

ENVIRONMENTAL PRODUCT DECLARATION



DEXCELL FA VSH® GLASS MAT ROOF BOARD (5/8")



ACCORDING TO ISO 14025 AND ISO 21930
Type III environmental product declaration (EPD) developed according to ISO 14025 and 21930 for
DEXcell FA VSH® Glass Mat Roof Board (5/8")



*DEXcell FA VSH® Glass Mat Roof Board is manufactured by Gold Bond Building Products, LLC.
National Gypsum Company is the exclusive service provider for products manufactured by Gold Bond Building Products.*

Program Operator	NSF Certification LLC 789 N. Dixboro, Ann Arbor, MI 48105 www.nsf.org	
Manufacturer Name and Address	Gold Bond Building Products, LLC 2001 Rexford Road Charlotte, NC 28211	
Declaration Number	EPD11039	
Declared Product and Declared Unit	92.9m ² (1,000 square feet) of DEXcell FA VSH® Glass Mat Roof Board (5/8")	
Reference PCR and Version Number	NSF PCR for Gypsum Panel Products (Version 1.1, 2020) This type III EPD is developed according to ISO 14025:2006 and ISO 21930:2017.	
Product's Intended Application and Use	Product is a reinforced gypsum panel with an enhanced moisture-resistant gypsum core and heavy-duty coated glass mat facers.	
Markets of Applicability	North America	
Date of Issue	05/23/2025	
Period of Validity	5 years from date of issue	
EPD Type	Product Specific	
Range of Dataset Variability	N/A	
EPD Scope	Cradle-to-Gate	
Year of reported manufacturer primary data	2022	
LCA Software and Version Number	GaBi 10.0.0.71	
LCI Database and Version Number	GaBi Database 2023.2	
LCIA Methodology and Version Number	TRACI 2.1	
The sub-category PCR review was conducted by:	<ul style="list-style-type: none"> • Thomas P. Gloria, Industrial Ecology Consultants • Bill Stough, Sustainable Research Group • Jack Geibig, EcoForm 	
This declaration was independently verified in accordance with ISO 14025: 2006. The NSF PCR for Gypsum Panel Products (Version 1.1, 2020) serves as the core PCR. <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External	Jack Geibig - EcoForm jgeibig@ecoform.com	
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	Maggie Wildnauer, WAP Sustainability Consulting, LLC	
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Jack Geibig - EcoForm jgeibig@ecoform.com	
Limitations: Environmental declarations from different programs (ISO 14025) may not be comparable. Only EPDs prepared from cradle-to-grave life-cycle results and based on the same function, reference service life, and quantified by the same functional unit, and meeting all the conditions in ISO 14025, Section 6.7.2, can be used to assist purchasers and users in making informed comparisons between products. Full conformance with the PCR for Products allows EPD comparability only 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 results for upstream or downstream of the life cycle stages declared. Additional information on the life cycle assessment can be found by contacting National Gypsum directly .		

DESCRIPTION OF COMPANY

National Gypsum Company is the exclusive service provider of reliable, high-performance building products manufactured by its affiliate companies and marketed under the Gold Bond®, ProForm®, and PermaBASE® brands. The National Gypsum name has been synonymous with high-quality, innovative products and exceptional customer service since 1925.

PRODUCT DESCRIPTION

DEXcell FA VSH® Glass Mat Roof Board is a reinforced gypsum panel with an enhanced moisture-resistant gypsum core and heavy-duty coated glass mat facers. It is an excellent choice for applications requiring maximum hail and puncture resistance. It is extremely durable and is approved for use in single-ply and multi-ply assemblies meeting FM Very Severe Hail (VSH) Classification.

The precoated facers sealed surface technology is designed to increase the coverage of membrane adhesives and enhance the performance of the bond strength of the system. The DEXcell FA VSH Roof Boards help reduce the amount of adhesive used and may eliminate the need for a field primer. Consult the system manufacturer for actual priming requirements.

