



## Environmental Product Declaration

# Embody® Chair

### Design Story

Designed by Bill Stumpf and Jeff Weber

You feel the Pixelated Support™ of Embody the moment you sit down— a sense that you are floating, yet perfectly balanced. The seat distributes your weight evenly while supporting your body’s micro-movements. The narrow backrest allows you to move freely and naturally as it automatically adjusts to support a full range of seated postures. By reducing seated pressure and encouraging freedom of movement, Embody allows blood and oxygen to flow more freely, which helps keep you focused.

Form doesn’t just follow function with Embody. Function is on full display. The chair’s highly technical structures—such as the spine-like BackFit™, with its visible H-flexors—show how it bends to encourage seated movement. Embody is purposeful design that creates harmony between your mind and body, and between your body and work.



### Environmental Data

44% Recycled Content

40% Post Consumer

4% Pre Consumer

Up to 95% Recyclability\*

### Life Cycle Assessment Data

98 kg CO<sub>2</sub>eq Global Warming

0.29 kg SO<sub>2</sub>eq Acidification

0.10 kg Neq Eutrophication

4.0 kg O<sub>3</sub>eq Smog

1600 MJ Primary Energy Demand

3.2 X 10<sup>7</sup> kg CFC-11eq Ozone Depletion

### Environmental Certifications

GREENGUARD Certified

GREENGUARD GOLD Certified

BIFMA level™ 3

Global GreenTag (CM) Certified™ Greenrate level A

### Warranty

Backed by Herman Miller’s

12-year, 24/7 warranty

### Manufactured

Herman Miller Greenhouse, Holland, MI 49424

ISO 14001/OHSAS 18001

Greenhouse manufacturing facility uses 100% Renewable Electric Energy (through the purchase of Renewable Energy Certificates)

### Disclaimer

The PCR this EPD was based on was not written to support comparative assertions. EPDs based on different PCRs or different calculation models may not be comparable. When attempting to compare EPDs or life cycle impacts of products from different companies, the user should be aware of 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 specifics of the product modeled.

### Company Description

Herman Miller creates inspiring designs to help people do great things at work, for learning, for wellness, at home, wherever people are. Our designs and the designers who work with us solve real problems for people and their organizations. This way of thinking about design has led us to be recognized as an innovator in furnishings, personal work accessories, and strategic services.

### Our Sustainability Goals

We will be Resource Smart, Eco-inspired, and Community Driven.

#### Resource Smart

- Zero Waste
- Net Zero Water
- Net Zero Energy

#### Eco-inspired Design

- All products designed for the environment
- All products BIFMA level 3 certified
- Closed-Loop recycling of used product

#### Community Driven

- All employees engaged in Earthright
- All suppliers committed to being Resource Smart

### LEED

Please refer to [www.hermanmiller.com/ecoscorecard](http://www.hermanmiller.com/ecoscorecard) for detailed LEED information.

### Packaging

Returnable packaging is available.

### Textiles

100% recycled content textiles are available.

### Supplier Support

At Herman Miller, we are committed to working closely with our suppliers to reduce our collective impact on the environment. We encourage our suppliers to minimize their operations’ environmental impacts and require they assist us in decreasing our facilities’ environmental effects.

### Design for the Environment Criteria

Our commitment to corporate sustainability naturally includes minimizing the environmental impact of each of our products. Our Design for the Environment team applies environmentally sensitive design standards to both new and existing Herman Miller products, and goes beyond regulatory compliance to thoroughly evaluate new product designs in key areas:

#### • Material Chemistry and Safety of Inputs

What chemicals are in the materials we specify, and are they the safest available?

#### • Disassembly

Can we take products apart at the end of their useful life, to recycle their materials?

#### • Recyclability

Do the materials contain recycled content, and more importantly, can the materials be recycled at the end of the product’s useful life?

#### • Life Cycle Assessment (LCA)

Have we optimized the product based on the entire life cycle?

