Environmental Product Declaration

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

Cladding: aluminum honeycomb backing and porcelain facing

from

Cladify

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB; this EPD is registered through aligned regional licensee: EPD North America (www.epdna.com)
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Programme information

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

Product category rules (PCR): *'Construction Products' Product Category Rules (ISO 14025) 2019:14 Version 1.3.4 - Updated 2024-04-30 and Valid Until 2025-06-20 UN CPC 42999* *EN 15804:2012+A2:2019/AC:2021, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.*
PCR review was conducted by: *Claudia Pena, IVL Swedish Environmental Research Institute*
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: *Stephen Forson, ViridisPride Ltd, s.forson@viridispride.com* *In case of recognised individual verifiers:* Approved by: The International EPD® System LCA Practitioner: Katie Soulliere, LCA Design Corporation, *k.soulliere@lcadesign.ca*
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 from different programs may not be comparable. 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.

EPDs within the same product category but registered in different EPD programmes 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. EPDs of construction products may not be comparable if they do not comply with EN 15804. The EPD is in conformity with EN 15804:2012+A2:2019/AC:2021 and ISO 14025.

Company information

Owner of the EPD:
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Description of the organization:
Mitrex & Cladify, world leaders in sustainable building materials, bring over 20 years of manufacturing expertise of architectural panels and stand as the largest building-integrated solar technology (BIPV) manufacturer globally. Their mission is to drive the widespread adoption of sustainable materials, firmly believing that sustainable manufacturing, procurement, and import practices are not only economically viable but also critical for a better future. They are committed to creating a world where sustainability is seamlessly integrated into every aspect of design and construction.

With roots in crafting luxurious stone facades, their expertise evolved into advanced lightweight cladding systems through the Cladify brand, culminating in groundbreaking innovations in Mitrex's solar technology launched in 2020. The Cladify system offers architectural panels with multi-facing options ranging from stone, metal, brick, porcelain and solar, underpinned by a durable aluminum honeycomb core. Mitrex products transform building exteriors into energy-generating facades utilizing the high-performing Cladify system with a solar facing, effectively turning structures into self-sustaining power stations.

The Mitrex & Cladify vision is to revolutionize the construction industry by embedding sustainability into every structure, empowering buildings to produce renewable energy while maintaining aesthetic excellence. Mitrex & Cladify represent the cutting edge of sustainable building, offering architects and developers materials that blend energy efficiency, durability, and design excellence.

Image: Aquabella at Bayside Condos, Toronto, Canada, 2020

Name and location of production site:
Cladify Manufacturing Facility 41 Racine Road, Etobicoke, Ontario, Canada, M9W 2Z4

Product information

Product name: Cladding: aluminum honeycomb backing and porcelain facing

Product description:
The Cladify facade provides a versatile range of architectural panels, offering multi-facing options such as stone, metal, brick, porcelain, and solar. These panels are supported by a durable aluminum honeycomb core, delivering high-performance external envelope assemblies that enhance thermal efficiency, reduce sound transmission, and improve fire safety. Designed to accelerate construction timelines and reduce costs, Cladify panels are ideal for both new construction and renovations, making them a flexible solution for architects, designers, and builders. Whether used for commercial, institutional, residential, or multi-residential projects, this innovative cladding system enhances building performance while maintaining design and application versatility.

Cladify panels are available in a variety of systems, including rainscreen, pre-panelized/slab-to-slab, or unitized façades, allowing for seamless integration across different applications. Engineered for ease of installation, these panels are impact, crack, fire, and heat-resistant, waterproof, and environmentally sustainable. Made from a range of materials, Cladify offers endless design possibilities in virtually any pattern, shape, or size. With an exceptional warranty, this cost-effective cladding system is the ideal choice for projects requiring both transformational design and tight construction budgets.

