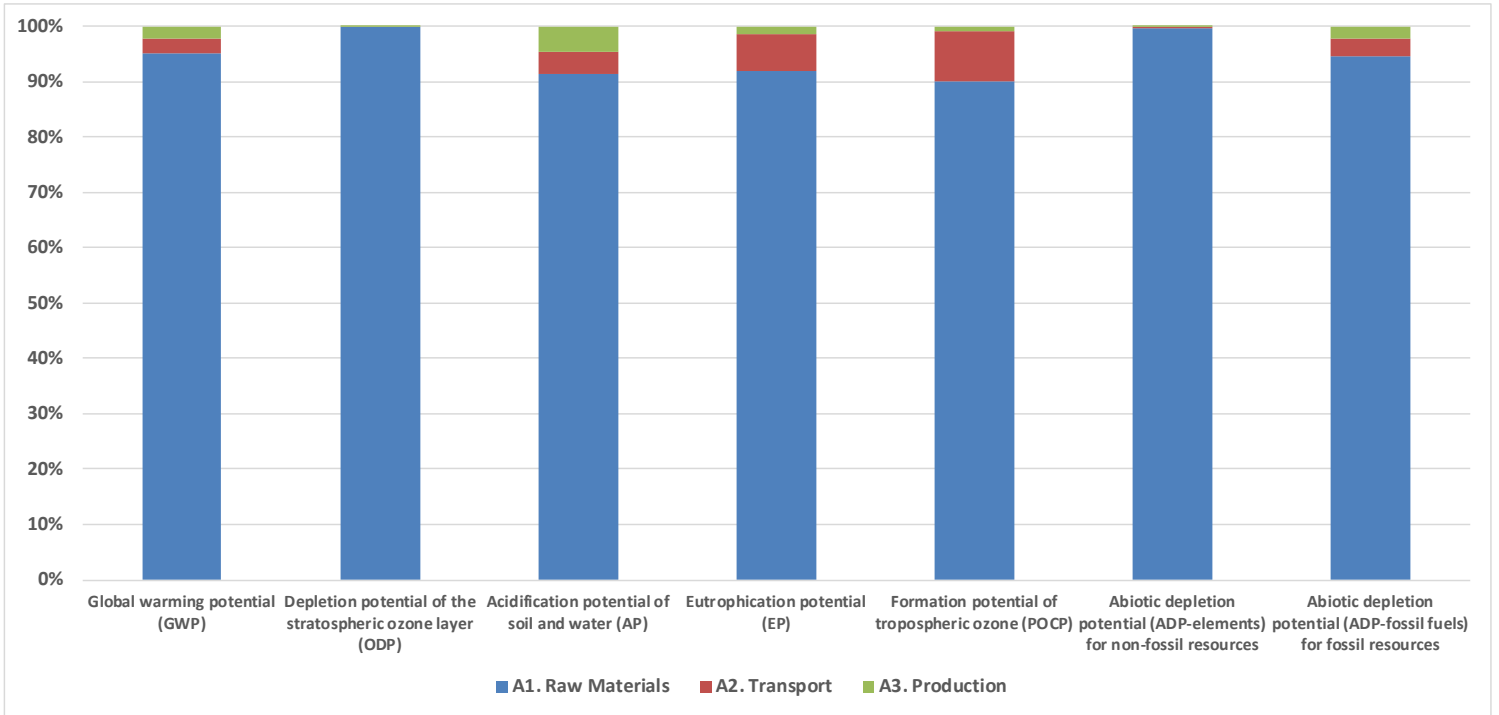


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5.0 LCA Interpretation

The figure below graphically depicts relative contributions for the cradle-to-gate production of 1,000 kg of USG Drywall Suspension System. The significant sources of greenhouse gases at the plant are generated during production of raw materials.





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5.0 LCA Interpretation

1. International Organization for Standardization (ISO), International Standard ISO 14025, Environmental labels and declarations – Type III environmental declaration – Principles and procedures, 2006
2. International Organization for Standardization (ISO), International Standard ISO 14040, Environmental management Life cycle assessment – Principles and framework, 2006.
3. International Organization for Standardization (ISO), International Standard ISO 14044, Environmental management Life cycle assessment – Requirements and guidelines, 2006.
4. International Organization for Standardization (ISO), International Standard ISO 21930, Sustainability in building construction -- Environmental declaration of building products, 2007.
5. European Standards, EN 15804, Sustainability of construction works, Environment product declarations, core rules for the product category of construction products, 2012.
6. PCR for Building-Related Products and Services - Part A: Calculation Rules for the LCA and Requirements Project Report, (IBU/UL E, V1.3, 06.19.2014)
7. North American Product Category Rule for Designated Steel Construction Products by SCS Global Services, May 5, 2015 V.1.0
8. Part B Addendum: IBU PCR for Products of aluminum and aluminum alloys (UL E, V1.1 April 2018)
9. Dr. Mark Englert, "A Cradle-to-Gate Life Cycle Assessment of USG Grid Products", 2018 (Confidential)
10. GENERAL PROGRAMME INSTRUCTIONS FOR THE INTERNATIONAL EPD® SYSTEM, Version 2.01 (2013-09-18), downloadable from:
http://www.environdec.com/Documents/GPI/General_programme_instructions_2_01_20130918.pdf