This mold- and moisture-resistant gypsum panel is a substrate board, thermal barrier and/or coverboard for commercial roofing applications. It scores and cuts easily, and it is specially coated on the front, back and sides for easily handling. Use it in a wide variety of roofing systems, including fully adhered, modified bitumen, fluid applied, spray foam and metal roofs. It also serves as a fire barrier and thermal barrier.

Use DEXcell FA VSH Glass Mat Roof Board as a substrate board and for thermal protection in roofing assemblies. It provides increased fire safety and acoustical enhancement. It also serves as a substrate for a vapor retarder and/or continuous substrate for the application of roofing membranes. This board provides increased moisture, mold, and impact resistance.

Use it as an insulation coverboard in adhered roofing assemblies. DEXcell FA VSH Glass Mat Roof Board protects and supports the roof membrane; provides increased hail resistance, fire, moisture, and mold resistance; and reduces the potential for penetration damage to the membrane. In addition, use it to sheathe the roof side of parapet and penthouse walls.

Product Features:

- Scores and snaps easily.
- Fiberglass mat on face and back has a special coating for easy handling.
- Meets ASTM C1177.
- Meets FM Class 1 and UL Class A fire ratings for roofing systems up to unlimited slope per UL 790/ULC S107.
- Approved component in specific UL fire-rated designs.
- Use it as part of a class A, B or C roof covering that has been tested in accordance UL 1256, ULC CAN-S126, or FM 4450. No additional thermal barrier is required as per IBC 2603.
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.
- Precoated facers seal the surface allowing improved adhesive coverage and bond.

- Eliminates the need for field-applied primer for many fully adhered roofing membrane applications.
- High-density coverboard/thermal barrier.

This EPD includes a representative product manufactured by National Gypsum’s affiliate, Gold Bond Building Products, produced at the facilities shown in the table below. The facility shown below produces DEXcell FA VSH Glass Mat Roof Boards in all thicknesses covered under this study: 5/8”. Each manufacturing input (energy, water, waste, etc.) was utilized based on 2022 production.

Table 1: Manufacturing Facilities

Manufacturing Plants
Medicine Lodge, KS

Gypsum used in the product is sourced from the plants below. This material tends to be sourced from the quarry nearest to the gypsum board manufacturing plant but that is not always the case.

Table 2: Quarries

Quarries
Sun City, KS

The reviewed product is considered a gypsum board product. The CSI code for this product is 07 50 00. The product included in this study falls under the following sub-category as defined by the PCR: gypsum panel products.

APPLICABLE PRODUCT STANDARDS

Applicable product standards for gypsum boards include:

- ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products
- ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- ASTM C1177 Standard Test Method for Glass Mat Gypsum Substrate for Use as Sheathing
- ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
- ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
- ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials
- ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials
- ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C
- ASTM E661 Standard Test Method for Performance of Wood and Wood-Based Floor and Roof Sheathing Under Concentrated Static and Impact Loads
- Gypsum Association, GA-238, Guidelines for Prevention of Mold Growth on Gypsum Board

TECHNICAL DATA

Table 3 shows the technical specifications of the products, including any testing data as appropriate.

Table 3: Technical Details

Parameter	Description
Performance	Roof board, mold- and moisture-resistant, heavy-duty coated fiberglass facers
Mold and Mildew Resistance	The product scored a 10 when tested in accordance with ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
Edge	Square
Thickness	5/8"
Width	48"
Color	Gray
Core	Type X gypsum core
ASTM Standard	ASTM C1177

MANUFACTURING

Gypsum arrives at the manufacturing plant and is ground and heated to remove chemically bound water, forming stucco. The stucco is then mixed with water and other materials to make the core. The core is encased in fiberglass facers. The board is then left to harden, maintaining 20-30% moisture, before being cut and put through a drying process. The edges are then trimmed and panels are stacked on risers before the products are distributed.

