



## BioEdge® Edgebanding

BioEdge® Edgebanding is a bio-based product solution eliminating the use of oil and harmful chemicals. It's a complete bio-replacement for PVC and ABS edgebanding. BioEdge Edgebanding is formulated from BioBest®, a patented, proprietary plastic polymer made from corn. BioEdge Edgebanding is produced with 83% or greater of a proprietary PLA blend, quickly making it the leading "green" solution in the industry and number one choice for green building projects.



### Performance dashboard

#### Features & functionality

BioEdge is the bio-based alternative to PVC/ABS/PP

PVC/ABS/PP are not "green". BioEdge PLA blend is the only base material to pass Cradle to Cradle certification

Architects/installers/furniture companies can incorporate BioEdge directly into their current processes

Up to 5x less green house gas emission during production of the base material

Visit [Bio-Plastic Solutions](#) for more product information

[BioEdge® Edgebanding](#)

#### Environment & materials

Improved by:

World's only plant and bio-based edgebanding

Biodegradable on it's own given the right circumstances

No expertise or added equipment needed

Base material is byproduct of food stream production and does not take away from that stream

Certifications & rating systems:

Environmental product declaration (EPD)

Health Product Declaration (HPD)

C2C Certified™ (for PLA polymer)

C2C Material Health Certificate (for PLA polymer)

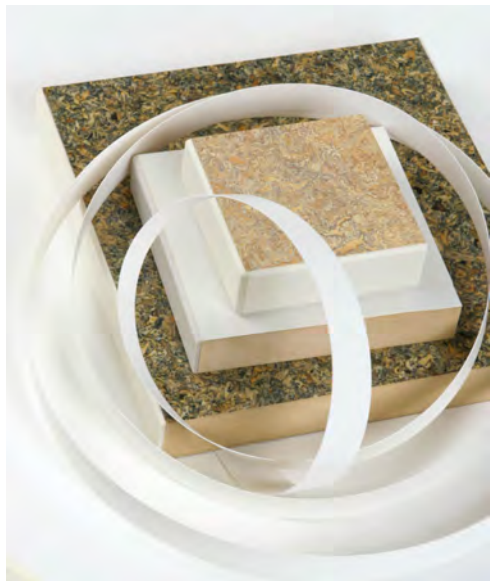
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[Technical Data Sheet](#)

For spec help, [contact us](#) or call 507-583-0097

[See LCA, interpretation & rating systems](#)

[See materials, interpretation & rating systems](#)



## SM Transparency Report (EPD)™ + Material Health Overview™

#### VERIFICATION

3rd party verified



Transparency Report (EPD)

3rd party verified



Material evaluation

Self-declared



Validity: 2022/02/03 – 2027/02/03  
BPS – 20220314 – 001

#### LCA

This environmental product declaration (EPD) was independently verified by Harmony Environmental, LLC to the the BIFMA PCR for Office Furniture Workspace Products and ISO 14044.

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(913) 780-3328



#### SUMMARY

##### Reference PCR

BIFMA PCR for Office Furniture Workspace Products: UNCPC 3814

Regions; system boundaries  
North America; Cradle to grave

Functional unit / reference service life:  
1 m<sup>2</sup> of floor space; 10 years

LCIA methodology: TRACI 2.1

LCA software; LCI database  
SimaPro Analyst 9.2  
EcoInvent 3.7

LCA conducted by: Sustainable Minds

##### Public LCA:

Life Cycle Assessment of BioEdge® Edgebanding for BioPlastic Solutions

#### Bio-Plastic Solutions

4004 Highway 30 West  
Ellendale, MN 56026  
[www.bioplasticsolutions.com](http://www.bioplasticsolutions.com)  
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Contact us

## LCA & material health results & interpretation

BioEdge® Edgebanding

Life cycle assessment

Material health

### Scope and summary

Cradle to gate  Cradle to gate with options  Cradle to grave

#### Application

Bioplastic Solutions designs and manufactures BioEdge®. It is a furniture/casework product which seals exposed and raw edges and is made primarily with bio-based materials (a byproduct of corn or sugarcane production). It is a competitively priced alternative to petro-chemical based plastics.