UN CPC code: UN CPC 42999

Geographical scope: North America

Technical Data and General Information

Parameter	
Facing Thickness	0.24in (6mm)
Backing Thickness	0.98in, 1.24in, 2.24in (25mm, 31.4mm, 56.8mm
Weight	3.88lb/ft2, 3.91lb/ft2, or 4.03lb/ft2 (18.92kg/m2, 19.07kg/m2, or 19.68kg/m2)
Sound Transmission Class	STC 34
Fire Safety Certifications	NFPA 285, CAN/ULC S134, ASTM E84 (Class A)
Mechanical Certifications	ASTM C373 (Water Absorption), ASTM C1505 (Flexural Modulus), ASTM C1353 (Abrasion Resistance)
Durability	Scratch, stain, and temperature-resistant

TESTING & CERTIFICATIONS:

- EN 13501-1 (A2-s1,d0)
- ANSI Z97.1
- NFPA 285
- CAN/ULC-S134, CAN/ULC-S135
- ASTM B117-16, ASTM C271/C271M-16, ASTM C297/C297M-16, ASTM C364/C364M-16, ASTM C365, ASTM C393/C393M-16, ASTM C480/C480M-16, ASTM C273/C273M-18, ASTM C481-99 (Reapproved 2016), ASTM C666/C666M-15, ASTM C880/C880M-15, ASTM C897-08 (20160), ASTM D1761, ASTM D7766/D7766M-16
- ISO 10545-8
- ASTM E84, ASTM E136, ASTM E119
- ASTM E283, ASTM E330, ASTM E331
- ASTM E1886, ASTM E1996
- ASTM G154
- ASTM D6578
- ASTM 1363-11

Image: One Rainsford, Toronto, Canada, 2020

LCA information

A1 Raw material supply – Extraction, transport, refinement, and manufacturing of raw materials
A2 Transportation – Truck and ocean freighter transport from suppliers to manufacturing facility
A3 Manufacturing – Manufacturing, packaging, and waste treatment at Cladify facility. Manufacturing process consists of porcelain processing, aluminum procurement, lamination, and curing and finishing.
A4 Transport – Truck transport from manufacturing facility to construction site, based on average customers, assume 558 km.
A5 Construction installation – Cladding installation and packaging waste disposal. Assume electric power tools used for installation. Assume pallets are reused, cardboard is recycled, and PE shrink wrap is landfilled.
B1-B7 Use – No impacts during use of the cladding, considering no repair, replacement, refurbishment, operational energy use, or operational water use.
C1 Deconstruction, Demolition – Deconstruction of the cladding for removal and disposal.
C2 Transport – Truck transport from construction site to waste processing facility.
C3 Waste Processing – No waste processing is required.
C4 Disposal – Waste cladding is landfilled.
D) Benefits and Loads Beyond the System Boundary – No benefits beyond the system boundaries. Machinery and commuting of employees are excluded from the analysis.

Allocation Procedures:
Production rates vary depending on the dimension, shape, and type of the cladding panel being produced. The electrical energy values were provided per month and allocated to a panel based on the number of panels produced per month. No usable co-product allocation required.

Cut-off Procedures:
The LCI data includes >95% of total inflows per module and utilizes proxy data from databases to achieve 100% completeness. For the product stage A1-A3, 100% of total inflows are included in the LCI data.

Declared unit: 1 m^2
(19.89 kg/m^2)

Technical Lifespan: 60 Years

Time representativeness:
Primary data provided by Cladify from 2023-01-01 to 2023-12-31 for suppliers and manufacturing inflows at Cladify manufacturing facility.