MATERIAL COMPOSITION

Unique product compositions were provided for each product and manufacturing site. The average compositions across all manufacturing sites were utilized in the study and are shown in Table 4 below. The raw materials for the product were obtained from various suppliers across North America, in addition to the quarries owned by affiliates of National Gypsum Company. The products under review are packaged with end tape and tear tape before distribution.

Table 4: Material Composition

Material	DEXcell FA VSH Roof Board 5/8"
Gypsum, including internally processed reclaim gypsum	90 - 100%
Fiberglass Mat	0 - 10%
Other Materials	0 - 10%

This study does not include the impacts associated with installation, use, maintenance, repair, operational energy and water use, replacement, refurbishment, and disposal.

This product does not contain substances on the candidate list of SVHC for Authorisation at a percentage higher than 0.1% by mass.

LIFE CYCLE ASSESSMENT BACKGROUND INFORMATION

DECLARED UNIT

The declared unit is 92.9 m² (1,000 square feet) of gypsum board. DEXcell FA VSH® Glass Mat Roof Board can be used as a substrate board, thermal barrier and/or cover board for commercial roofing applications. It is a reinforced gypsum panel with an enhanced moisture- and mold-resistant gypsum core and heavy-duty coated glass mat facers. Use it to provide a variety of roofing systems with maximum hail and puncture resistance.

Table 5: Declared Unit

	DEXcell FA VSH Glass Mat Roof Board 5/8"
Mass per declared unit [kg]	1,750

SYSTEM BOUNDARY

This LCA is a Cradle-to-Gate study. An overview of the system boundary is shown in Figure 1. and a summary of the life cycle stages included in this LCA is presented in Table 6.

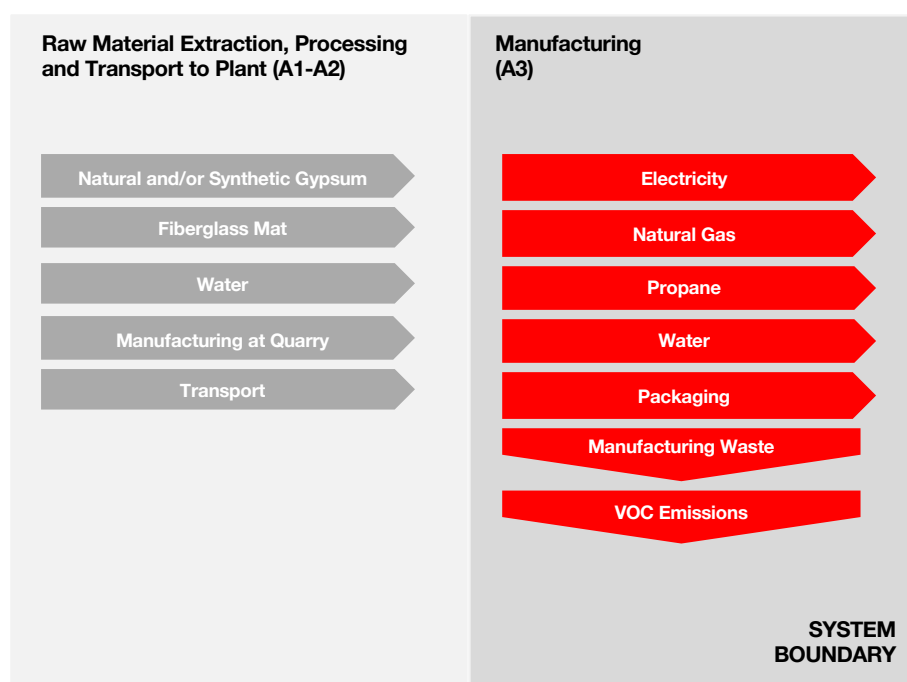


Figure 1: System Boundary

A summary of the life cycle modules included in this EPD is presented in Table 6. Infrastructure flows have been excluded.