#### Product description

Three different reference products have been considered in this LCA study: table, kitchenette, and classroom cabinet. For the purpose of satisfying the PCR categories, the table is considered benching while kitchenette and classroom cabinet are considered panels in addition with other office components. The reference flows used in this LCA is to support 4 occupants for table and kitchenette, while classroom cabinet supports 6 occupants. The data reported is based on 1 m<sup>2</sup> of floorspace.

Table



Kitchenette



Classroom cabinet



#### Functional unit

**Functional unit is one square meter of workspace for a period of 10 years.**

BioEdge® has been and can be a component of furniture that meets ANSI/BIFMA X5.5-2021 Desk/Table Products. [Per technical data sheet](#), if all guidelines for installation and application of hot melt adhesives to the edging are followed correctly, BioEdge® will remain on the unit permanently and warranty will be extended to the same timeframe as the end unit.

**Reference products:** Table, Kitchenette, and Classroom cabinet

**Physical floorspace reported:** 0.785 m<sup>2</sup> for Table, 2.229 – 5.574 m<sup>2</sup> for Kitchenette, and 4.645 - 6.968 m<sup>2</sup> for Classroom cabinet

**Reference flows:** 0.425 lb for Table, 2.45 lb for Kitchenette, and 1.90 lb for Classroom cabinet

**Functional units needed:** 1.274 for Table, 0.179 - 0.449 for Kitchenette, 0.144 - 0.215 for Classroom cabinet

#### Manufacturing data

**Reporting period:** Oct. 2020 – Sep. 2021 for energy data and July 2020 – June 2021 for non-energy data

**Location:** Ellendale, MN

### What's causing the greatest impacts

#### All life cycle stages

**Raw material acquisition and transport stages (A1-A2) dominate the results for most impact categories followed by manufacturing (A3), and installation stage (A5).** Together A1-A4 contribute to most of the impacts across the life cycle. A1-A2 stage contributes to ~50% of the total impacts in most of the impact categories except non-carcinogenics and respiratory effects. In case of non-carcinogenics impact, A1-A2 stage has negative contribution which means this stage absorbs more toxic chemicals from the environment than it releases. PLA polymer, a major ingredient for BioEdge, is responsible for this negative value. Manufacturing (A3) stage contributes to much of the non-carcinogenics. Impacts from the installation stage (A5) is mostly due to the hot-melt adhesives.

#### Raw material acquisition and transport stage

**Within A1-A2 stage, raw material acquisition stage (A1) is the main contributor,** with less impacts coming from raw material transport (A2) stage. Raw material extraction and processing for PLA polymer, a major ingredient in BioEdge® contributes to majority of the impacts in A1 stage.

#### Manufacturing stage

**Electricity used during production contributes to almost all of the manufacturing (A3) impacts.** Corrugated cardboard used for packaging and distribution also makes considerable impacts.

#### Sensitivity analysis

**For this LCA study, only input that needed allocation was electricity used during manufacturing, while proxy data was used for two input materials.** A sensitivity analysis was performed using a range from half to twice the manufacturing electricity input and raw material inputs for those two materials. Total impact results for all impact categories but ecotoxicity and eutrophication have variations greater than 10%.

#### Material composition greater than 1% by weight

FLOW	MASS PERCENTAGE	MASS PER FUNCTIONAL UNIT (Kg/m <sup>2</sup> )		
		Table	Kitchenette	Classroom cabinet
PLA polymer	76.09%	0.147	0.846	0.656
Masterbatch	6.92%	0.013	0.077	0.060
Talc	5.19%	0.010	0.058	0.045
Colorant	3.46%	0.007	0.038	0.030
Primer	3.25%	0.006	0.036	0.028
Wood Packaging	2.70%	0.005	0.030	0.023
Cardboard packaging	1.45%	0.003	0.016	0.012
Acetone thinner	0.69%	0.001	0.008	0.006



Data represents a mix of primary data from BioPlastic Solutions on the production of BioEdge (gate-to-gate) and their polylactic acid (PLA) supplier, and background data from SimaPro databases. The quality is considered to be high and representative of the described systems. Data for material processing and product manufacturing were collected in a consistent manner and were checked for plausibility of inputs and outputs.







