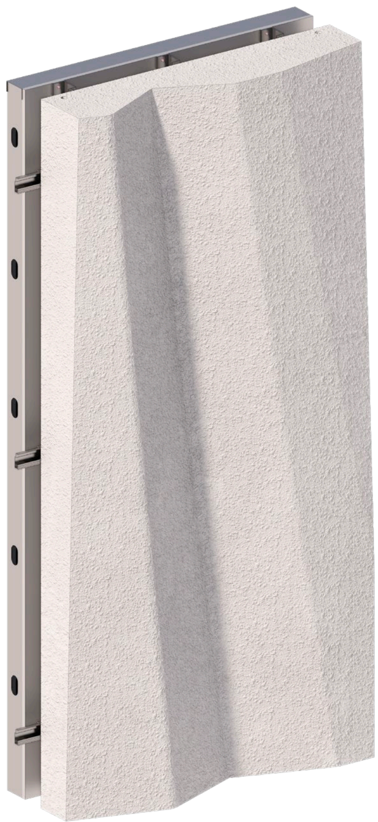
Environmental Product Declaration

BranchClad GFRC

MASS-CUSTOMIZED, VENTILATED RAINSCREEN SYSTEMS AND BESPOKE BUILDING SKINS
FINISHED WITH FIBER-REINFORCED CONCRETE



Branch's mass-customized cladding system enhances conventional, mass-produced, ventilated ra facade systems. A once flat cladding material is now dimensional offering a new level of design op Finished with GFRC, panels can ripple, wave, or undulate across the building to create a bespoke skin.

Branch TECHNOLOGY

Branch Technology enables architects, designers, and innovators to imagine, compose, and construct complex structures previously thought impossible using traditional construction means and methods. Through combining lean manufacturing, prefabrication methods, and software-driven robotics, Branch's patented process is called cellular fabrication, or C-Fab® for short. This process uses 20X less material than traditional means and methods of construction while providing significant energy-efficiency in its commercial façade assemblies.

CERTIFIED
ENVIRONMENTAL PRODUCT DECLARATION
UL.COM/EPD

Branch TECHNOLOGY

CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

BRANCHCLAD GFRC
VENTILATED RAINSCREEN FAÇADE SYSTEM

According to ISO 14025 and ISO 21930:2017

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL ENVIRONMENT 333 PFINGSTEN RD, NORTHBROOK, IL 60062 WWW.UL.COM WWW.SPOT.UL.COM
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	Program Operator Rules v 2.7 2022
MANUFACTURER NAME AND ADDRESS	Branch Technology 1530 Riverside Drive, Chattanooga, TN, 37046
DECLARATION NUMBER	4790500569.101.1
DECLARED UNIT	1 m^2 of cladding system (required) 100 ft^2 of cladding system (optional)
REFERENCE PCR AND VERSION NUMBER	Part A: Life Cycle Assessment Calculation Rules and Report Requirements (UL Environment, V3.2, 2018) Part B: Cladding Product Systems EPD Requirements (UL Environment, V2.0, 2021)
DESCRIPTION OF PRODUCT APPLICATION/USE	Ventilated rainscreen facade systems used on building exteriors
MARKETS OF APPLICABILITY	North America; Commercial, residential, industrial
DATE OF ISSUE	September 20, 2022
PERIOD OF VALIDITY	5 Years
EPD TYPE	Product-specific
EPD SCOPE	Cradle-to-gate with options (installation and end-of-life)
YEAR(S) OF REPORTED PRIMARY DATA	2021
LCA SOFTWARE & VERSION NUMBER	GaBi 10.6.135
LCI DATABASE(S) & VERSION NUMBER	GaBi Database Service Pack 2022.1
LCIA METHODOLOGY & VERSION NUMBER	TRACI 2.1, IPCC AR5

The sub-category PCR review was conducted by:	UL Environment PCR Review Panel epd@ul.com
This declaration was independently verified in accordance with ISO 14025: 2006. The UL Environment "Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report," v3.2 (December 2018), in conformance with ISO 21930:2017, serves as the core PCR, with additional considerations from the USGBC/UL Environment Part A Enhancement (2017) ☐ INTERNAL ☒ EXTERNAL	Cooper McCollum, UL Environment
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	WAP Sustainability Consulting
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	James Mellentine, Thrive ESG

LIMITATIONS

Environmental product declarations from different EPD programs (ISO 14025) may not be comparable.

Comparison of the environmental performance of Cladding Product Systems 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 building energy use phase.