# Embody® Chair

## MATERIAL DECLARATION

### Functional Unit

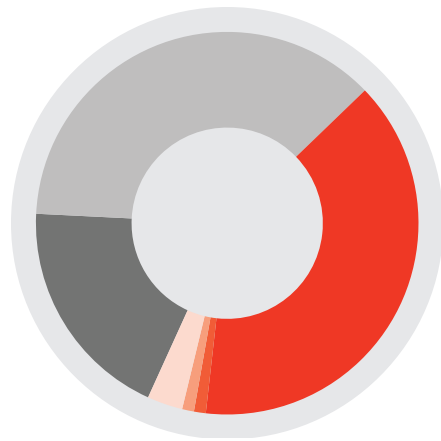
One unit of seating for one individual, maintained over a 10-year period, including packaging materials used for the final assembled product.

### Reference Flow and Product Description

One Embody Chair (product number CN122AWAAGIGIBB3501) with aluminum base, arms, casters, and suspension fabric seat and back—intended for use in North America—was modeled for this EPD.

### Content Declaration

The chart to the right details the materials included in the product.



### Total Material Components

- Aluminum 19%
- Steel 37%
- Plastic 39%
- Foam 1%
- Miscellaneous 1%
- Textile 3%

Material	Mass (kg)	Mass (%)	Resource
Acrylonitrile Butadiene Styrene (ABS)	0.437	1.89%	Virgin Non-renewable
Aluminum	4.449	19.23%	Recycled Content
Copolyester Elastomer	0.336	1.45%	Virgin Non-renewable
Epoxy Glass Filled	0.102	0.44%	Virgin Non-renewable
High Impact Polystyrene (HIPS)	0.086	0.37%	Virgin Non-renewable
Polyamide 6	5.275	22.80%	Virgin Non-renewable
Polyamide 6/6	0.140	0.61%	Virgin Non-renewable
Polybutylene Terephthalate	0.816	3.53%	Virgin Non-renewable
Polycarbonate	0.019	0.08%	Virgin Non-renewable
Polyethylene Terephthalate	0.587	2.54%	Virgin Non-renewable
Polyoxymethylene	0.673	2.91%	Virgin Non-renewable
Polypropylene/ Ethylene Propylene Diene Monomer	0.561	2.42%	Virgin Non-renewable
Polypropylene	0.553	2.39%	Virgin Non-renewable
Polyurethane	0.310	1.34%	Virgin Non-renewable
Steel	8.571	37.05%	Recycled Content
Thermoplastic Elastomer	0.128	0.55%	Virgin Non-renewable
Zinc	0.070	0.30%	Recycled Content
<b>Total</b>	<b>23.135</b>	<b>100%</b>	

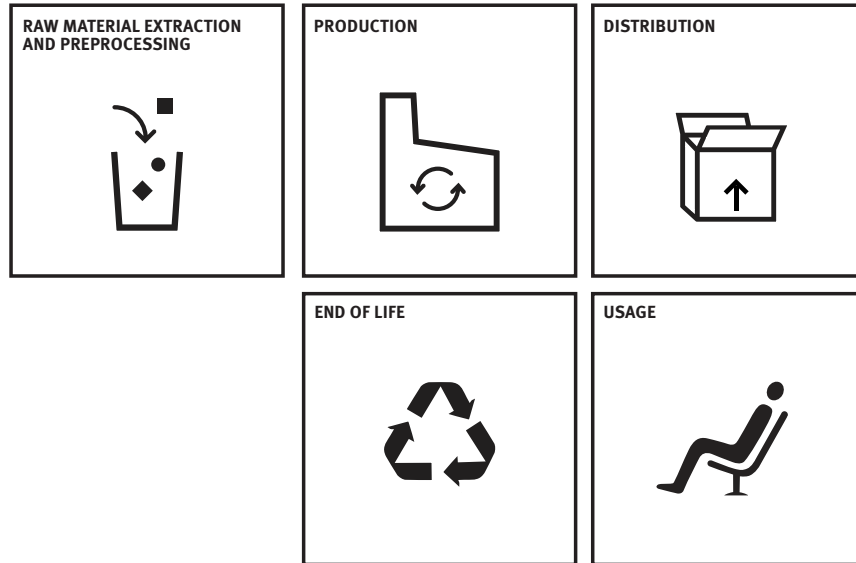
### Packaging\*

Corrugate	4.300	95.83%	Recycled Content
Polyethylene	0.097	2.16%	Virgin Non-renewable
Polypropylene	0.026	0.58%	Virgin Non-renewable
Polyurethane	0.064	1.43%	Virgin Non-renewable
<b>Total</b>	<b>4.487</b>	<b>100%</b>	

\*Returnable/reusable shipping blankets also available.

