Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

SCG MODEENA & MODISH

from

Siam Fibre Cement Group

Programme:	The International EPD® System, www.environdec.com
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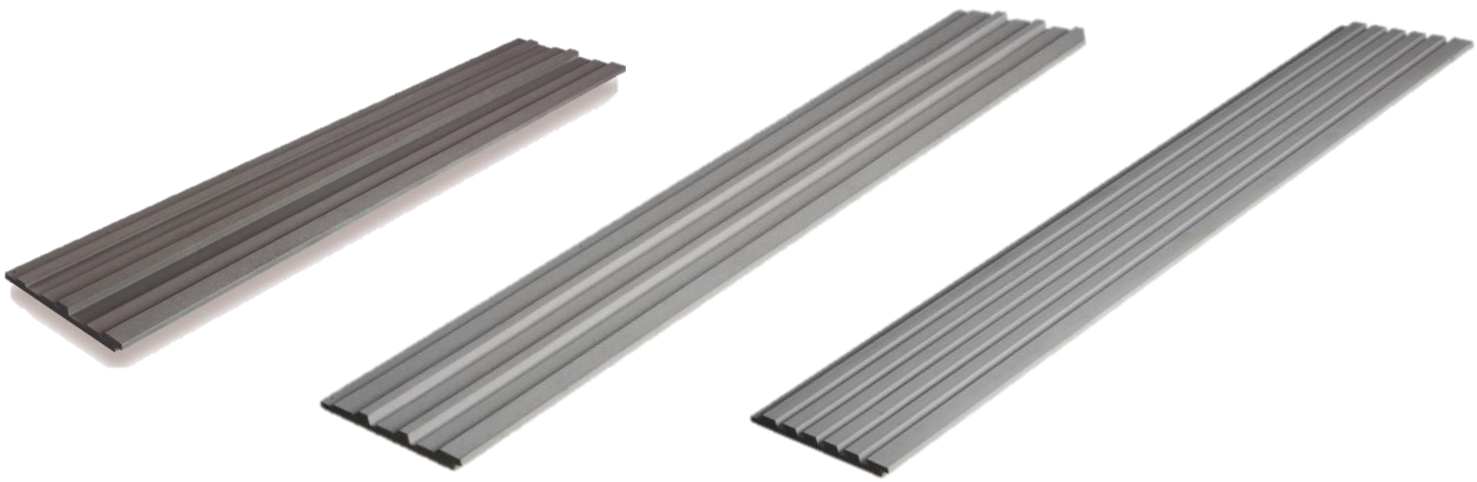
EPD of multiple products, based on the on the worst case results.



General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): *Construction Products PCR 2019:14 version 1.3.3*
PCR review was conducted by: *Martin Erlandsson, IVL Swedish Environmental Research Institute, Martin.Erlandsson@ivl.se*
Life Cycle Assessment (LCA)
LCA accountability: *Amy Stockwell, Carbonzero AB, Amy.Stockwell@carbonzero.se*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☐ EPD verification by individual verifier Third-party verifier: *Stephen Forson, Viridis Pride Ltd, S.Forson@viridispride.com* Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the 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.

Company information

Owner of the EPD: Siam Fibre Cement Group Co., Ltd
Contact: Suradej Sucharitakul, suradejs@scg.com
Description of the organisation: Siam Fibre Cement Group under the SCG corporate, a leading conglomerate in ASEAN, recognizes the importance of responsible business practices. It is elevating its operations by integrating sustainable development strategies in line with the United Nations' Sustainable Development Goals (SDGs) through the "ESG 4 Plus" approach, emphasizing Net Zero – Go Green – Reduce Inequality – Enhance Collaboration Plus Trust through Transparency.
Product-related or management system-related certifications:
ISO 9001 Quality Management System,
ISO 14001 Environmental Management System,
ISO 14024 Environmental labels and declarations (Type I Environmental labelling) from Philippines Green Choice Label by Philippine Center for Environmental Protection and Sustainable Development (PCEPSD)
ISO 14021 Environmental labels and declarations (Type II Self-declared environmental claims) from SCG Green Choice Label,
ISO 14025 Environmental labels and declarations (Type III Environmental declarations) from Thailand Carbon Footprint Label by Thailand Greenhouse Gas Management Organization (TGO)
Thailand Green Industry Award by Ministry of Industry, Thailand
Name and location of production site(s): Four sites in Thailand are Tha Luang Plant, Nong Khae Plant, Thung Song Plant, Lampang Plant

Product information

Product name: SCG MODEENA & MODISH
Product identification: Fiber cement Product (Non Asbestos)
Product description: Fiber Cement Decorative cladding for External and Internal. Manufactured by using X-Trusion technology, the product can be made into any desired shape and it can create pattern for unique style look. Product can paint to create modern or natural style. Product intended as cladding for residential commercial building both of new build and renovation. They are installed as construction fixed to timber frame, steel frame or masonry walls.
Products included: MODEENA: M1, M2, M3, M4, M5; MODISH U3.8, U3.9
UN CPC code: 37570
Geographical scope: Raw materials are sourced mainly from within Asia. Manufacturing is in Thailand. Products are sold worldwide, but Thai statistics were used for the disposal scenario.