Full conformance with this PCR allows EPD comparability only when all stages of a life cycle have been considered. See Section 3.10 for additional EPD comparability guidelines.

1. Product Definition and Information

1.1. Description of Company/Organization

Branch Technology is opening new design dimensions for building facades. Using their patented technology and cellular fabrication (C-Fab®) process, Branch Technology is enabling architects, built environment designers, and innovators to imagine, compose, and construct complex facade design structures previously thought impossible using traditional construction methods.

1.2. Product Description

Product Identification

Branch's mass-customized cladding system enhances conventional, mass-produced, ventilated rainscreen facade systems. A once flat cladding material is now dimensional offering a new level of design opportunity. Finished with GFRC, panels can ripple, wave, or undulate across the building to create a bespoke building skin.

The cutaway view (revealing the composite core and BranchMatrix™) and finished view of the finished BranchClad GFRC are shown below.

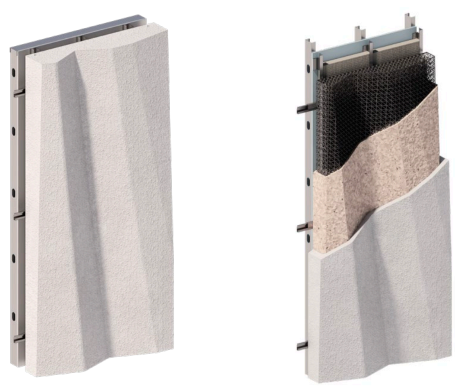


Figure 1: BranchClad GFRC

1.3. Application

BranchClad GFRC is a rainscreen façade system applied to building exteriors. It can be used in a variety of building applications, including commercial, residential, and industrial.

1.4. Material Composition

Table 1: Product composition

MATERIAL	BRANCHCLAD GFRC
Polymer-modified cementitious-based Coating	86%

Polyurethane (PU) Foam	7%
Acrylonitrile-butadiene-styrene (ABS) Polymer	4%
Pigment	2%
Stainless Steel	<1%
Aluminum	<1%
Total	100%

1.5. Properties of Declared Product as Delivered

BranchClad GFRC cladding systems arrive on site fully assembled and ready to install. They are packaged with a variety of packaging materials including cardboard sheets, cardboard corner protectors, plastic straps, plastic wrap, and pallets

2. Life Cycle Assessment Background Information

2.1. Declared Unit

The declared unit required by the PCR is 1 m^2 of cladding, with results also presented for 100 ft^2 of cladding.

Table 2: Declared unit properties

	VALUE	UNIT	OPTIONAL DECLARED UNIT	UNIT	STANDARD
Declared unit	1	m^2	100	ft^2	-
Mass	109	kg	222	lb	-
Conversion to 1 kg	0.00918	-	n/a	-	-
Thickness to achieve declared unit	178	mm	7	in	-
Density	612.4	kg/m^3	38.2	lbs/ft^3	-
Length	up to 1.22	m	up to 4.0	ft	-
Width	up to 3.05	m	up to 10.0	ft	-
Tensile strength	0.400	MPa	58.0	PSI	ASTM D-1623
U-value	0.109	W/m^2K	0.0192	$BTU/ft^2F\text{-}h$	ASTM C-518
R-value	9.2	m^2K/W	52.2	$ft^2F\text{-}h/BTU$	ASTM C-518

2.2. System Boundary

The type of EPD is cradle-to-gate with options. Included stages are summarized below.

Table 3: System boundary

MODULE NAME	DESCRIPTION	SUMMARY OF INCLUDED ELEMENTS
A1	Product Stage: Raw Material	Raw Material sourcing and processing as defined by secondary data.

	Supply	
A2	Product Stage: Transport	Shipping from supplier to manufacturing site. Fuel use requirements estimated based on product weights and estimated distance.
A3	Product Stage: Manufacturing	Energy, water and material inputs required for manufacturing products from raw materials. Packaging materials and manufacturing waste are included as well.
A4	Construction Process Stage: Transport	Shipping from manufacturing site to building site. Fuel use requirements estimated based on product weights and mapped distances.
A5	Construction Process Stage: Installation	Installation materials, installation waste, and packaging material waste.
C1	End-of-Life Stage: Deconstruction	Deconstruction materials and energy requirements
C2	End-of-Life Stage: Transport	Transport from building site to waste processing or disposal
C3	End-of-Life Stage: Waste Processing	Waste processing, including waste separation, recovery, incineration for energy recovery
C4	End-of-Life Stage: Disposal	Disposal of waste including pre-treatment and management of disposal site
	Excluded elements	*Capital goods and infrastructure flows*

2.3. Allocation

General principles of allocation were based on ISO 14040/44. There are no products other than the products under study that are produced as part of the manufacturing processes. No other products outside the subject products are produced at the facility and no allocation to other products was required.

