ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025:2006 AND ISO 21930:2017

SmartEPD-2026-153-1032-01.1

High and Ultra High Density SFRM (Z-146, Z-146PC, Z-146T, Z-156, Z-156PC, Z-156T)



gcp SAINT-GOBAIN

SMART EPD ENVIRONMENTAL PRODUCT DECLARATION

Date of Issue:	Expiration:	Last updated:
Aug 18, 2026	Aug 18, 2031	Nov 02, 2026

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General Information



GCP/Saint-Gobain

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Product Name:	High and Ultra High Density SFRM (Z-146, Z-146PC, Z-146T, Z-156, Z-156PC, Z-156T)
Declared Unit:	1 metric ton
Declaration Number:	SmartEPD-2026-153-1032-01.1
Date of Issue:	August 18, 2026
Expiration:	August 18, 2031
Last updated:	November 02, 2026
EPD Scope:	Cradle to gate with other options A1 – A3, specify other options
Market(s) of Applicability:	North America

General Organization Information

GCP is a leading global provider of specialty building materials dedicated to safeguarding structures and vital infrastructure from water, weather, fire, and more. Trusted by owners, architects, engineers, designers, and contractors, GCP delivers cutting-edge solutions to tackle the most complex construction challenges of today and the future. The company has a rich history of first to market innovations and award-winning products that have been used to build many of the world's most iconic structures. Proudly part of Saint-Gobain, GCP is deeply committed to its customers, sustainability, and the mission of "Making the World a Better Home."

Further information can be found at: www.gcpat.com.

Limitations, Liability and Ownership

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 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 results for upstream or downstream of the life cycle stages declared. The EPD owner has sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

The selection of a cradle-to-gate system boundary is consistent with prevailing practice within the SFRM (UN CPC 54650) EPD landscape and aligns with the applicable PCR requirements.

Reference Standards

Standard(s):	ISO 14025:2006 and ISO 21930:2017
Core PCR:	Smart EPD® Part A Product Category Rules for Building and Construction Products and Services, 1000 v1.2 Date of issue: March 14, 2025
Sub-category PCR:	Smart EPD® Part B PCR for Spray-Applied Fire-Resistive Materials, 1000-003 v4.0 Date of issue: January 16, 2025 Valid until: January 16, 2030
Sub-category PCR review panel:	Contact Smart EPD for more information.
General Program Instructions:	Smart EPD General Program Instructions v.2.0, March 2025

Verification Information

LCA Author/Creator:	Saint-Gobain North American ESG Sustainability Group sustainability@saint-gobain.com
EPD Program Operator:	Smart EPD info@smartepd.com www.smartepd.com 585 Grove St., Ste. 145, Herndon, VA 20170, USA
Verification:	Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071: External Alison Lee | Independent Contractor | alisonleeconroy@gmail.com Independent external verification of EPD, according to ISO 14025 and reference PCR(s): External Alison Lee | Independent Contractor | alisonleeconroy@gmail.com

Product Information

Declared Unit:	1 metric ton
Mass:	1000 kg
Product Specificity:	✓ Product Average ✗ Product Specific

Product Description

Spray-Applied Fire-Resistive Materials (SFRM) (UN CPC 54650) are composed primarily of binding agents such as cement or gypsum and may incorporate supplementary materials including quartz, bauxite, and other additives. These additional components are used to reduce density and enhance insulating properties by introducing entrained air. Chemical hardeners may also be included to accelerate curing or to improve the mechanical strength of the final product.

Passive fire protection materials (commonly referred to as fireproofing) are designed to prevent or delay the structural failure of steel and concrete elements when exposed to fire. These materials function by insulating structural members, thereby slowing heat transfer and preserving structural integrity for a defined period. A variety of fireproofing materials are available depending on the application requirements. Applied fireproofing systems are typically available in both wet-mix and dry-mix formulations and are most commonly spray-applied, although trowel application is also used in certain cases.

SFRM products are generally supplied as dry powder in bags and mixed with water at the point of application. Modern formulations are asbestos-free and do not contain intentionally added free crystalline silica, aligning with current health and safety standards. This Environmental Product Declaration (EPD) specifically covers standard-density SFRM products.

This report serves as the basis for a company-specific EPD representing a range of SFRM products manufactured at three GCP Applied Technologies facilities in North America, produced in accordance with varying product specifications.