Table 6: Life Cycle Stages Included in the Study

Production			Construction		Use							End of Life				Benefits & Loads Beyond System Boundary
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw Material Supply	Transport	Manufacturing	Transport to Site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction	Transport	Waste Processing	Disposal	Reuse, Recovery, Recycling Potential
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

CUT-OFF CRITERIA

Material or energy inputs greater than 1% (based on total mass of the final product) were included within the scope of the analysis. Material and energy inputs less than 1% were included if sufficient data were available to warrant inclusion and/or the material input was thought to have significant environmental impact. Cumulative excluded material and energy inputs and environmental impacts are less than 5% based on total weight of the declared unit. No known flows were deliberately excluded from this EPD.

ALLOCATION

General principles of allocation were based on ISO 14040/44.

To derive a per-unit value for the manufacturing inputs/outputs, mass allocation based on total production at each manufacturing facility was adopted. For all plants that make the reviewed product, the total consumption during 2022 was divided by the total production mass during 2022 to derive a weighted-average use-per-production unit value. Gold Bond Building Products' associates determined the best way to allocate inputs. This allocation methodology was used for the following inputs:

- Electricity
- Diesel
- Gasoline
- Thermal Energy from Natural Gas
- Propane
- Water
- Waste

Discussions with Gold Bond Building Products' staff revealed this was a representative way to allocate the manufacturing inputs/outputs due to the fact that all products created at the facilities are similar in nature. As a default, secondary GaBi datasets use a physical mass basis for allocation.

LIFE CYCLE ASSESSMENT RESULTS

All results are given per declared unit, which is 92.9 m² (1,000 square feet) of gypsum board. Environmental impacts were calculated using the GaBi software platform. Impact results have been calculated using the TRACI 2.1 impact assessment methodology. Results presented in this report are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

Table 7: LCIA Indicators

Abbreviation	Parameter	Unit
TRACI 2.1		
AP	Acidification potential of soil and water	kg SO ₂ eq
EP	Eutrophication potential	kg N eq
GWP, incl biogenic carbon	Global warming potential (100 years, includes biogenic CO ₂)	kg CO ₂ eq
GWP, excl biogenic carbon	Global warming potential (100 years, includes biogenic CO ₂)	kg CO ₂ eq
ODP	Depletion of stratospheric ozone layer	kg CFC 11 eq
ADP_{fossil}	Depletion of non-renewable fossil fuels	MJ, surplus energy
SFP	Smog formation potential	kg O ₃ eq

Table 8: Biogenic Carbon Indicators

Abbreviation	Parameter	Unit
BCRP	Biogenic Carbon Removal from Product	[kg CO ₂]
BCEP	Biogenic Carbon Emission from Product	[kg CO ₂]
BCRK	Biogenic Carbon Removal from Packaging	[kg CO ₂]
BCEK	Biogenic Carbon Emission from Packaging	[kg CO ₂]
BCEW	Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	[kg CO ₂]
CCE	Calcination Carbon Emissions	[kg CO ₂]
CCR	Carbonation Carbon Removals	[kg CO ₂]
CWNR	Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes	[kg CO ₂]

Table 9: Resource Use, Waste, and Output Flow Indicators

Abbreviation	Parameter	Unit
Resource Use Parameters		
RPR_E	Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value (LHV)
RPR_M	Use of renewable primary energy resources used as raw materials	MJ, net calorific value
RPR_T	Total use of renewable primary energy resources	MJ, net calorific value
NRPR_E	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value
NRPR_M	Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value
NRPR_T	Total use of non-renewable primary energy resources	MJ, net calorific value

Abbreviation	Parameter	Unit
SM	Use of secondary materials	kg
RSF	Use of renewable secondary fuels	MJ, net calorific value
NRSF	Use of non-renewable secondary fuels	MJ, net calorific value
RE	Recovered energy	MJ, net calorific value
FW	Net use of fresh water	m ³
Waste Parameters and Output Flows		
HWD	Disposed-of-hazardous waste	kg
NHWD	Disposed-of non-hazardous waste	kg
HLRW	High-level radioactive waste, conditioned, to final repository	kg
ILLRW	Intermediate- and low-level radioactive waste, conditioned, to final repository	kg
CRU	Components for reuse	kg
MR	Materials for recycling	kg
MER	Materials for energy recovery	kg
EEE	Exported electrical energy	MJ
EET	Exported thermal energy	MJ