To derive a per-unit value for manufacturing inputs such as electricity, nitrogen, waste, and water, allocation was first done on a cost accounting basis, then based on total production by area. As a default, secondary GaBi datasets use a physical basis for allocation.

Throughout the study recycled materials were accounted for via the cut-off method. Under this method, impacts and benefits associated with the previous life of a raw material from recycled stock are excluded from the system boundary. Additionally, impacts and benefits associated with secondary functions of materials at end of life are also excluded (i.e., production into a third life or energy generation from the incineration plant). The study does include the impacts associated with reprocessing and preparation of recycled materials that are part of the bill of materials of the products under study.

2.4. Cut-off Criteria

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

2.5. Data Sources

Primary data were collected by Branch Technology associates and from utility bills and was used for all manufacturing processes. Whenever available, supplier data was used for raw materials used in the production process. When supplier data did not exist, secondary data for raw material production was utilized from GaBi Database Version 2022.1.

2.6. Data Quality

Geographic Coverage

The geographical scope of the manufacturing portion of the life cycle is the United States. All primary data were collected from the manufacturer. The geographic coverage of primary data is considered excellent.

The geographical scope of the raw material acquisition is the United States. Customer distribution, site installation, and end-of-life of the life cycle is within the United States.

In selecting secondary data (i.e., GaBi Datasets), priority was given to the accuracy and representativeness of the data. When available and deemed of significant quality, country-specific data were used. However, priority was given to technological relevance and accuracy in selecting secondary data. This often led to the substitution of regional and/or global data for country-specific data. Overall geographic data quality is considered good.

Time Coverage

Primary data were provided by the manufacturer and represent all information for calendar year 2021. Using this data meets the PCR requirements. Time coverage of this primary data is considered excellent.

Data necessary to model cradle-to-gate unit processes were sourced from Sphera's GaBi LCI datasets. Time coverage of the GaBi datasets varies from approximately 2011 to present. All datasets rely on at least one 1-year average data. Overall time coverage of the datasets is considered good and meets the requirement of the PCR that all data be updated within a 10-year period.

Technological Coverage

Primary data provided by the manufacturer are specific to the technology the company uses in manufacturing their product. It is site-specific and considered of good quality. Sub-metering would improve the technological coverage of data quality.

Data necessary to model cradle-to-gate unit processes were sourced from GaBi LCI datasets. Technological coverage of the datasets is considered good relative to the actual supply chain of the manufacturer. While improved life cycle data from suppliers would improve technological coverage, the use of lower-quality generic datasets does meet the goal of this LCA.

Completeness

The data included is consider complete. The LCA model included all known material and energy flows.

2.7. Period under Review

The period under review is calendar year 2021.

2.8. Estimates and Assumptions

Throughout this study, value choices and judgements that may have affected the LCA have been described. Additional decisions are summarized below:

- The inclusion of cost-adjusted energy data was determined appropriate due to the inability to sub-meter and isolate manufacturing energy from overhead energy.
- Transport from point of purchase to the building site and from the building site to waste processing follows the default assumptions specified by the PCR.

- The use and selection of secondary datasets from GaBi – The selection of which generic dataset to use to represent an aspect of a supply chain is a significant value choice. Collaboration between the LCA practitioner, the manufacturer, and GaBi data experts was invaluable in determining best-case scenarios in the selection of data. However, no generic data can be a perfect fit. Improved supply chain specific data would improve the accuracy of results, however budgetary and time constraints also must be considered.
- Although supplier-specific data were used where available and proxy datasets were chosen using the best information available, including supplier-specific SDSs, more supplier-specific LCA data would have improved the technological accuracy of some datasets for raw materials inputs, such as ABS and PU foam.

3. Life Cycle Assessment Scenarios

3.1. Manufacturing

Branch products are manufactured via a digital pre-fabrication process in Chattanooga, Tennessee. The process begins with transforming architect-approved project designs from digital concept into 3D-printable models for parts via digital production. A 3D Printer uses these digital part files to print a 3D matrix. The matrix structure is then filled with foam insulation to create the composite core. After foaming, the composite core is milled down to the specific design specifications per the digital design. The structures are finished by hand using cement-based coating and other additional components. The BranchClad manufacturing process is summarized below.