### Total impacts by life cycle stages [mPts/per pound of BioEdge]



BioPlastic Solutions is continuing the process of moving to a zero scrap policy by investigating use of scrap as reprocessed material back into BioEdge®. Packaging for raw materials is re-used to ship back out products on our other product lines. Masterbatch mixing has allowed us to more accurately use the correct amount of material for each job. New ERP program will further simplify accuracy on raw material mixes and leaving less in the barrel for each job to be purged.

[See how we make it greener](#)

## LCA results

LIFE CYCLE STAGE	A1-A2 RAW MATERIAL ACQUISITION AND TRANSPORT	A3 MANUFACTURING	A4 TRANSPORTATION	A5 INSTALLATION	B1-B7 USE AND MAINTENANCE	C1-C4 END OF LIFE
<b>Information modules: Included</b> Stages B1, B3-B7, C1, C3, and D are not applicable.	<b>A1 Raw Materials</b>	<b>A1 Manufacturing</b>	<b>A4 Transportation/Delivery</b>	<b>A5 Installation</b>	B1 Use	C1 Deconstruction
	<b>A2 Transportation</b>				<b>B2 Maintenance</b>	<b>C2 Waste Transport</b>
					B3 Repair	C3 Waste Processing
					B4 Replacement	<b>C4 Disposal</b>
					B5 Refurbishment	
					B6 Operational energy use	
					B7 Operational water use	
						

## SM 2013 [Learn about SM Single Score results](#)

<b>Impacts of 1 pound of BioEdge per 10 years of service</b>	<b>9.47E-02 mPts</b>	<b>5.86E-02 mPts</b>	<b>5.61E-03 mPts</b>	<b>2.05E-02 mPts</b>	<b>2.56E-02 mPts</b>	<b>8.87E-03 mPts</b>
<b>Materials or processes contributing &gt;20% to total impacts in each life cycle stage</b>	PLA raw materials and production.	Electricity consumed during BioEdge manufacturing.	Truck and rail transportation used to transport product to building site.	Hot-melt adhesives used for installation	Cleaning agent for periodic cleaning.	Disposal process after the end-of-life.

**Table: TRACI v2.1 results per functional unit**

LIFE CYCLE STAGE	A1-A2 RAW MATERIAL ACQUISITION AND TRANSPORT	A3 MANUFACTURING	A4 TRANSPORTATION	A5 INSTALLATION	B1-B7 USE AND MAINTENANCE	C1-C4 END OF LIFE
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**Ecological damage**

Impact category	Unit							
Acidification	kg SO <sub>2</sub> eq	?	2.34E-03	1.26E-03	6.40E-05	4.85E-04	1.90E-04	2.95E-05
Eutrophication	kg N eq	?	2.79E-03	5.66E-04	1.34E-05	2.51E-04	1.99E-03	2.58E-05
Global warming - IPCC (Embodied Carbon)	kg CO <sub>2</sub> eq	?	5.52E-01	3.54E-01	3.67E-02	1.19E-01	5.88E-02	1.07E-01
Ozone depletion	kg CFC-11 eq	?	6.50E-08	9.83E-09	8.78E-09	1.12E-08	3.31E-09	6.04E-10

**Human health damage**

Impact category	Unit							
Carcinogenics	CTU <sub>h</sub>	?	3.51E-09	2.80E-09	3.36E-11	1.44E-09	6.03E-10	4.93E-10
Non-carcinogenics	CTU <sub>h</sub>	?	-3.88E-08	3.78E-08	5.15E-09	5.16E-09	1.38E-09	2.87E-09
Respiratory effects	kg PM <sub>2.5</sub> eq	?	3.05E-04	1.68E-03	1.29E-05	1.46E-04	4.48E-05	2.32E-06
Smog	kg O <sub>3</sub> eq	?	2.55E-02	1.14E-02	8.22E-04	5.78E-03	2.27E-03	8.04E-04