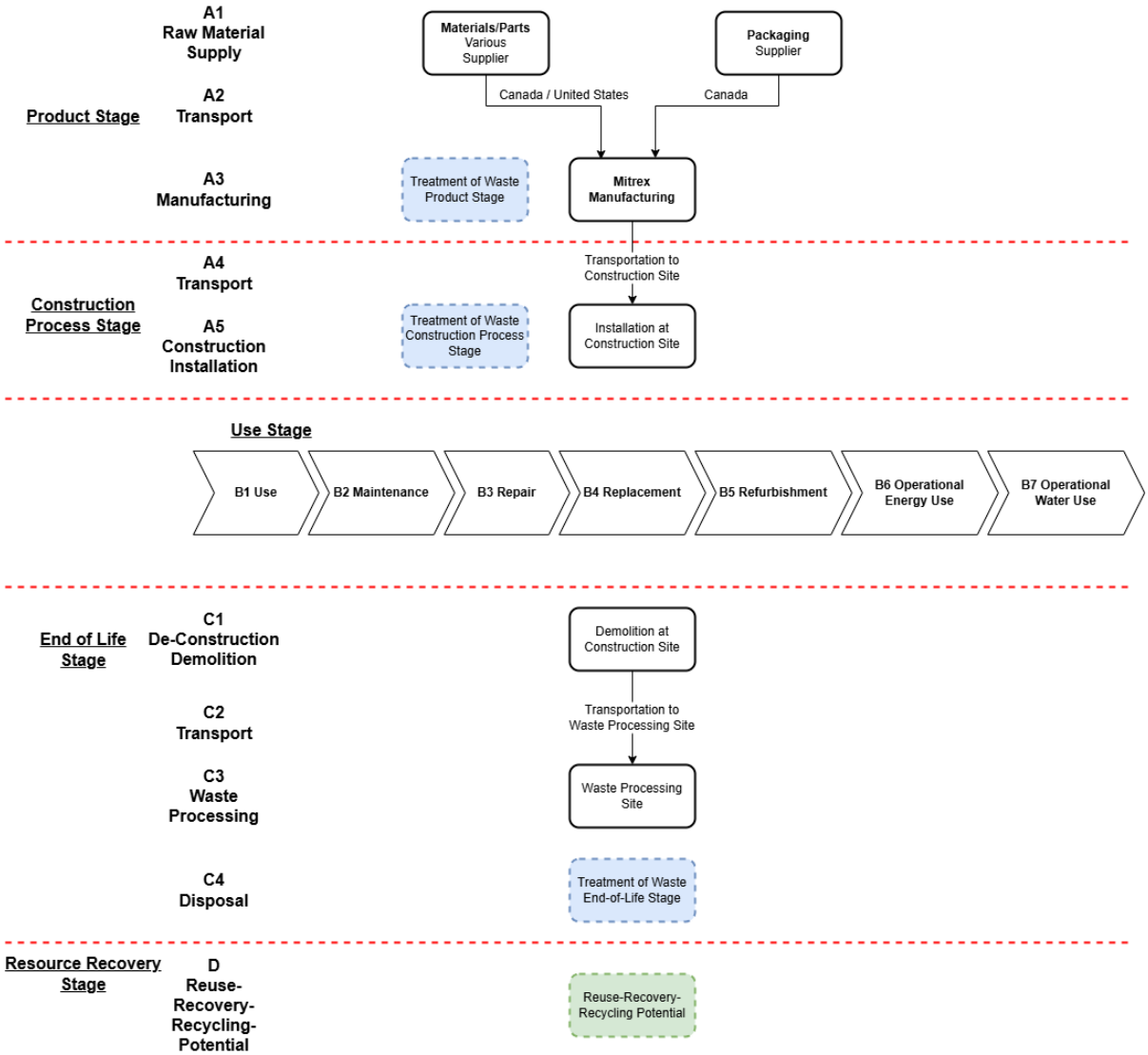
A3 Electricity Used in Manufacturing Process:
Canada Emission Factors and Reference Values 2023 – Electricity Ontario: 0.03 kg CO2e/kWh

Ontario Power Supply

Nuclear	50.8%
Hydro	24.5%
Natural Gas	12.5%
Wind	8.7%
Solar	2.3%
Bioenergy	0.4%
Other	0.8%

C2 and C4 End-of-life scenario:
Distance to waste processing facility: 100 km
Recovery system specified by type: 0 kg for recycling
Disposal specified by type: 19.89 kg for final deposition in landfill

Database(s) and LCA software used:
GaBi LCA Software Version 10.0
Sphera Database Version 2024
US LCI Database 2024



Description of system boundaries:

The EPD is type b) from the PCR document, which outlines the system boundaries for the cradle-to-grave LCA to include the product stage (A1-A3), construction stage (A4-A5), use stage (B1-B7), end-of-life stage (C1-C4), and benefits and loads beyond the system boundary stage (D).