The user of the EPD should take care when comparing EPDs from different companies. Assumptions, data sources, and assessment tools may all impact the variability of the final results and make comparisons misleading. Without understanding the specific variability, the user is therefore, not encouraged to compare EPDs.

DEXCELL FA VSH® GLASS MAT ROOF BOARD (5/8")

The LCIA results presented below are for 92.9 m² (1,000 square feet) of gypsum board.

Impact Category	Total A1-A3	A1	A2	A3
TRACI LCIA Impacts (North America)				
AP [kg SO ₂ eq]	0.465	0.209	0.063	0.193
EP [kg N eq]	0.0719	0.0168	0.0061	0.0490
GWP, incl biogenic carbon [kg CO ₂ eq]	334	60.4	17.4	256
GWP, excl biogenic carbon [kg CO ₂ eq]	329	60.3	17.5	252
ODP [kg CFC 11 eq]	1.14x10 ⁻⁶	1.14x10 ⁻⁶	5.21x10 ⁻¹⁴	4.88x10 ⁻¹³
ADP-fossil fuel [MJ]	4570	977	231	3360
SFP [kg O ₃ eq]	9.07	4.62	1.43	3.01
Carbon Emissions and Uptake				
BCRP [kg CO ₂]	-	-	-	-
BCEP [kg CO ₂]	-	-	-	-
BCRK [kg CO ₂]	-	-	-	-
BCEK [kg CO ₂]	-	-	-	-
BCEW [kg CO ₂]	-	-	-	-
CCE [kg CO ₂]	-	-	-	-
CCR [kg CO ₂]	-	-	-	-
CWNR [kg CO ₂]	-	-	-	-

Impact Category	Total A1-A3	A1	A2	A3
Resource Use Indicators				
RPR _E [MJ]	463	221	10	232
RPR _M [MJ]	-	-	-	-
RPR _T [MJ]	463	221	10	232
NRPR _E [MJ]	4720	1030	233	3460
NRPR _M [MJ]	-	-	-	-
NRPR _T [MJ]	4720	1030	233	3460
SM [kg]	-	-	-	-
RSF [MJ]	-	-	-	-
NRSF [MJ]	-	-	-	-
RE [MJ]	-	-	-	-
FW [m ³]	0.592	0.443	0.034	0.116
Output Flows and Waste Categories				
HWD [kg]	1.19x10 ⁻⁵	1.05x10 ⁻⁵	3.15x10 ⁻⁸	1.37x10 ⁻⁶
NHWD [kg]	43.6	4.33	0.0233	39.2
HLRW [kg]	6.68x10 ⁻⁵	2.31x10 ⁻⁵	8.34 x10 ⁻⁷	4.29x10 ⁻⁵
ILLRW [kg]	0.0544	0.0178	0.00070	0.0359
CRU [kg]	-	-	-	-
MR [kg]	-	-	-	-
MER [kg]	-	-	-	-
EEE [MJ]	5.23	-	-	5.23

Impact Category	Total A1-A3	A1	A2	A3
EET [MJ]	2.46	-	-	2.46

LIFE CYCLE ASSESSMENT INTERPRETATION

A dominance analysis was performed for all products in the LCA to show which of the life cycle modules contributes to the majority of the impacts. Due to the relevance of this impact category to the product type and the manufacturer's interests, this dominance analysis is provided for TRACI 2.1 Global Warming Potential (GWP) 100, excluding biogenic carbon results.

Global warming potential (GWP) is a measure of how much heat a greenhouse gas traps in the atmosphere up to a specified time horizon and measured relative to carbon dioxide.