**Additional environmental information**

Impact category	Unit							
Fossil fuel depletion	MJ, LHV	?	1.11E+00	1.73E-01	7.78E-02	1.80E-01	1.89E-02	5.73E-03
Global warming -20a (IPCC)	kg CO <sub>2</sub> eq	?	8.95E-01	3.86E-01	3.75E-02	1.57E-01	6.85E-02	1.28E-01
Ecotoxicity	CTU <sub>e</sub>	?	1.05E+00	1.22E-01	1.04E-01	1.15E-01	2.19E-01	1.28E-01

**Kitchenette: TRACI v2.1 results per functional unit**

LIFE CYCLE STAGE	A1-A2 RAW MATERIAL ACQUISITION AND TRANSPORT	A3 MANUFACTURING	A4 TRANSPORTATION	A5 INSTALLATION	B1-B7 USE AND MAINTENANCE	C1-C4 END OF LIFE
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**Ecological damage**

Impact category	Unit							
Acidification	kg SO <sub>2</sub> eq	?	1.35E-02	7.24E-03	3.69E-04	2.80E-03	1.09E-03	1.70E-04
Eutrophication	kg N eq	?	1.61E-02	3.26E-03	7.72E-05	1.45E-03	1.15E-02	1.49E-04
Global warming - IPCC (Embodied Carbon)	kg CO <sub>2</sub> eq	?	3.18E+00	2.04E+00	2.12E-01	6.85E-01	3.39E-01	6.19E-01
Ozone depletion	kg CFC-11 eq	?	3.75E-07	5.67E-08	5.06E-08	6.48E-08	1.91E-08	3.48E-09

**Human health damage**

Impact category	Unit							
Carcinogenics	CTU <sub>h</sub>	?	2.02E-08	1.61E-08	1.93E-10	8.31E-09	3.48E-09	2.84E-09
Non-carcinogenics	CTU <sub>h</sub>	?	-2.24E-07	2.18E-07	2.97E-08	2.98E-08	7.97E-09	1.65E-08
Respiratory effects	kg PM <sub>2.5</sub> eq	?	1.76E-03	9.66E-03	7.43E-05	8.44E-04	2.58E-04	1.34E-05
Smog	kg O <sub>3</sub> eq	?	1.47E-01	6.58E-02	4.74E-03	3.33E-02	1.31E-02	4.63E-03

**Additional environmental information**

Impact category	Unit							
Fossil fuel depletion	MJ, LHV	?	6.41E+00	9.95E-01	4.49E-01	1.04E+00	1.09E-01	3.30E-02
Global warming -20a (IPCC)	kg CO <sub>2</sub> eq	?	5.16E+00	2.23E+00	2.16E-01	9.07E-01	3.95E-01	7.39E-01
Ecotoxicity	CTU <sub>e</sub>	?	6.03E+00	7.04E-01	6.01E-01	6.61E-01	1.26E+00	7.37E-01

# Classroom cabinet: TRACI v2.1 results per functional unit

LIFE CYCLE STAGE	A1-A2 RAW MATERIAL ACQUISITION AND TRANSPORT	A3 MANUFACTURING	A4 TRANSPORTATION	A5 INSTALLATION	B1-B7 USE AND MAINTENANCE	C1-C4 END OF LIFE
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## Ecological damage

Impact category	Unit							
Acidification	kg SO <sub>2</sub> eq	?	1.05E-02	5.62E-03	2.86E-04	2.17E-03	8.49E-04	1.32E-04
Eutrophication	kg N eq	?	1.25E-02	2.53E-03	5.98E-05	1.12E-03	8.91E-03	1.15E-04
Global warming - IPCC (Embodied Carbon)	kg CO <sub>2</sub> eq	?	2.47E+00	1.58E+00	1.64E-01	5.31E-01	2.63E-01	4.80E-01
Ozone depletion	kg CFC-11 eq	?	2.91E-07	4.40E-08	3.93E-08	5.03E-08	1.48E-08	2.70E-09