# Embody® Chair

## LIFE CYCLE ASSESSMENT



### ENVIRONMENTAL PRODUCT DECLARATION SYSTEM BOUNDARIES

Cradle to grave, including transportation.

#### Product

This EPD covers the Embody Chair produced for use in North America at Herman Miller's Greenhouse manufacturing plant in Holland, MI. The EPD applies to all colors of the Embody Chair with adjustable arms, tilt, aluminum base, and casters. The Embody Chair without arms is excluded from this study.

#### Raw Material Extraction and Preprocessing

The raw materials stage covers the extraction and production of the raw materials needed to manufacture the product. It includes the processing of the extracted raw material to the point where it can be made into a recognizable part, as well as transportation of the finished raw material to the part production factory.

#### Production

Materials are converted into parts and assemblies and made into the final product. This stage, often referred to as Gate to Gate, includes packaging of the final product and transport of parts and assemblies to the place of final product assembly and packaging.

#### Distribution

Transport of the product to the final customer, including retail and warehousing. Herman Miller products generally ship directly from the manufacturing plant to the final customer and are not sent to retail or warehousing.






#### Usage

Use, maintenance, and regular cleaning of the product. Herman Miller seating products are generally cleaned with a dry or damp rag and do not typically require maintenance during their warranted lifetime.






#### End of Life

End of life treatment of the product including landfill, recycling, waste-to-energy process, and transportation to the place of final disposal or recycling. We design our products to be easily disassembled and recycled; however, in this study, our product was modeled using the national average recycling values. As a result, more of our materials were modeled as going to the landfill than should occur in actual practice. Herman Miller also offers programs to help our customers find homes for their furniture and materials at end of life.