Figure 2: Manufacturing Process Diagram

3.2. Transport & Installation

Table 4. Transport to the building site (A4)

NAME	VALUE	UNIT
Fuel type	Diesel	
Liters of fuel	42	l/100km
Vehicle type	Heavy duty truck/ 53,333 lb payload	
Transport distance	500	km
Capacity utilization (including empty runs, mass based	67	%
Weight of products transported (if gross density not reported)	127	kg
Volume of products transported (if gross density not reported)	0.178	m^3
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed	1	-

or nested packaging products)		

Note: Fuel efficiency has been scaled based on the mass of the functional unit.

Installation is assumed to be manual, per Part B PCR, requiring no energy. No wastage of materials occurs during installation of Branch products as they are bespoke for each building.

Table 5. Installation into the building (A5)

NAME	VALUE	UNIT
Ancillary materials	-	kg
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	-	m^3
Other resources	-	kg
Electricity consumption	-	kWh
Other energy carriers	-	MJ
Product loss per functional unit	-	kg
Waste materials at the construction site before waste processing, generated by product installation	12.9	kg
Packaging Waste to Landfill	6.57	kg
Packaging Waste to Incineration	1.64	kg
Packaging Waste to Recycling	4.70	kg
Biogenic carbon contained in packaging	7.20	kg CO_2
Direct emissions to ambient air, soil and water	-	kg
VOC content	n/a	$\mu g/m^3$

3.3. End of Life

Table 6. End of life (C1-C4)

NAME		VALUE	UNIT
Assumptions for scenario development (description of deconstruction, collection, recovery, disposal method and transportation)		As per PCR Part B, the deconstruction of the product is manual. The deconstructed product is collected with mixed construction waste and transported 100 km. As required by the PCR Par A, the waste classification is based on the RCRA for North American region, and the non-metal waste is 100% landfilled.	
Collection process (specified by type)	Collected with mixed construction waste	108	kg
Recovery (specified by type)	Landfill	108	kg
Disposal (specified by type)	Product or material for final deposition	108	kg

4. Life Cycle Assessment Results

Table 7. Description of the system boundary modules

	PRODUCT STAGE			CONSTRUCT-ION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE 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 from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Building Operational Energy Use During Product Use	Building Operational Water Use During Product Use	Deconstruction	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling Potential
EPD Type	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	ND

4.1. Life Cycle Impact Assessment Results

Table 8: IPCC AR5 + TRACI Impact Assessment Results, per 1 m²

TRACI v2.1, IPCC AR5	A1-A3	A4	A5	C1	C2	C3	C4
GWP 100 [kg CO_2 eq]	2.34E+02	4.93E+00	4.69E+00	-	2.27E+00	-	4.61E+00
ODP [kg CFC-11 eq]	8.84E-07	9.20E-15	1.18E-14	-	4.25E-15	-	1.45E-13
AP [kg SO_2 eq]	6.68E-01	2.26E-02	5.28E-03	-	6.34E-03	-	1.97E-02
EP [kg N eq]	4.51E-02	2.01E-03	2.11E-03	-	6.68E-04	-	2.86E-02
Resources [MJ]	4.11E+02	9.07E+00	1.20E+00	-	4.19E+00	-	8.74E+00

SFP [kg O_3 eq]	1.01E+01	5.23E-01	5.35E-02	-	1.45E-01	-	3.47E-01

Table 9: IPCC AR5 + TRACI Impact Assessment Results, per 100 ft²

TRACI v2.1, IPCC AR5	A1-A3	A4	A5	C1	C2	C3	C4
GWP 100 [kg CO_2 eq]	2.17E+03	4.58E+01	4.35E+01	-	2.11E+01	-	4.28E+01
ODP [kg CFC-11 eq]	8.21E-06	8.55E-14	1.10E-13	-	3.95E-14	-	1.35E-12
AP [kg SO_2 eq]	6.20E+00	2.10E-01	4.91E-02	-	5.89E-02	-	1.83E-01
EP [kg N eq]	4.19E-01	1.87E-02	1.96E-02	-	6.20E-03	-	2.66E-01
Resources [MJ]	3.82E+03	8.42E+01	1.12E+01	-	3.89E+01	-	8.12E+01
SFP [kg O_3 eq]	9.42E+01	4.86E+00	4.97E-01	-	1.34E+00	-	3.22E+00

Comparability: 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. 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.