## Human health damage

Impact category	Unit							
Carcinogenics	CTU <sub>h</sub>	?	1.57E-08	1.25E-08	1.50E-10	6.45E-09	2.70E-09	2.20E-09
Non-carcinogenics	CTU <sub>h</sub>	?	-1.73E-07	1.69E-07	2.30E-08	2.31E-08	6.18E-09	1.28E-08
Respiratory effects	kg PM <sub>2.5</sub> eq	?	1.36E-03	7.49E-03	5.76E-05	6.54E-04	2.00E-04	1.04E-05
Smog	kg O <sub>3</sub> eq	?	1.14E-01	5.10E-02	3.68E-03	2.58E-02	1.01E-02	3.59E-03

## Additional environmental information

Impact category	Unit							
Fossil fuel depletion	MJ, LHV	?	4.97E+00	7.72E-01	3.48E-01	8.05E-01	8.43E-02	2.56E-02
Global warming -20a (IPCC)	kg CO <sub>2</sub> eq	?	4.00E+00	1.73E+00	1.68E-01	7.03E-01	3.06E-01	5.73E-01
Ecotoxicity	CTU <sub>e</sub>	?	4.68E+00	5.46E-01	4.66E-01	5.13E-01	9.80E-01	5.73E-01

See the additional content required by the BIFMA PCR on page 4 of the [Transparency Report PDF](#).

## References

### LCA Background Report

BioEdge® Edgebanding LCA Background Report (public version), BioPlastic Solutions 2021. SimaPro Analyst 9.2, Ecolnvent 3.7 database.

### BIFMA PCR for Office Furniture Workspace Products: UNCPC 3814

Valid through July 31, 2022. PCR review conducted by Jack Geibig (chair, jgeibig@ecoform.com); Thomas Gloria, PhD (t.gloria@industrial-ecology.com); and Dr. Michael Overcash (mrovercash@earthlink.net).

**SM Transparency Reports (TR) are ISO 14025 Type III environmental declarations (EPD) that enable purchasers and users to compare the potential environmental performance of products on a life cycle basis.** Environmental declarations from different programs (ISO 14025) may not be comparable. They are designed to present information transparently to make the limitations of comparability more understandable. TRs/EPDs of products that conform to the same PCR and include the same life cycle stages, but are made by different manufacturers, may not sufficiently align to support direct comparisons. They therefore, cannot be used as comparative assertions unless the conditions defined in ISO 14025 Section 6.7.2. 'Requirements for Comparability' are satisfied. When attempting to compare EPDs or life cycle impacts of products from different companies, the user should be aware the uncertainty in the final results due to and not limited to the practitioner's assumptions, the source of the data used in the study, and the software tool used to conduct the study. Different LCA software and background LCI data sets may lead to different results upstream or downstream of the life cycle stages declared.

## Rating systems

The intent is to reward project teams for selecting products from manufacturers who have verified improved life-cycle environmental performance.

### LEED BD+C: New Construction | v4 - LEED v4

Building product disclosure and optimization

#### Environmental product declarations

- Industry-wide (generic) EPD ½ product
- Product-specific Type III EPD 1 product

### LEED BD+C: New Construction | v4.1 - LEED v4.1

Building product disclosure and optimization

#### Environmental product declarations

- Industry-wide (generic) EPD ½ product
- Product-specific Type III EPD 1 product

### Collaborative for High Performance Schools National Criteria

#### MW 7.1 – Environmental Product Declarations

- Third-party certified type III EPD 2 points

### BREEAM New Construction 2018

Mat 02 - Environmental impacts from construction products

#### Environmental Product Declarations (EPD)

- Industry average EPD .5 points
- Multi-product specific EPD .75 points
- Product specific EPD 1 point



## SM Transparency Report (EPD)™ + Material Health Overview™

### VERIFICATION

LCA

3rd party verified

Transparency Report (EPD)

3rd party verified

Material evaluation

Self-declared

Validity: 2022/02/03 – 2027/02/03  
BPS – 20220314 – 001

This environmental product declaration (EPD) was independently verified by Harmony Environmental, LLC to the the BIFMA PCR for Office Furniture Workspace Products and ISO 14044.

