

Environmental Product Declaration



EPD of multiple products, based on the average result of the product group in accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

ArmaGirt

from

ARMATHERM



Programme:

Programme operator:

EPD registration number:

Publication date:

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Valid until:

The International EPD® System, www.environdec.com

EPD International AB, as provided by EPD North America

S-P-13877

2024-05-15

2024-06-18 (Version 1.1)

2029-05-15

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



General information

Programme information

Programme:	The International EPD® System As provided by EPD North America
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): PCR 2019:14 Construction products (v1.3.2)

PCR review was conducted by: Claudia A. Peña, info@environdec.com

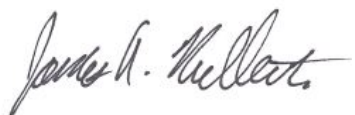
Life Cycle Assessment (LCA)

LCA accountability: Unmesh Gattane and Alana Brittin, WAP Sustainability

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: *James Mellentine, Thrive ESG*

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

EPD Owner: Armatherm

Contact: Neal Lojek, neal@armatherm.com

Address: 1 Titleist Drive, Acushnet, MA 02743

Description of the organization: Armatherm is one of the leading suppliers of structural thermal break materials for the construction industry. Their goal is to provide architects, structural engineers and building design professionals with effective solutions to prevent thermal bridging.

Product information

Product name: ArmaGirt

UN CPC Classification: UN CPC 3712

Product description: Safe, durable and efficient, an ArmaGirt thermal bridging solution can help minimize energy loss and significantly improve envelope performance, especially when paired alongside Armatherm™'s vast range of thermal break products. If you need help with your construction project to meet new building regulations, you can get in touch with our expert team who can help advise and specify the best product and inform you all about fiberglass ArmaGirts. You can also visit our website which features a number of helpful online resources to take advantage of, including test reports, design assistance, literature libraries and ArmaGirt product profile videos to help you achieve a better understanding of thermal break products, key features and the applications they're best suited to. Further information can be found on Armatherm's website here:

<https://www.armatherm.com/thermal-break-materials/armatherm-z-girt/>

Geographical scope: Manufactured in Gujarat, India and sold in the United States.

Multiple product justification: This EPD is an EPD of multiple products where the average result of the included products is declared for each indicator according to the first option in section 2.2.2.1 of the Construction Products PCR. The product dimensions are all manufactured at the same location, are manufactured by the same company, and have the same major steps in core processes.