4.2. Life Cycle Inventory Results

Table 10: Resource use, per 1 m²

PARAMETER	A1-A3	A4	A5	C1	C2	C3	C4
RPRE [MJ]	3.57E+02	2.66E+00	6.40E-01	-	1.23E+00	-	6.48E+00
RPRM [MJ]	6.81E+01	-	-	-	-	-	-
RPRT [MJ]	4.25E+02	2.66E+00	6.40E-01	-	1.23E+00	-	6.48E+00
NRPRE [MJ]	2.84E+03	6.85E+01	9.70E+00	-	3.16E+01	-	6.91E+01
NRPRM [MJ]	1.15E+03	-	-	-	-	-	-
NRPRT [MJ]	3.98E+03	6.85E+01	9.70E+00	-	3.16E+01	-	6.91E+01
SM [kg]	7.14E+00	-	-	-	-	-	-
RSF [MJ]	8.43E-06	-	-	-	-	-	-
NRSF [MJ]	1.07E-04	-	-	-	-	-	-
RE [MJ]	-	-	-	-	-	-	-
FW [m^3]	9.46E-01	9.57E-03	8.27E-03	-	4.42E-03	-	9.92E-03

Table 11: Resource use, per 100 ft²

PARAMETER	A1-A3	A4	A5	C1	C2	C3	C4
RPRE [MJ, LHV]	3.31E+03	2.47E+01	5.94E+00	-	1.14E+01	-	6.02E+01
RPRM [MJ, LHV]	6.32E+02	-	-	-	-	-	-

PARAMETER	A1-A3	A4	A5	C1	C2	C3	C4
RPRT [MJ, LHV]	3.94E+03	2.47E+01	5.94E+00	-	1.14E+01	-	6.02E+01
NRPRE [MJ, LHV]	2.64E+04	6.36E+02	9.02E+01	-	2.94E+02	-	6.42E+02
NRPRM [MJ, LHV]	1.07E+04	-	-	-	-	-	-
NRPRT [MJ, LHV]	3.70E+04	6.36E+02	9.02E+01	-	2.94E+02	-	6.42E+02
SM [kg]	6.63E+01	-	-	-	-	-	-
RSF [MJ, LHV]	7.83E-05	-	-	-	-	-	-
NRSF [MJ, LHV]	9.93E-04	-	-	-	-	-	-
RE [MJ, LHV]	-	-	-	-	-	-	-
FW [m^3]	8.79E+00	8.89E-02	7.68E-02	-	4.11E-02	-	9.22E-02

Table 12: Output Flows and Waste Categories, per 1 m^2

PARAMETER	A1-A3	A4	A5	C1	C2	C3	C4
HWD [kg]	3.49E-04	2.85E-10	2.62E-10	-	1.32E-10	-	2.59E-09
NHWD [kg]	8.24E+01	5.89E-03	6.66E+00	-	2.72E-03	-	1.07E+02
HLRW [kg]	1.90E-04	2.25E-07	9.35E-08	-	1.04E-07	-	6.91E-07
ILLRW [kg]	1.57E-01	1.90E-04	8.05E-05	-	8.76E-05	-	6.06E-04
CRU [kg]	-	-	-	-	-	-	-
MR [kg]	6.10E-01	-	4.70E+00	-	-	7.47E-01	-
MER [kg]	-	-	-	-	-	-	-
EEE [MJ]	-	-	8.41E+00	-	-	-	-
EET [MJ]	-	-	3.33E+00	-	-	-	-

Table 13: Output Flows and Waste Categories, per 100 ft^2

PARAMETER	A1-A3	A4	A5	C1	C2	C3	C4
HWD [kg]	3.24E-03	2.64E-09	2.44E-09	-	1.22E-09	-	2.41E-08
NHWD [kg]	7.66E+02	5.47E-02	6.19E+01	-	2.53E-02	-	9.98E+02
HLRW [kg]	1.77E-03	2.09E-06	8.69E-07	-	9.66E-07	-	6.42E-06
ILLRW [kg]	1.46E+00	1.76E-03	7.48E-04	-	8.14E-04	-	5.63E-03
CRU [kg]	-	-	-	-	-	-	-
MR [kg]	5.67E+00	-	4.37E+01	-	-	6.94E+00	-
MER [kg]	-	-	-	-	-	-	-
EEE [MJ]	-	-	7.81E+01	-	-	-	-
EET [MJ]	-	-	3.09E+01	-	-	-	-