Technical specification:

Specification	Test value	Standard
Physical Property		
Density	1300 ±50 Kg/m3	ASTM C1185
Modules of rupture (wet condition)	≥10 Mpa	ASTM C1185
Sound Resistant (STC)	38-61 dB *1	Marshall Day Programe
Heat or Thermal Conductivity (K)	0.134 W/M°k	ASTM C518
Water Apsorption	33%	ASTM C1185
Length changed after immersion in water (24 hrs.)	0.12%	JIS A 5414
Moisture Movement	0.06%	MS 1296
pH	7-8	Litmus test
Freeze/Thaw Resistance	Pass	ASTM C1185
Dimensionnal Conformance	Pass	ASTM C1186
Durability Properties		
Water Peameability	Pass	AS/NZS 2908.2
Warm Water Resistance	Pass	AS/NZS 2908.2
Soak/Dry Resistance	Pass	AS/NZS 2908.2
Heat/Rain Resistance	Pass	AS/NZS 2908.2
Fire resistance Properties		
Smoke developed index	Class A	ASTM E84-17
	0	Frame Spread Index(FSI)
	0	Smoke Developed Index(SDI)
Non-Combustible	Non-Combustible	BS 476 Part 4
Ignitability	Pass	BS 476 Part 5
Fire propagation	I=0	BS 476 Part 6
Surface spread of flame	Class 1	BS 476 Part 7
Fire resistance System	60-180 *2	BS 476 Part 22
Single Burning Item	Pass	En 13823 : 2010
Fire Classification	A2s2d0	BS EN 13501-1:2007+A1:2009
Other		
Bending Radius (4,6,8 mm.)	1.2,1.8,3.0 m.	

*1 The STC value is derived from the Marshall Day program with a tolerance of +/- 3 STC.
*2 Depends on the selected system.