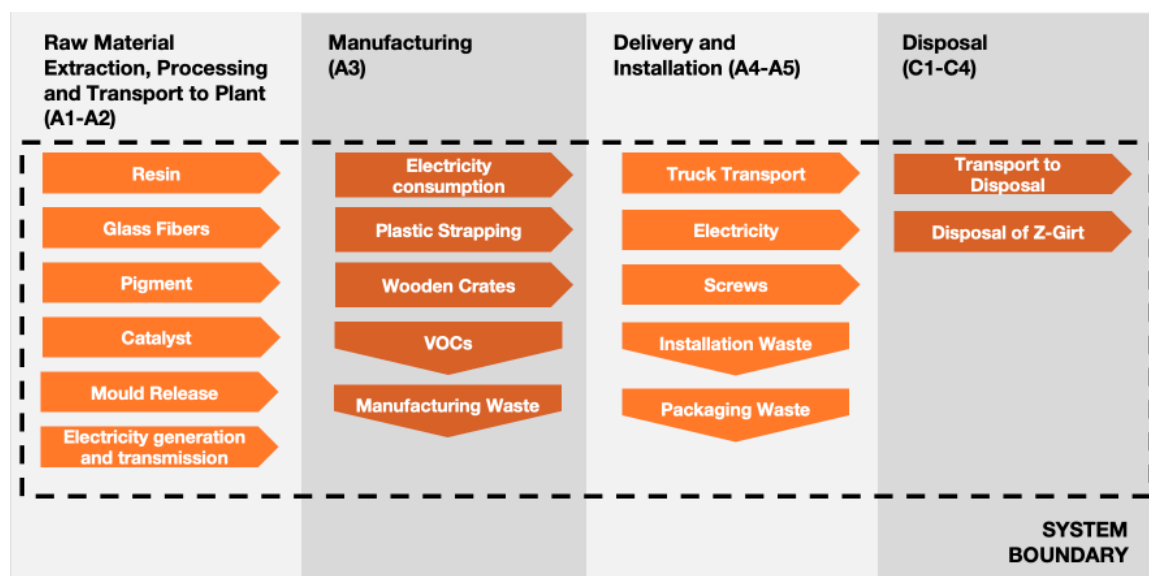


LCA information

Declared unit	1 linear foot [30.48cm] of installed ArmaGirt (weighted average of product depth dimensions 1.5" [3.81cm], 2" [5.08cm], 3" [7.62cm], 3.5" [8.89cm], 4" [10.2cm], 6" [15.2cm])
Reference service life	Not declared as use phase is not included in the study
Description of the system boundaries	Cradle to Gate with Options, including A1-A3, A4, A5, C1-C4, and D
Geographical representativeness	A1-A2: Global, A3: India, A4-A5: United States, C1-C4, D: United States
Time representativeness	Primary data collected for calendar year 2022
Cut-off rules	All flows for which data were provided are included in the assessment, accounting for at least 99% of the energy or mass flows and at least 99% of the environmental impacts from the product system. Production of capital equipment is excluded from this assessment.
Database and LCA software used	LCA FE 10.7 (formerly GaBi) MLC Database 2023.1 (formerly GaBi Database)
LCA Report	LCA of ArmaGirt, WAP Sustainability, April 2024
Scenario Description: A2	Primary data of transportation from suppliers: 300 km by truck, 8,567 km by ship Fuel Efficiency Truck (full vehicle): 42 L/100km, Capacity Utilization: 61% Fuel Efficiency Ship bulk commodity carrier, 1,000 to 250,000 dwt payload capacity, deep sea: 18,358 L/100km, Capacity Utilization: 53%
Scenario Description: A3	Electricity Source: country-specific residual mix located in India western region power grid. GWP-GHG = 1.16 kg CO ₂ e/kWh
Scenario Description: A4 Transport to Building Site	Weighted Average of Products Dimensions Sold into US Market: 3674 km truck, 15704 km ship Fuel Efficiency (full vehicle): Truck = 42 L Diesel/100km, Ship = 18,358 L Heavy Fuel Oil/100km, Bulk density = 1525 kg/m ³ Capacity Utilization Factor: 67% Truck, 53% Ship
Scenario Description: A5 Installation	One 2" length and ¼" diameter screw installed using 0.00181 kWh electricity per linear foot. 0.0361 kg installation waste (product loss and packaging) sent to landfill.
Scenario Description: C1-C4 End-of-Life	0.00181 kWh electricity required to unscrew one screw per linear foot. 0.509 kg collected with mixed construction waste and sent 161km by truck to end-of-life (100% landfilled). Fuel Efficiency (full vehicle): 42 L/100km, Capacity Utilization: 61%

Scenario Description: D	There were no benefits declared beyond the system boundary.
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System diagram:



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	Global		India	Global	US	ND	ND	ND	ND	ND	ND	ND	US	US	US	US	US
Specific data used	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-37.8%/62.9%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Average Weight, kg (per linear foot)	Range in Weight across dimensions, kg (per linear foot)	Post-consumer material, weight-%	Weighted Average biogenic carbon, kg C (per linear foot)
Resin	0.192	0.119 - 0.313	0%	0%
Glass Fiber	0.272	0.179 - 0.470	0%	0%
TOTAL	0.464	0.299 - 0.783	0%	0%
Packaging materials	Average Weight, kg (per linear foot)	Range in Weight across dimensions, kg (per linear foot)	Weight-% (versus the product)	Weighted Average biogenic carbon, kg C (per linear foot)
Plastic Strapping	0.000419	0.0000247 – 0.0000711	0.00902%	0.00
Wooden Crates	0.0259	0.0153 – 0.0440	5.58%	0.0112
TOTAL	0.0259	0.0153 – 0.0440	5.59%	0.0112

No substances in the product are on the Candidate List of Substances of Very High Concern (SVHC) which exceed the limits for registration with the European Chemicals Agency

Results of the environmental performance indicators

The results presented here are for 1 declared unit, which is 1 linear foot of ArmaGirt. This is a weighted production average results set and the variability in results across product sizes is reported in the %Var A-C column.

Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D	%Var A-C
Core Environmental Impact Indicators											
GWP-GHG	kg CO ₂ eq.	1.08E+00	1.88E-01	1.83E-01	ND	2.37E-04	6.69E-03	0.00E+00	1.10E-02	0.00E+00	-36.5%/58.4%
GWP-total	kg CO ₂ eq.	1.08E+00	1.88E-01	1.83E-01	ND	2.37E-04	6.70E-03	0.00E+00	1.10E-02	0.00E+00	-36.5%/58.4%
GWP-fossil	kg CO ₂ eq.	1.12E+00	1.88E-01	9.77E-02	ND	2.37E-04	6.68E-03	0.00E+00	1.10E-02	0.00E+00	-36.4%/58.2%
GWP-biogenic	kg CO ₂ eq.	-3.75E-02	1.60E-04	8.55E-02	ND	6.13E-08	6.62E-06	0.00E+00	2.01E-05	0.00E+00	-40.3%/66%
GWP-luluc	kg CO ₂ eq.	1.10E-04	1.79E-04	3.41E-05	ND	1.50E-08	7.61E-06	0.00E+00	4.12E-06	0.00E+00	-35.2%/56.4%
ODP	kg CFC 11 eq.	1.72E-12	2.22E-14	3.40E-13	ND	1.17E-15	8.20E-16	0.00E+00	2.54E-14	0.00E+00	-32.7%/52.3%
AP	mol H ⁺ eq.	5.79E-03	1.76E-03	7.00E-04	ND	3.36E-07	2.01E-05	0.00E+00	6.71E-05	0.00E+00	-36.1%/57.8%
EP-freshwater	kg P eq.	2.75E-06	7.78E-07	3.76E-07	ND	1.42E-10	3.29E-08	0.00E+00	1.99E-08	0.00E+00	-37.1%/59.4%
EP-marine	kg N eq.	9.45E-04	6.34E-04	1.30E-04	ND	7.48E-08	9.90E-06	0.00E+00	1.68E-05	0.00E+00	-37%/59.3%
EP-terrestrial	mol N eq.	1.03E-02	6.97E-03	1.37E-03	ND	8.12E-07	1.09E-04	0.00E+00	1.84E-04	0.00E+00	-37%/59.2%
POCP	kg NMVOC eq.	3.49E-03	1.48E-03	3.33E-04	ND	2.14E-07	1.96E-05	0.00E+00	5.10E-05	0.00E+00	-37%/59.2%
ADP-minerals&metals ¹	kg Sb eq.	1.51E-07	1.19E-08	1.88E-06	ND	1.52E-11	4.39E-10	0.00E+00	6.30E-10	0.00E+00	-2.7%/3.6%
ADP-fossil ¹	MJ	2.34E+01	2.41E+00	1.61E+00	ND	4.05E-03	8.78E-02	0.00E+00	1.71E-01	0.00E+00	-36.8%/58.8%
WDP ¹	m ³	1.81E-01	9.28E-03	1.61E-02	ND	5.38E-05	3.90E-04	0.00E+00	5.81E-04	0.00E+00	-36%/57.7%
Resource Use Indicators											
PERE	MJ	1.75E+00	9.08E-02	2.34E-01	ND	9.71E-04	3.75E-03	0.00E+00	2.04E-02	0.00E+00	-35.2%/56.7%
PERM	MJ	3.90E-01	0.00E+00	1.50E-02	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-40.6%/66.7%
PERT	MJ	2.14E+00	9.08E-02	2.49E-01	ND	9.71E-04	3.75E-03	0.00E+00	2.04E-02	0.00E+00	-36.1%/58.3%
PENRE	MJ	1.80E+01	2.59E+00	1.41E+00	ND	4.05E-03	9.42E-02	0.00E+00	1.74E-01	0.00E+00	-36.6%/58.5%
PENRM	MJ	5.90E+00	0.00E+00	2.28E-01	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-37.6%/60.1%
PENRT	MJ	2.40E+01	2.59E+00	1.64E+00	ND	4.05E-03	9.42E-02	0.00E+00	1.74E-01	0.00E+00	-36.8%/58.9%
SM	kg	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0%/0%
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0%/0%
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0%/0%
FW	m ³	5.22E-03	3.07E-04	4.63E-04	ND	1.64E-06	1.29E-05	0.00E+00	2.16E-05	0.00E+00	-36.1%/57.7%
Waste and Output Flow Indicators											
Hazardous waste disposed	kg	6.54E-10	7.40E-12	2.67E-11	ND	-5.37E-14	2.71E-13	0.00E+00	4.34E-12	0.00E+00	-37.5%/60%
Non-hazardous waste disposed	kg	7.96E-02	2.11E-04	4.59E-02	ND	1.35E-06	8.20E-06	0.00E+00	5.20E-01	0.00E+00	-36.3%/55.9%
Radioactive waste disposed	kg	4.99E-04	7.35E-06	3.76E-05	ND	3.98E-07	2.70E-07	0.00E+00	1.93E-06	0.00E+00	-36.4%/58.3%

Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D	%Var A-C
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0%/0%
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0%/0%
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0%/0%
Exported energy, electricity	MJ	0.00E+00	0.00E+00	8.89E-03	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	- 40.6%/66.6%
Exported energy, thermal	MJ	0.00E+00	0.00E+00	4.18E-03	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	- 40.6%/66.6%

Optional indicators

PM	Disease incidence	7.56E-08	2.55E-08	9.92E-09	ND	3.12E-12	2.17E-10	0.00E+00	7.54E-10	0.00E+00	- 36.4%/58.6%
IRP	kBq U235	4.19E-02	6.19E-04	3.80E-03	ND	3.29E-05	2.28E-05	0.00E+00	1.86E-04	0.00E+00	- 35.9%/57.4%
ETP-fw	CTUe	9.35E+00	2.02E+00	9.53E-01	ND	1.10E-03	7.35E-02	0.00E+00	7.96E-02	0.00E+00	-37%/59.2%
HTP-c	CTUh	6.37E-10	4.46E-11	2.03E-08	ND	3.16E-14	1.34E-12	0.00E+00	1.12E-11	0.00E+00	-0.8%/0.6%
HTP-nc	CTUh	6.19E-09	7.38E-10	1.01E-09	ND	5.57E-13	2.73E-11	0.00E+00	1.16E-09	0.00E+00	-35%/55.7%
SQP	dimensionless	1.96E+00	3.89E-01	2.17E-01	ND	3.95E-04	1.65E-02	0.00E+00	1.46E-02	0.00E+00	- 37.3%/60.4%

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, 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

EN 15804+A2 with reference package EF3.1 was used to calculate results. 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. The results of modules A1-A3 shouldn't be used without considering the results of module C. A1-A3 results include the "balancing-out reporting" of biogenic CO₂ of packaging, traditionally released in A5. Additional optional indicators per EN 15804+A2 are declared, including: particulate matter emissions; ionizing radiation, human health; eco-toxicity (freshwater); human toxicity, cancer effects; human toxicity, non-cancer effects; land use related impacts/soil quality.

The primary energy resources used as raw materials were calculated by multiplying the mass of each material of the product and packaging content with the lower calorific value (MJ/kg) of the material. Specifically, option B within Annex 3 of the PCR was utilized for these calculations, whereby the energy used as raw material is declared as an input to the module where it enters the product system and as an output from the product system if it exits the product system as useful energy.

Additional environmental information

No additional environmental, social, or economic information is declared in this EPD.

References

- General Programme Instructions of the International EPD® System. Version 4.0.
- PCR 2019:14. Construction Products. Version 1.3.2.
- EN 15804:2012+A2:2019/AC:2021. European Committee for Standardization.
- Life Cycle Assessment for ArmaGirt produced by Armatherm. WAP Sustainability. April 2024

Differences Versus Previous Versions:

2024-05-15 Version 1

2024-06-18 Version 1.1

Editorial change: Changed product name from Armatherm Z-Girt to ArmaGirt