Table 14: Carbon emissions and removals, per 1 m²

PARAMETER	A1-A3	A4	A5	C1	C2	C3	C4
BCRP [kg CO_2]	-	-	-	-	-	-	-
BCEP [kg CO_2]	-	-	-	-	-	-	-
BCRK [kg CO_2]	7.20E+00	-	-	-	-	-	-
BCEK [kg CO_2]	-	-	6.91E+00	-	-	-	-
BCEW [kg CO_2]	-	-	-	-	-	-	-
CCE [kg CO_2]	-	-	-	-	-	-	-
CCR [kg CO_2]	-	-	-	-	-	-	-
CWNR [kg CO_2]	-	-	-	-	-	-	-

Table 15: Carbon emissions and removals, per 100 ft²

PARAMETER	A1-A3	A4	A5	C1	C2	C3	C4
BCRP [kg CO_2]	-	-	-	-	-	-	-
BCEP [kg CO_2]	-	-	-	-	-	-	-
BCRK [kg CO_2]	6.69E+01	-	-	-	-	-	-
BCEK [kg CO_2]	-	-	6.42E+01	-	-	-	-
BCEW [kg CO_2]	-	-	-	-	-	-	-
CCE [kg CO_2]	-	-	-	-	-	-	-
CCR [kg CO_2]	-	-	-	-	-	-	-
CWNR [kg CO_2]	-	-	-	-	-	-	-

5. LCA Interpretation

In the life cycle for BranchClad GFRC, production (A1-A3) dominates environmental impacts. The main raw materials ABS and PU foam, are the most significant contributors. The next greatest contributor is the electricity used during manufacturing. EP shows higher impacts within disposal (C4) due to the leachate treatment associated with landfills.

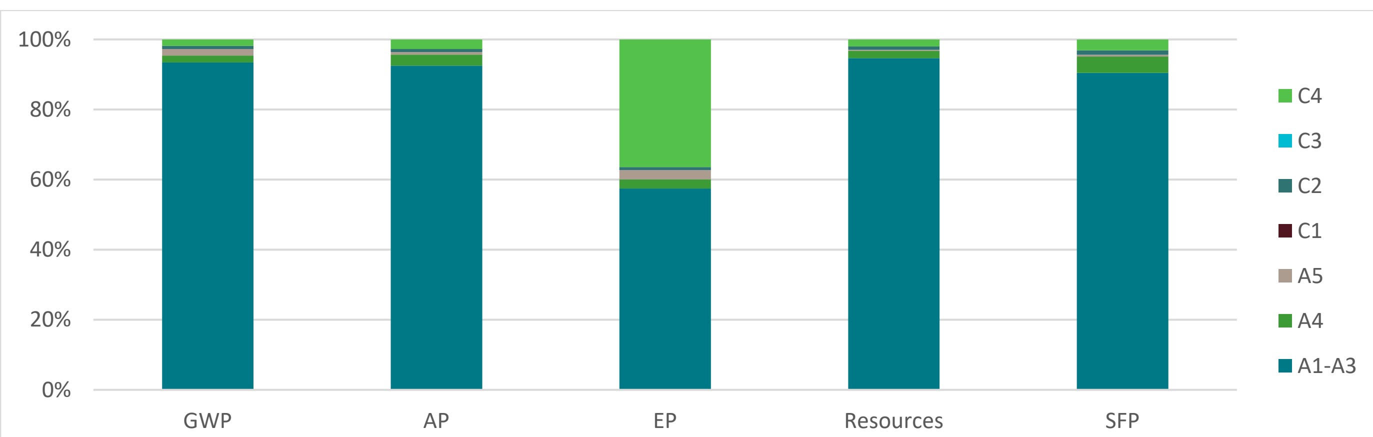


Figure 3: Relative LCIA results by life cycle stage

6. Additional Environmental Information

6.1 Environment and Health During Manufacturing

During the manufacturing process, Branch Technology employees wear personal protective equipment: safety glasses and/or face shields, hearing protection, respirators, gloves, Tyvek coveralls, and dust masks. These materials were excluded from the LCA as they fall below the cut-off criteria.

In the manufacturing facility, the main HVAC units maintain 72°F and 50% RH in all spaces. Scrubbers in milling and foaming remove excess dust and VOCs, respectively, and exhaust fans in foaming ensure adequate fresh air changeover in that space. All units are maintained according to manufacturer recommendations per the application each serves.

An industrial hygiene assessment of Branch Technology's manufacturing facility concluded that dust-related emissions and sound exposure were less than applicable legal and recommended health standards.

6.2 Environment and Health During Installation

During installation, any safety measures are at the discretion and guidance of the contractor on site.

7. References

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