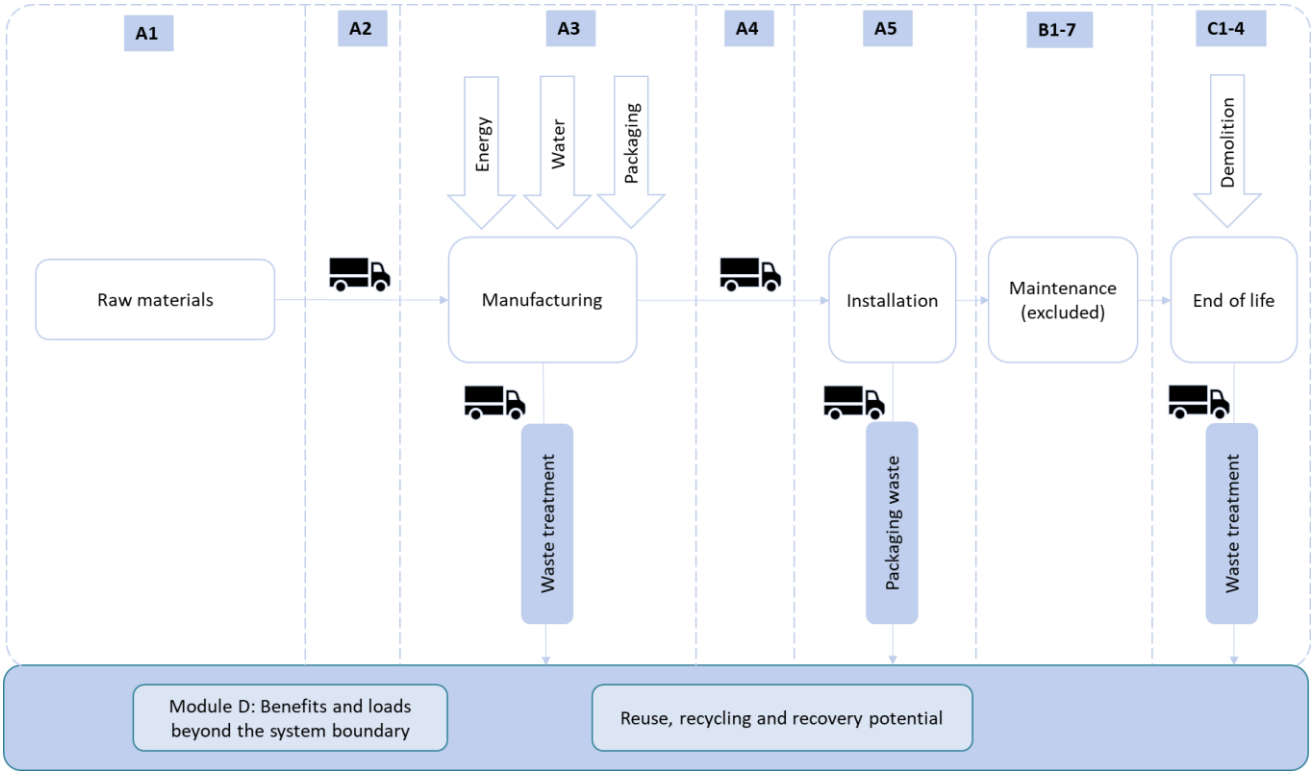
LCA information

Functional unit / declared unit: 1 kg fibre cement product with packaging
Reference service life: 50 years
Time representativeness: Manufacturing data from 2023.
Database(s) and LCA software used: LCA for Experts (GaBi) v10.7.1.28, Ecoinvent 3.8
Description of system boundaries: Cradle to gate with options, modules A1-A3, A4-A5, C1–C4, D
Allocation: the factories produce a range of cement based products. Actual manufacturing data for A3 was recorded for 2023. The allocation used a combination of economic (where feasible) and mass allocation by the accounting and production teams.
Gypsum allocation was already in the Sphera dataset which specified the following allocation:

- Foreground system: For the foreground system, no allocation was applied.
- Background system: For the combined heat and power production, allocation by exergetic content is applied. For the electricity generation and by-products, e.g. gypsum, allocation by market value is applied due to no common physical properties. Within the refinery allocation by net calorific value and mass is used. For the combined crude oil, natural gas and natural gas liquids production allocation by net calorific value is applied.

Cut off rules were followed as per EN15804.

System diagram:

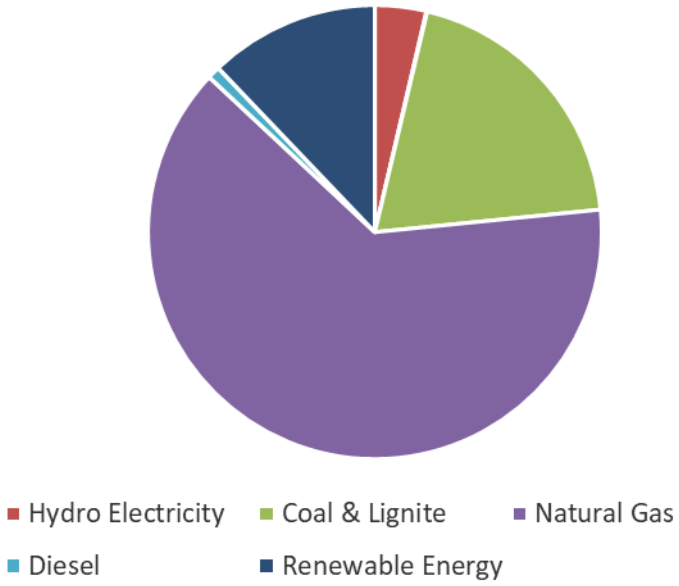


More information:

A3 electricity: The electricity grid mix (TGO 2022) used in this study can be seen in figure to the right. It has a climate change total of 0.541 kg CO2e per kWh.

No residual grid mix data could be found for Thailand. The renewable energy was not defined, so photovoltaic was assumed. Imported electricity was assumed to have the same ratio of inputs.

The impact of grid electricity is <5% of the impact of A1-A3. Therefore corrections would make negligible impact on the results.



A4 transport to building site. The products are sold worldwide. A weighted average transport distance was calculated and used.

	Truck	Ship
Vehicle and fuel types	Truck-trailer, Euro 0 - 6 mix, 34 - 40t gross weight / 27t payload capacity Using 0.021 kg diesel per tkm	Container ship, 5.000 to 200.000 dwt payload capacity, deep sea Using 0.0027 kg heavy fuel oil per tkm
Distance /km	130	2000
Capacity utilisation /%	61 Dataset default value	70 Dataset default value
Bulk density of transported products / kg/m^3	1100	1100
Volume capacity utilisation factor	1	1

A5 installation: the fibre cement blocks are small enough to be installed by hand. Therefore the impacts are due to packaging waste disposal, shown in the table below. Pallets were assumed to be reused.