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### SUMMARY

#### Reference PCR

BIFMA PCR for Office Furniture Workspace Products: UNCPC 3814

#### Regions; system boundaries

North America; Cradle to grave

#### Functional unit / reference service life:

1 m<sup>2</sup> of floor space; 10 years

#### LCIA methodology: TRACI 2.1

#### LCA software; LCI database

SimaPro Analyst 9.2  
Ecolnvent 3.7

#### LCA conducted by: Sustainable Minds

#### Public LCA:

Life Cycle Assessment of BioEdge® Edgebanding for BioPlastic Solutions

### Bio-Plastic Solutions

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Contact us

# LCA & material health results & interpretation

BioEdge® Edgebanding

Life cycle assessment

**Material health**

## Assessment scope and results

### Health Product Declaration®

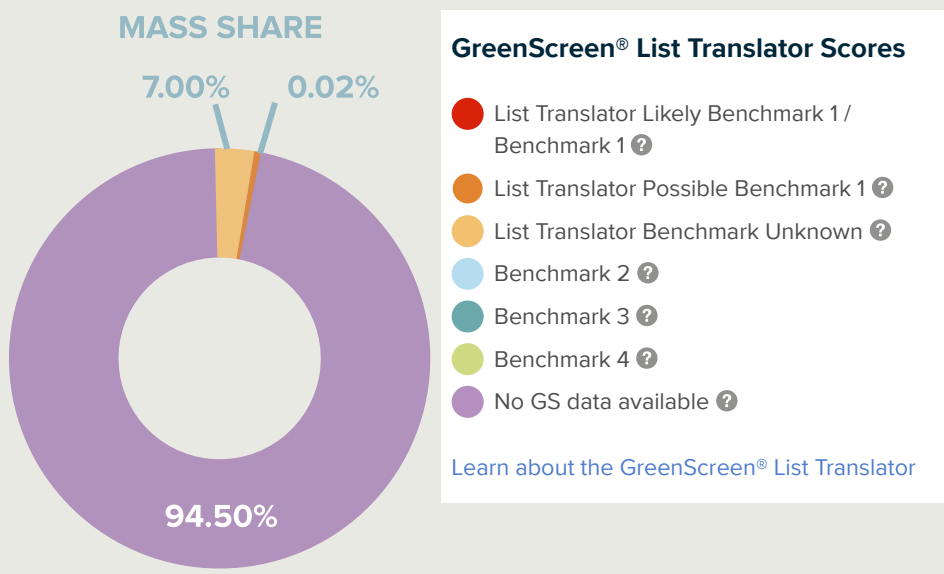
BioEdge

**Inventory threshold:** None

**Full disclosure known hazards:** Yes

**Based on the selected content inventory threshold:**

Characterized  Screened  Identified



### Total VOC Content

VOC Content data is not applicable for this product category.

## What's in this product and why

The only product ingredient with a BM-1 score is Talc. It is used as a processing agent in BioEdge to help stabilize the product as it is being run. It has food contact allowance from the FDA. As the PLA degrades after it's end life, the talc returns to the earth as a natural product, or put another way, dirt.

The user or humans in a building should not be concerned with any product that has BioEdge used on it. There is no off gassing of volatile chemicals and the talc contained within the product does not leech to the surface, it stays in the small percentage, where it cools in the product. There are no additives in BioEdge that can create hazards in the finished environment of a building. There is no danger of hazards being released in the finished environment when it is cleaned or in any other use of the finished product.

### How we're making it healthier

BioPlastic Solutions is currently considering a couple bio-based additives (to substitute Talc) to help with processing and increase the bio-content.