Product Specifications

Product Classification Codes: UNCPC - 54650

EC3 - Finishes

Material Composition

Material/Component Category	Origin	% Mass
Bauxite	Confidential	45-55
Portland Limestone Cement	Confidential	35-45
Clay	Confidential	3-6
Rest- additives	Confidential	2-4
Recovered paper	Confidential	1-3

Packaging Material	Origin	kg Mass
Pallets	Confidential	7.3
Stretch Film	Confidential	0.01
Paper Sacks	Confidential	0.57

Biogenic Carbon Content	kg C per metric ton
Biogenic carbon content in product	0.02
Biogenic carbon content in accompanying packaging	4.47

Hazardous Materials
No substances required to be reported as hazardous are associated with the production of this product

EPD Data Specificity

Primary Data Year: 2024

Manufacturing Specificity:

- ✗ Industry Average
- ✓ Manufacturer Average
- ✗ Facility Specific

Averaging:

The average EPD was developed using a plant level, production weighted approach for SFRM standard density products. Input data (raw materials, energy, emissions, and outputs) were collected across the full range of representative products such as Z-146 and related variants and then aggregated and normalized based on production volumes to create a single, representative dataset. This averaged inventory was modeled in the LCA to generate results that reflect the overall environmental performance of the product group, rather than any individual formulation, in accordance with EPD guidance for product group reporting.

System Boundary

Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	ND
	A5	Assembly / Install	ND
Use	B1	Use	ND
	B2	Maintenance	ND
	B3	Repair	ND
	B4	Replacement	ND
	B5	Refurbishment	ND
	B6	Operational Energy Use	ND
	B7	Operational Water Use	ND

End of Life	C1	Deconstruction	ND
	C2	Transport	ND
	C3	Waste Processing	ND
	C4	Disposal	ND
Benefits & Loads Beyond System Boundary	D	Recycling, Reuse Recovery Potential	ND

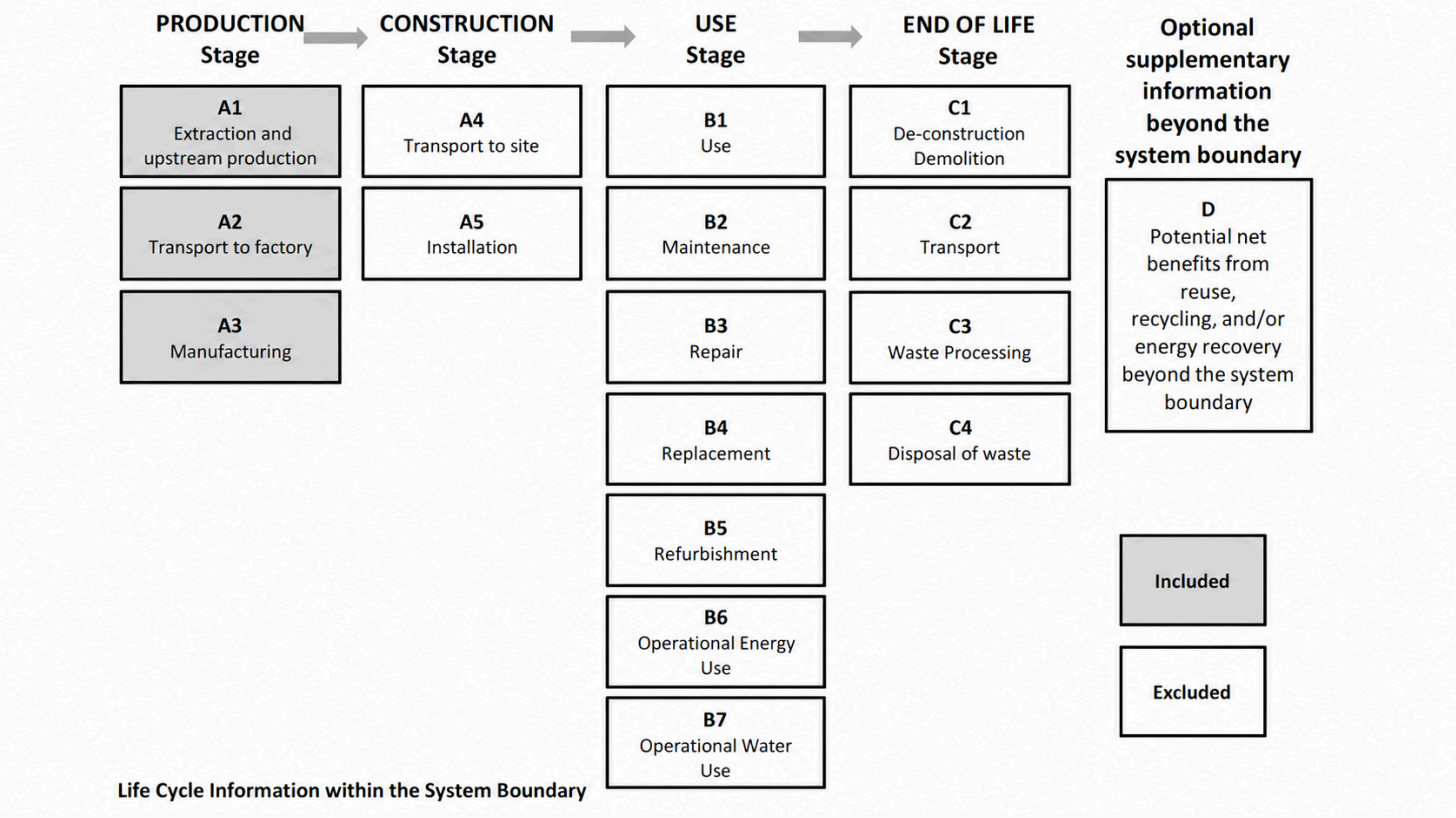
Note:

ND = Module not declared

Plants

Santa Ana 2500 South Garnsey Street, Santa Ana, CA, USA
Ajax 294 Clements Rd W, Ajax, ON, Canada

Product Flow Diagram



Software And Database

LCA Software:	Sphera LCA for Experts (formerly GaBi) v. 10.9
LCI Foreground Database(s):	GaBi Professional Database v. 2025.1
LCI Background Database(s):	Ecoinvent v. 3.12 | US LCI v. 1.2024-06.0

A foreground LCI database is the database used to model the primary, site-specific data collected for this EPD. A background LCI database is the database used to model generic or non-specific data.

Data Quality

This life cycle assessment was conducted in accordance with ISO 14040/44 and EN 15804. Data quality was evaluated based on precision, completeness, consistency, representativeness, and reproducibility, recognizing that LCA results depend on the quality of both primary and secondary data.

Primary Data
Primary data were collected directly from CertainTeed manufacturing facilities and represent site-specific operations for the defined reference period. All primary data are quantified and based on measured or calculated values obtained from automated tracking systems, production records, and utility meters. These data include energy and water consumption, production volumes, and operational inputs and outputs relevant to Modules A1–A3. Primary data are reported annually and are representative of normal operating conditions. Allocation of energy and material flows was performed using production-based methods validated by facility experts. Although statistical uncertainty was not quantified, the primary data are considered to have high precision and low uncertainty due to direct measurement and internal verification.

Secondary Data
Secondary data were used for upstream and downstream processes, including raw material extraction and processing, transportation, and energy production. Datasets were primarily sourced from the Sphera LCA FE database, with supplementary data from USLCI and ecoinvent v3.11 where necessary. Proxy datasets were used only when no suitable data were available. Secondary datasets are representative of North American conditions, average technologies, and recent timeframes, with most data less than ten years old. Any deviations from data quality requirements are documented and justified. As typical in LCA studies, secondary data are associated with higher uncertainty than site-specific primary data and were considered accordingly during result interpretation.

Life Cycle Module Description

This LCA study is characterized as a “cradle to gate, examining the Spray-applied Fire-Resistive Material (SFRM) Standard Density- High and Ultra High Density product lines from raw material extraction through to Manufacturing including packaging. For this life cycle assessment, the Saint-Gobain North America (SGNA) ESG department, with assistance from personnel at the manufacturing locations, collected specific data on energy and material inputs, wastes, water usage, emissions, and transportation impacts for the calendar year 2024. The **Production stage** (modules A1 to A3) includes the following processes:

A1 Extraction and upstream production: Extraction and processing of input raw materials used in the production of high & ultra-high-density SFRMs, including fuels used in extraction and transport within the process.

A2 Transportation to factory: Transportation of input raw materials (including recovered materials) from extraction site or source to manufacturing facilities, including empty backhauls.

A3 Manufacturing: Manufacturing of the SFRMs, including all on-site energy and ancillary materials required and emissions to air, water and land and wastes produced. This also includes transportation from manufacturing site to landfill for on-site wastes, including empty backhauls and the waste disposal

process. The A3 module includes grinding, mixing, blending, pneumatic conveying, high-speed auger packaging, lighting and heating, ventilation and air conditioning, operation of environmental equipment (baghouses and bin vents), on-site transportation (loading and unloading) and storage of SFRMs.

The **Product Stage** excludes the following processes :

- Production, manufacture, and construction of manufacturing capital goods and infrastructure;
- Production and manufacture of production equipment, delivery vehicles, and laboratory equipment;
- Personnel-related activities (travel, furniture, and office supplies); and
- Energy and water use related to company management and sales activities that may be located either within the factory site or at another location.