C1-4 waste treatment:
A generic dataset was used to calculate the demolition, as the product is a part of the construction. The dataset specifies 0.172 kg diesel used per tonne of excavated material.

Waste statistics were taken from Thai Government Office (TGO) carbon footprint calculation guidance. Everything else is assumed to be sent to landfill. As the biogenic carbon content of the product is <7%, and encased in the inorganic material, it was treated as inert waste in landfill and the biogenic carbon content was manually balanced.

Waste	% Thailand Recycle	Packaging (A5)		Product (C3-4)	
		Weight to recycling /kg	Weight to landfill /kg	Weight to recycling /kg	Weight to landfill /kg
Paper	77	5.94E-4	1.77E-4	n/a	n/a
Plastic	87	3.95E-3	5.90E-4	n/a	n/a
Other	Not specified	n/a	n/a	0	1

D benefits: recycled plastic was substituted with virgin LDPE granulate. No datasets were available for recycling paper and card, so a 10% loss was assumed and the material substituted with kraftliner.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	TH	GLO	GLO	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific data used	46 - 50%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-10 +8%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	-16% +12%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	**Weight, kg**	**Post-consumer material, weight-%**	**Biogenic material, weight-% and kg C/kg**
Sand	0.3 - 0.4	0	0
Cement	0.2 - 0.4	0	0
Pulp	0.06 - 0.07	0	3 % 0.03 kg
Additives	0.3 – 0.4	0	0
TOTAL	1	0	3 % 0.03 kg
Packaging materials	**Maximum weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
Paper and board	7.71E-04	0.1%	3.43E-04
Plastic	4.54E-03	0.5%	0
Pallet	5.43E-02	5.4%	2.25E-02
TOTAL	5.96E-02	6.0%	2.29E-02

There are no dangerous substances from the candidate list of SVHC for Authorisation

Results of the environmental performance indicators

Using EN15804 reference package EF3.1

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	5.36E-01	3.31E-02	9.43E-03	6.59E-04	7.85E-03	0.00E+00	1.50E-02	-6.70E-03
GWP-biogenic	kg CO_2 eq.	-1.16E-01	5.15E-05	5.53E-02	8.62E-08	2.43E-05	0.00E+00	6.22E-02	-2.82E-04
GWP-luluc	kg CO_2 eq.	2.70E-04	1.70E-04	1.36E-04	1.52E-08	1.28E-04	0.00E+00	8.98E-05	-3.13E-06
GWP-total	kg CO_2 eq.	4.20E-01	3.33E-02	6.48E-02	6.59E-04	8.00E-03	0.00E+00	7.73E-02	-6.98E-03
ODP	kg CFC 11 eq.	6.07E-10	3.23E-15	1.56E-14	1.27E-17	1.13E-15	0.00E+00	4.04E-14	-4.36E-14
AP	mol H^+ eq.	8.45E-04	4.38E-04	1.23E-05	3.09E-06	1.00E-05	0.00E+00	1.06E-04	-9.71E-06
EP-freshwater	kg P eq.	1.69E-06	4.90E-08	5.67E-08	1.02E-10	3.26E-08	0.00E+00	3.40E-08	-2.04E-08
EP-marine	kg N eq.	3.07E-04	1.84E-04	4.36E-06	1.44E-06	3.69E-06	0.00E+00	2.74E-05	-2.97E-06
EP-terrestrial	mol N eq.	3.36E-03	2.02E-03	5.01E-05	1.58E-05	4.30E-05	0.00E+00	3.01E-04	-3.07E-05
POCP	kg NMVOC eq.	8.95E-04	5.06E-04	1.20E-05	4.19E-06	1.02E-05	0.00E+00	8.37E-05	-1.08E-05
ADP-minerals&metals*	kg Sb eq.	1.07E-07	1.37E-09	9.55E-10	7.89E-12	6.66E-10	0.00E+00	9.70E-10	-8.07E-10
ADP-fossil*	MJ	5.75E+00	4.01E-01	1.22E-01	8.76E-03	1.01E-01	0.00E+00	1.97E-01	-2.36E-01
WDP*	m^3	2.24E-02	1.97E-04	3.44E-04	8.21E-07	1.18E-04	0.00E+00	1.71E-03	-1.42E-04
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption								

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	5.37E-01	3.34E-02	9.78E-03	6.59E-04	8.01E-03	0.00E+00	1.51E-02	-6.74E-03