EPD Type c) Functional Unit: Cradle-to-grave + module D																
	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	X	X	X	X	X	X	X	X	X	X	X	X
Geography	GLO	GLO	CA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Specific data used	10%			-		-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	0%			-		-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	0%			-		-	-	-	-	-	-	-	-	-	-	-	-

NA = North America

More information:
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Additional information

Explanatory material on safe installation, use, and disposal of the porcelain cladding can be found online https://www.cladify.com/porcelain-cladding-materials/

Content declaration

Product

Materials / chemical substances	kg/m^2	%	Post-consumer recycled material, weight-%	Biogenic material, weight-% and kg C/kg
Porcelain	15.17	76	0	0
Aluminum	4.48	23	0	0
Adhesive	0.25	1	0	0

Packaging

Materials / chemical substances	kg/m^2	%	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Wood	1.22	87	6	0.47
Cardboard	0.17	12	0.8	0.47
PE	0.014	1	0.07	0

Packaging

Distribution packaging: Wood pallet, cardboard and PE shrink wrap

Recycled material

Provenience of recycled materials (pre-consumer or post-consumer) in the product:
According to PPEC, cardboard packaging contains 81% post-consumer recycled materials

Biogenic carbon content

Biogenic carbon content, packaging 0.65 kg C/m^2

Environmental performance

The environmental performance results include the indicators and disclaimers of EN 15804:2012+A2:2019/AC:2021. The PCR requires that several parameters be reported in the EPD, including resource use, waste categories and output flows. 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, and discouraging the use of the results of modules A1-A3 (A1-A5 for services) without considering the results of module C.

Indicator name and abbreviation	Unit	Module													
Core environmental impact indicators		**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Climate Change - total	kg CO_2 eq.	1.89E+01	2.26E+00	2.88E+00	0	0	0	0	0	0	0	2.90E-01	4.06E-01	0	9.65E-01	0
Climate Change - fossil	kg CO_2 eq.	2.15E+01	2.26E+00	2.90E-01	0	0	0	0	0	0	0	2.90E-01	4.06E-01	0	9.26E-01	0
Climate Change - biogenic	kg CO_2 eq.	-2.63E+00	0	2.59E+00	0	0	0	0	0	0	0	5.42E-04	0	0	3.95E-02	0
Climate Change - LULUC	kg CO_2 eq.	6.91E-03	0	2.53E-05	0	0	0	0	0	0	0	2.52E-05	0	0	1.14E-04	0
GWP-GHG	kg CO_2 eq.	2.15E+01	2.26E+00	2.90E-01	0	0	0	0	0	0	0	2.90E-01	4.06E-01	0	9.26E-01	0
Ozone depletion	kg CFC-11 eq.	2.93E-09	5.72E-11	1.17E-12	0	0	0	0	0	0	0	1.16E-12	1.03E-11	0	1.08E-11	0
Acidification	Mole of H+ eq.	8.87E-02	1.53E-02	1.13E-03	0	0	0	0	0	0	0	1.12E-03	2.75E-03	0	4.94E-03	0
Eutrophication, freshwater	kg P eq.	2.34E-05	6.32E-07	1.02E-06	0	0	0	0	0	0	0	4.95E-07	1.13E-07	0	2.91E-06	0
Eutrophication, marine	kg N eq.	1.68E-02	5.97E-03	1.92E-04	0	0	0	0	0	0	0	1.92E-04	1.07E-03	0	1.30E-03	0
Eutrophication, terrestrial	mol N eq.	1.83E-01	6.52E-02	2.10E-03	0	0	0	0	0	0	0	2.09E-03	1.17E-02	0	1.43E-02	0
Photochemical ozone formation	kg NMVOC eq.	5.28E-02	1.76E-02	5.64E-04	0	0	0	0	0	0	0	5.57E-04	3.15E-03	0	3.91E-03	0
Abiotic depletion potential, minerals & metals[2]	kg Sb eq.	3.92E-06	0	8.67E-08	0	0	0	0	0	0	0	8.66E-08	0	0	1.65E-07	0
Abiotic depletion potential, fossil resources[2]	MJ	2.81E+02	2.84E+01	5.98E+00	0	0	0	0	0	0	0	5.97E+00	5.08E+00	0	1.39E+01	0
Water use[2]	m^3 world eq. deprived	3.13E+00	0	1.08E-01	0	0	0	0	0	0	0	1.08E-01	0	0	-5.62E-01	0
Additional environmental impact indicators		**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Particulate Matter emissions	Disease incidence	1.44E-06	4.90E-08	8.18E-09	0	0	0	0	0	0	0	7.71E-09	8.76E-09	0	6.62E-07	0
Ionizing radiation, human health[1]	kBq U235 eq.	5.70E-01	4.98E-19	8.26E-02	0	0	0	0	0	0	0	8.26E-02	8.96E-20	0	1.26E-02	0
Eco-toxicity (freshwater)[2]	CTUe	2.06E+02	1.20E+02	2.46E+00	0	0	0	0	0	0	0	2.37E+00	2.15E+01	0	9.11E+00	0
Human toxicity, cancer effects[2]	CTUh	8.31E-09	5.97E-10	1.43E-10	0	0	0	0	0	0	0	1.42E-10	1.07E-10	0	1.39E-09	0
Human toxicity, non-cancer effects[2]	CTUh	4.00E-07	5.62E-08	2.42E-09	0	0	0	0	0	0	0	2.36E-09	1.01E-08	0	6.97E-08	0
Land use related impacts/ Soil quality[2]	dimensionless	4.96E+01	0	1.38E+00	0	0	0	0	0	0	0	1.38E+00	0	0	6.87E-01	0
Indicators describing resource use		**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**