[See how we make it greener](#)

## The Health Product Declaration®

The HPD Open Standard provides a consistent, and transparent format to accurately disclose the material contents and associated hazard classifications for a building product.

### How it works

Material ingredients are screened and categorized according to the hazards that international governmental bodies and toxicology experts have associated with them, based on two listings:

- Authoritative lists maintained or recognized by government bodies
- Screening lists, which include chemicals that government bodies determined need further scrutiny, as well as chemical lists not recognized by any government body.

## References

**Health Product Declaration®**  
BioEdge

**Health Product Declaration Open Standard v2.2** The standard provides guidance to accurately disclose the material contents of a building product using a standard, consistent, and transparent format.

## Rating systems

### LEED BD+C: New Construction | v4 - LEED v4

Building product disclosure and optimization

#### Material Ingredients

Credit value options 1 product each

1. Reporting  2. Optimization  3. Supply Chain Optimization

### LEED BD+C: New Construction | v4.1 - LEED v4.1

Materials and resources

#### Material Ingredients

Credit value options 1 product each

1. Reporting  2. Optimization  3. Supply Chain Optimization

### Living Building Challenge

#### Materials petals imperatives

10. Red List Free  12. Responsible Industry  13. Living Economy Sourcing

### WELL Building Standard®

#### Air and Mind Features

X07 Materials Transparency

X08 Materials Optimization

### Collaborative for High Performance Schools National Criteria

#### MW 10.1 — Building Product Health Related Information Reporting

Product Health Related Information Report 1 point



## SM Transparency Report (EPD)™ + Material Health Overview™

### VERIFICATION

Material evaluation

Self-declared



Validity: 2021/08/13 – 2024/08/09  
HPD Unique Identifier: 25796

The material health evaluation is self-declared and done in accordance with the HPD Open Standard 2.2

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Contact us



## How we make it greener

## BioEdge® Edgebanding

[Collapse all](#)

### RAW MATERIAL ACQUISITION

**New masterbatch is mixed in the manufacturing plant in Minnesota versus previous supplier both being in different states.** Recycled content is expected to be implemented in the calendar year 2022.

Current packaging for raw materials is reused as packaging for other product lines. This reduces the packaging material inputs for product packaging.

BioPlastic Solutions is constantly testing out new additives to increase bio-content even further.



### MANUFACTURING

**BioEdge® is manufactured in Ellendale, MN.** The entire manufacturing building has been re-fitted with LED lighting, which has helped in reducing the overall energy consumption.

Significant amount of scrap is generated because of the processes for non-production time and equipment maintenance & improvements. BioPlastic Solutions is periodically revisiting the manufacturing processes to incorporate new technology considerations for further improvement which will reduce the overall scrap. In addition, BioPlastic Solutions is also planning to grind and reuse this scrap which will significantly reduce waste and reduce impacts from batch materials.

BioPlastic Solutions is also designing new inventory programs with larger customers to reduce startups and shutdowns by making larger production runs. This not only reduces the scrap but also reduces energy usage.



## TRANSPORTATION

To reduce impacts from transportation, BioPlastic Solutions performed a thorough review of product packaging materials in 2021. After the analysis, new, smaller telescoping boxes were chosen for product packaging. This helped to utilize less overall materials and reduced the empty space during product distribution.

New inventory programs have begun with our larger volume users in order to reduce the number of machine startups/shut downs and scrap. Along with this, there will be fewer small shipments via UPS and more large shipments via LTL with less empty space and packaging materials used.



## INSTALLATION

BioEdge® is designed to be installed by the use of edge banding machines and hot-melt adhesives. 5% of BioEdge is milled off the edges during installation. BioPlastic Solutions is working with installers to investigate on alternative options of installation that can help reduce the amount of waste generated during installation.



## USE

BioEdge® requires periodic cleaning. Bioplastic Solutions is always researching and testing new ways of efficient cleaning. Current research includes the comparison between water-based cleaning versus solvent based cleaners, primers, and glue.



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