LCA Discussion

Allocation Procedure

Allocation was performed at the product level within each manufacturing facility. In the absence of sub-metering by individual product line, shared resource flows including electricity, fuels (natural gas and propane), water, packaging materials, and associated process emissions were allocated based on each product's proportion of total annual production mass at the facility.

Mass was selected as the most appropriate and practicable allocation parameter, as it is directly measured, consistently recorded, and reasonably representative of resource consumption across products. Accordingly, mass-based allocation was applied to quantify input energy flows, packaging materials, and waste outputs per declared unit of 1,000 kg of SFRM. This approach is consistent with ISO 14044 and EN 15804 requirements where more specific allocation relationships are not available. Life Cycle Inventory (LCI) modeling further incorporates plant-specific production yields in accordance with ISO 14044, Section 4.3.4.2.

Each manufacturing facility was modeled independently using site-specific data; therefore, no allocation was performed across facilities. The manufacturing process does not generate co-products or by-products, and all waste streams are treated as residual waste, eliminating the need for co-product allocation.

Secondary inputs, including hammermilled newsprint and post-industrial polystyrene, are classified as recovered materials. In accordance with cut-off methodology principles, only the environmental burdens associated with reprocessing, handling, sorting, and transportation from the generating industrial process to their point of use are included in the system boundary. Upstream burdens prior to recovery are attributed to the original product system. Transportation impacts were allocated based on the mass of materials transported.

Cut-off criteria were applied in accordance with ISO 21930. All relevant input and output flows were included in the LCI modeling. No substances of high concern for human health or the environment were identified within the scope of this EPD. Minor data gaps for the reference year 2024 (e.g., packaging materials) were addressed using representative plant-average data from prior years, ensuring completeness and consistency of the dataset.

Cut-off Procedure

Cut-off criteria were applied in accordance with ISO 21930. Processes contributing less than 1% of mass and environmental impact per category may be excluded, provided that the total of all excluded processes does not exceed 5%. However, in this study, no known input or output flows were deliberately excluded. All available and relevant data reported by the two manufacturing facilities were included in the LCI modeling. Capital goods (e.g., buildings, machinery, and infrastructure) were not included, consistent with standard LCA practice and PCR requirements. For hazardous substances, as defined under the U.S. Occupational Safety and Health Act (OSHA), the following provisions apply:

- LCI data for hazardous substances were included where available.

- If specific LCI data were not available, the substance was reported as an input where it exceeded 0.1% of the product composition.
- Where proxy datasets were used to approximate hazardous substances, these assumptions were documented.

This EPD is in compliance with all applicable cut-off criteria, and no material flows known to significantly affect the results have been omitted.

Renewable Electricity

Energy Attribute Certificates (EACs) such as Renewable Energy Certificates (RECs) or Power Purchase Agreements (PPAs) are included in the baseline reported results: ✕ No

Results

Environmental Impact Assessment Results

IPCC AR6 GWP 100, TRACI 2.2, CML 2016 v4.8

per 1 metric ton of product.

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

Impact Category	Unit	Method	A1 - A3
GWP-total (excl biogenic)	kg CO2 eq	IPCC AR6 GWP 100	5.54e+2
GWP-total (incl biogenic)	kg CO2 eq	IPCC AR6 GWP 100	5.37e+2
GWP-total (excl biogenic)	kg CO2 eq	TRACI 2.2	5.51e+2
GWP-total (incl biogenic)	kg CO2 eq	TRACI 2.2	5.35e+2
ODP	kg CFC 11 eq	TRACI 2.2	9.56e-7
AP	kg SO2 eq	TRACI 2.2	2.18e+0
EP-freshwater	kg P eq	TRACI 2.2	1.19e-2
EP-marine	kg N eq	TRACI 2.2	1.53e+0
POCP	kg O3 eq	TRACI 2.2	5.60e+1
ADP-fossil	MJ	CML 2016 v4.8	5.89e+2

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particular Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.

Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product 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 comparison can be inaccurate, and could lead to erroneous selection of materials or products which are higher-impact, at least in some impact categories.

Resource Use Indicator

per 1 metric ton of product.

Indicator	Unit	A1 - A3
RPRE	MJ	7.24e+2
RPRM	MJ	0
RPRT	MJ	7.24e+2
NRPRE	MJ	5.15e+3
NRPRM	MJ	0
NRPRT	MJ	3.51e+3
SM	kg	1.99e+1
RSF	MJ	0
NRSF	MJ	0
FW	m3	8.10e-1

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRT or PENRT = Total non-renewable primary resources with energy content, SM = Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

Waste and Output Flow Indicators

per 1 metric ton of product.