Use of renewable primary energy as energy carrier	MJ	8.57E+01	0	5.62E+00	0	0	0	0	0	0	0	5.62E+00	0	0	7.71E-01	0
Use of renewable primary energy resources used as raw materials	MJ	9.13E+00	0	-9.10E+00	0	0	0	0	0	0	0	4.10E-11	0	0	1.70E-11	0
Total use of renewable primary energy	MJ	9.48E+01	0	-3.48E+00	0	0	0	0	0	0	0	5.62E+00	0	0	7.71E-01	0
Use of non-renewable primary energy as energy carrier	MJ	2.82E+02	2.84E+01	6.08E+00	0	0	0	0	0	0	0	6.07E+00	5.08E+00	0	1.42E+01	0
Use of non-renewable primary energy resources used as raw materials	MJ	4.98E+00	0	1.35E-04	0	0	0	0	0	0	0	1.35E-04	0	0	5.47E-11	0
Total use of non-renewable primary energy resource	MJ	2.87E+02	2.84E+01	6.08E+00	0	0	0	0	0	0	0	6.07E+00	5.08E+00	0	1.42E+01	0
Secondary material	kg	1.35E-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Renewable secondary fuels	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-renewable secondary fuels	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net use of fresh water	m^3	2.61E-01	0	1.42E-02	0	0	0	0	0	0	0	1.42E-02	0	0	-1.31E-02	0
Environmental information describing waste categories		**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	6.35E-05	0	2.13E-09	0	0	0	0	0	0	0	2.10E-10	0	0	2.74E-06	0
Non-hazardous waste disposed	kg	4.66E+00	0	1.60E-02	0	0	0	0	0	0	0	2.16E-03	0	0	2.00E+01	0
Radioactive waste disposed	kg	5.98E-03	0	1.03E-03	0	0	0	0	0	0	0	1.03E-03	0	0	1.58E-04	0
Environmental information describing output flows		**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for reuse	kg	0	0	1.22E+00	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	1.70E-01	0	0	0	0	0	0	0	0	0	0	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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.
GWP-GHG = Global Warming Potential total excluding biogenic carbon. GWP-GHG indicator is similar to GWP-Total except that the characterisation factor (CF) for biogenic CO2 is set to zero.

Note: EN 15804 reference package based on EF 3.1

Option B was used for primary energy use indicators as per Annex 3 of PCR2019:14 Version 1.3.4.

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