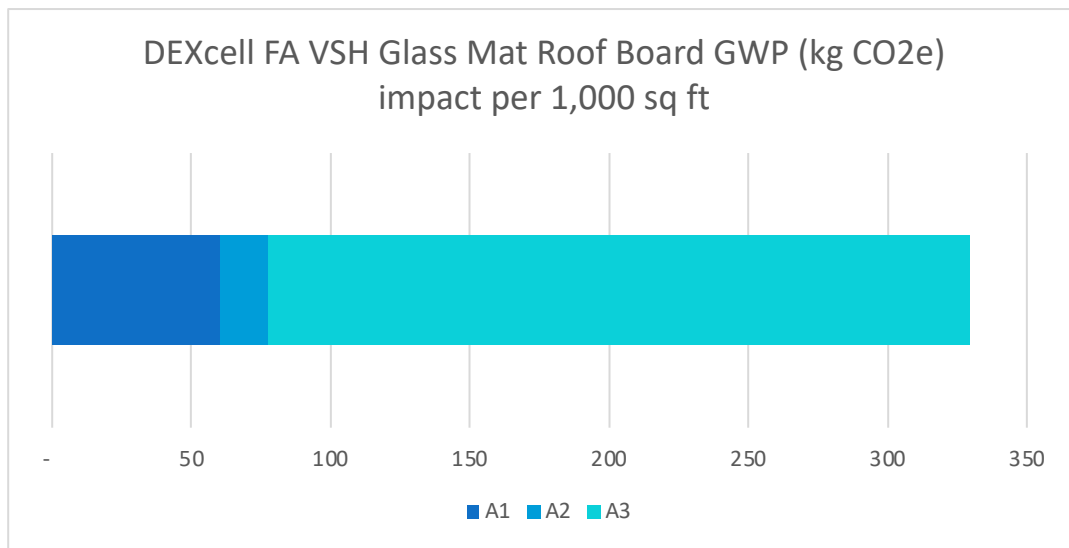


Figure 2: GWP dominance analysis for DEXcell FA VSH® Glass Mat Roof Board (5/8" thick panel)

The dominance analysis shows that the impacts from manufacturing (A3) represent the large majority of the GWP at 77%. Raw material extraction (A1) and transportation (A2) are much lower at 18% and 5%, respectively. The emissions sources contributing the most within the manufacturing stage (A3) are natural gas and electricity usage.

Some limitations to the study have been identified as follows:

- Only facility-level data were provided for manufacturing processes. Sub-metering of specific product lines would allow for more accurate manufacturing impacts to be modeled.
- Availability of geographically more accurate datasets would have improved the accuracy of the study.
- Since this LCA uses the cut-off approach to model recycled material in the product, no credit is given to the product system. Instead, the manufacturer realizes reduced environmental impacts through the absence of the burden of extracting virgin material.
- Only known and quantifiable environmental impacts are considered.

- Due to the assumptions and value choices listed above, these do not reflect real-life scenarios and hence they cannot assess actual and exact impacts, but only potential environmental impacts.

ADDITIONAL ENVIRONMENTAL INFORMATION

ENVIRONMENTAL ACTIVITIES AND CERTIFICATIONS

DEXcell FA VSH® Glass Mat Roof Board (5/8") has a published [Health Product Declaration](#).

Gypsum boards, if installed and treated properly, will last the lifetime of the building.

REFERENCES

1. Life Cycle Assessment, LCA Report for National Gypsum – Gypsum Boards. WAP Sustainability Consulting. July 2024.
2. NSF Product Category Rule (PCR) for Gypsum Panel Products Version 1.1 (April 2020)
3. ISO 14044: 2006 Environmental Management – Life cycle assessment – Requirements and Guidelines.
4. ISO 14044: 2006/ Amd 1:2017 Environmental Management – Life cycle assessment – Requirements and Guidelines – Amendment 1.
5. ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and Procedures.
6. ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services.