Resource use indicators

Results per functional or declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	-1.68E+00	1.27E-02	3.19E-02	1.81E-05	8.67E-03	0.00E+00	3.44E-02	-2.75E-02
PERM	MJ	2.47E+00	0.00E+00	-1.10E+00	0.00E+00	0.00E+00	0.00E+00	-1.37E+00	-9.08E-03
PERT	MJ	7.93E-01	1.27E-02	-1.07E+00	1.81E-05	8.67E-03	0.00E+00	-1.34E+00	-3.66E-02
PENRE	MJ	5.37E+00	4.01E-01	3.37E-01	8.76E-03	1.01E-01	0.00E+00	1.97E-01	-7.88E-02
PENRM	MJ	3.81E-01	0.00E+00	-2.15E-01	0.00E+00	0.00E+00	0.00E+00	-1.66E-01	-1.57E-01
PENRT	MJ	5.75E+00	4.01E-01	1.22E-01	8.76E-03	1.01E-01	0.00E+00	3.14E-02	-2.36E-01
SM	kg	1.13E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	7.71E-04	1.44E-05	1.86E-05	2.53E-08	9.66E-06	0.00E+00	5.23E-05	-2.81E-05
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water								

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Waste indicators

Results per functional or declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1.02E-09	1.34E-11	4.83E-10	1.11E-13	3.86E-12	0.00E+00	4.91E-11	-1.50E-10
Non-hazardous waste disposed	kg	8.97E-03	4.74E-05	1.15E-03	1.34E-07	1.64E-05	0.00E+00	1.00E+00	-8.48E-05
Radioactive waste disposed	kg	6.65E-05	5.50E-07	2.31E-06	1.10E-09	1.83E-07	0.00E+00	2.07E-06	-2.04E-06

Output flow indicators

Results per functional or declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	1.30E-04	0.00E+00	5.43E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	4.14E-05	0.00E+00	4.54E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Disclaimers

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Using the results of modules A1-A3 without considering the results of module C is discouraged.

ILCD classification	Indicator	Disclaimer
ILCD Type 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD Type 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD Type 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
	Potential Soil quality index (SQP)	2
Disclaimer 1 – This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.		
Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.		

Additional environmental information

Siam Fibre Cement Group is committed to sustainable development across all of our activities. We implement practices that aim to benefit the building environment, the communities in which we work and the wider economy.

Designed to save Climate & Energy

Siam Fibre Cement Group design with sustainability and net zero policy in mind. We focus on developing innovative products that can be used in energy efficient buildings. We continuously improve our production processes for greater energy efficiency and lower greenhouse gas emissions to achieve our Net Zero goals.

Improved for Circularity

Our production processes have been improved to increase circularity. We have increased recycled content to reduce virgin raw material use. All pulp used in our product is obtained from sources

certified under FSC sustainable forestry schemes. All Siam Fibre Cement Group plants have zero process wastewater discharge, as we circulate all process wastewater within our plant.

Engineered for well-being
Our fibre cement is designed to be protected from algae and mould by our coating technology. This coating is classified as 'Low emitting Volatile Organic Compounds (VOCs) material, in order to suitable to use for 'green building'.

Additional social and economic information

Health and Safety is one of enterprise materiality that important to Siam Fibre Cement Group and integrated SCG safety framework and had been supervised by Safety Performance Assessment Program, SPAP, into long term plan, We continue to enhance the standard for safety supervision and control to the present to eventually achieve the goal of Injury and Illness Free sustainably.

Siam Fibre Cement Group conducts socially-responsible business together with community and social development, placing priority on playing an active part in tackling social problems that impact livelihood and quality of life, enhancing economic strength, and reducing social inequality.

References

EN 15804:2012+A2	Sustainability of construction works – Environmental product declaration – Core rules for the product category of constructions products
EPD International (2021)	General Programme Instructions of the International EPD® System, version 4.0
ISO 14020:2022	International Standard ISO 14020 – Environmental statements and programmes for products – Principles and general requirements
ISO 14025:2006	International Standard ISO 14025 – Environmental labels and declarations — Type III environmental declarations — Principles and procedures
ISO 14040:2006	International Standard ISO 14040: Environmental Management – Life cycle assessment – Principles and framework. Second edition 2006-07-01.
ISO 14044:2006	International Standard ISO 14044: Environmental Management – Life cycle assessment – Requirements and Guidelines.
PCR 2019:14	Construction products v1.3.3
TGO 2020	Thai greenhouse gas management organisation, Calculation requirements and guidelines, Product Carbon Footprint Translated by SFCG.
TGO 2022	Thai greenhouse gas management organisation, Table 5.2-2Y power generation classified by fuel type www.tgo.or.th accessed 2024-04-01

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