Indicator	Unit	A1 - A3
HWD	kg	3.92e-3
NHWD	kg	6.40e+1
HLRW	kg	1.02e-4
ILLRW	kg	8.61e-2
CRU	kg	0
MFR	kg	0
MER	kg	0
MNER	kg	0
EEE	MJ	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.

Carbon Emissions and Removals

per 1 metric ton of product.

Indicator	Unit	A1 - A3
BCRP	kg CO2	-5.72e-2
BCEP	kg CO2	0
BCRK	kg CO2	-1.64e+1
BCEK	kg CO2	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

BCRP = Biogenic Carbon Removal from Product, BCEP = Biogenic Carbon Emission from Product, BCRK = Biogenic Carbon Removal from Packaging, BCEK = Biogenic Carbon Emission from Packaging, BCEW = Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes, CCE = Calcination Carbon Emissions, CCR = Carbonation Carbon Removals, CWNR = Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes, GWP-luc = Carbon Emissions from Land-use Change.

Interpretation

The cradle-to-gate production (A1–A3) of High and Ultra high density Spray Applied Fire-Resistive Materials (SFRM) requires approximately 5.2 GJ of total primary energy (LHV) and results in about 554 kg CO_2e per metric ton of product (GWP, excluding biogenic carbon, IPCC AR6). The higher environmental impacts relative to lower-density SFRM products are primarily associated with increased raw material intensity and transportation requirements.

Across the life cycle stages, Module A1 (raw material extraction and upstream processing) is the dominant contributor, accounting for approximately 73% of total GWP (~406 kg CO_2e). This confirms that the environmental profile of ultra-high-density SFRM is largely driven by the production and processing of constituent raw materials and additives.

Module A2 (transportation) contributes a significant share of approximately 25% of total GWP (~139 kg CO_2e), which is substantially higher than observed for lower-density SFRM products. This indicates that transportation logistics, haul distances, and material sourcing play a major role in the overall environmental burden of this formulation. Transportation also contributes strongly to impact categories such as photochemical ozone creation potential (POCP), acidification potential (AP), and fossil energy demand.

Module A3 (manufacturing) contributes a relatively small portion of the total impacts at approximately 1-2% (~8.9 kg CO_2e), associated with on-site electricity consumption, process energy use, and operational activities within the manufacturing facility. In some impact categories, the manufacturing contribution is comparatively negligible relative to upstream and transportation impacts.

The resource use profile demonstrates that non-renewable primary energy resources dominate the total energy demand, with fossil energy demand exceeding 5.1 GJ per metric ton of product. Renewable primary energy use contributes approximately 724 MJ, while freshwater consumption remains relatively modest at approximately 0.81 m^3 per metric ton of product.





Further Information

Technical Data for SFRMs

Primary Binding Agent	GCPAT SFRM- Sub-category	Dry density, minimum average- in kg/m3 (pcf)	GCPAT Brand Names
Gypsum - based	Standard density	640 (40)	Z-146, Z-146PC, Z-146T, Z-156, Z-156PC, Z-156T

References

- Smart Epd® Part A Product Category Rules For Building And Construction Products And Services Standard 1000, Version 1.2, March 14, 2025
- Smart Epd® Part B Product Category Rules For Spray-Applied Fire-Resistive Materials (SFRM) Standard 1000-003, Version 4.0, January 16, 2025
- 14020:2000 Environmental labels and declarations – General Principles
- ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – principles and procedures
- ISO/TS 14027:2017 Environmental labels and declarations — Development of product category rules
- ISO/TS 14029:2022 Environmental statements and programmes for products — Mutual recognition of environmental product declarations (EPDs) and footprint communication programmes
- ISO 14040:2006/Amd1:2020 Environmental management – Life cycle assessment – Principles and framework
- ISO 14044:2006/Amd1L2017/Amd2:2020 Environmental management – Life cycle assessment – Requirements and guidelines

- Smart EPD Part A Product Category Rules for Building and Construction Products and Services, Standard 1000
- ISO 14046:2014 Environmental management – Water footprint – Principles, requirements and guidelines
- ISO 14071:2014 Environmental management – Life cycle assessment – Critical review processes and reviewer competencies: Additional requirements and guidelines to ISO 14044:2006
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
- EN 15804+A2:2019/AC:2021 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- Sphera LCA FE Databases. https://lcadatabase.sphera.com/
- Ecoinvent Database 3.12. http://ecoinvent.org/
- StatCan website: https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/provincial-territorial-energy-profiles/provincial-territorial-energy-profiles-quebec.html