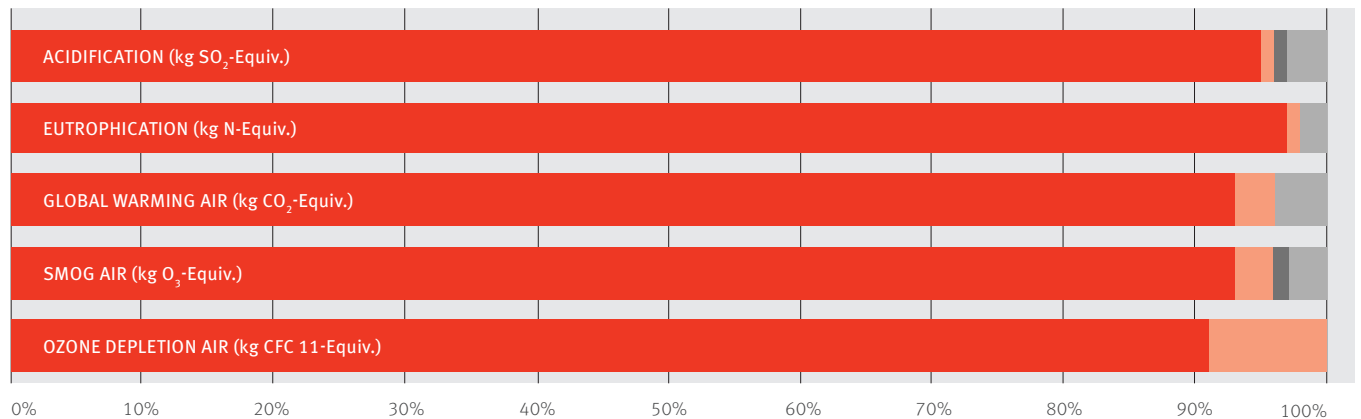
**Life Cycle Environmental Impacts**

	Impact Category	Unit	Total	Methodology
	<p><b>Acidification Potential</b>                      Atmospheric deposition of substances that can cause a change of acidity in the soil. Changes in levels of acidity can cause a shift of species to occur.</p>	kg SO <sub>2</sub> -eq	0.29	TRACI 2.1 as based on ASTRAP (Shannon 1991, 1992)
	<p><b>Eutrophication Water</b>                      Nutrient enrichment of the aquatic environment that impacts its ecological quality of water.</p>	kg nitrogen-eq	0.10	TRACI 2.1 as characterized by the Redfield Ratio Model (1963)
	<p><b>Global Warming Potential (100 Years)</b>                      A measure of the potential of emitted gasses to cause an increase in the radiative forcing potential of the atmosphere leading to climate change.</p>	kg CO <sub>2</sub> -eq	98	TRACI 2.1 as characterized by IPCC 2001, 2007
	<p><b>Photochemical Ozone Creation Potential (Smog)</b>                      Air pollution derived from man-made emissions to the atmosphere that can potentially cause ground level ozone.</p>	kg O <sub>3</sub> -eq	4.0	TRACI 2.1 as based on Carter, W.SAPRC Atmospheric Chemical Mechanisms and VOC reactivity scale (2010)
	<p><b>Ozone Depletion Potential</b>                      Air pollution from man-made emissions to the atmosphere that have the ability to destroy ozone that protects the earth from UV sun-rays.</p>	kg CFC-11 eq	3.2 x 10 <sup>-7</sup>	TRACI 2.1 based on Handbook for the International Treaties for the Protection of the Ozone Layer (UNEP-SETAC 2000)

**Detailed Life Cycle Impact Assessment**

	LCIA Results	Unit	Total	Raw Material Production	Product Production	Distribution and Retail	End of Life
	Acidification Potential	kg SO <sub>2</sub> -eq	2.9x10 <sup>-1</sup>	2.8x10 <sup>-1</sup>	4.1x10 <sup>-3</sup>	1.7x10 <sup>-3</sup>	8.1x10 <sup>-3</sup>
	Eutrophication Water	kg nitrogen-eq	1.0x10 <sup>-1</sup>	9.9x10 <sup>-2</sup>	6.8x10 <sup>-4</sup>	1.1x10 <sup>-4</sup>	2.7x10 <sup>-3</sup>
	Global Warming Potential	kg CO <sub>2</sub> -eq	9.8x10 <sup>-1</sup>	9.1x10 <sup>-1</sup>	2.6x10 <sup>0</sup>	3.4x10 <sup>-1</sup>	3.8x10 <sup>0</sup>
	Photochemical Ozone Creation Potential (Smog)	kg O <sub>3</sub> -eq	4.0x10 <sup>0</sup>	3.7x10 <sup>0</sup>	1.1x10 <sup>-1</sup>	5.1x10 <sup>-2</sup>	1.3x10 <sup>-1</sup>
	Ozone Depletion Potential	kg CFC-11-eq	3.2x10 <sup>-7</sup>	2.9x10 <sup>-7</sup>	3.0x10 <sup>-8</sup>	2.5x10 <sup>-12</sup>	3.7x10 <sup>-11</sup>

**Life Cycle Impacts of the Embody Chair**



**Detailed Life Cycle Assessment**

- Raw Material Production
- Product Production
- Distribution and Retail
- End of Life

**Detailed Life Cycle Inventory**

<b>LCI Results</b>	<b>Unit</b>	<b>Total</b>	<b>Raw Material Production</b>	<b>Product Production</b>	<b>Distribution and Retail</b>	<b>End of Life</b>
<b>Energy Demand</b>						
Primary Energy	MJ	1.6x10 <sup>3</sup>	1.5x10 <sup>3</sup>	3.9x10 <sup>1</sup>	5.1x10 <sup>0</sup>	1.9x10 <sup>1</sup>
Fossil Fuel Energy	MJ	1.5x10 <sup>3</sup>	1.5x10 <sup>3</sup>	3.9x10 <sup>1</sup>	5.0x10 <sup>0</sup>	1.8x10 <sup>1</sup>
Nuclear Energy	MJ	4.0x10 <sup>1</sup>	4.0x10 <sup>1</sup>	4.2x10 <sup>-2</sup>	2.1x10 <sup>-2</sup>	6.0x10 <sup>-1</sup>
Renewable Energy	MJ	5.3x10 <sup>1</sup>	5.2x10 <sup>1</sup>	4.5x10 <sup>-2</sup>	3.0x10 <sup>-2</sup>	7.2x10 <sup>-1</sup>
<b>Waste</b>						
Waste to Landfill	kg	2.1x10 <sup>1</sup>	0.0x10 <sup>0</sup>	0.0x10 <sup>0</sup>	0.0x10 <sup>0</sup>	2.1x10 <sup>1</sup>
Waste to Incinerator (energy recovery)	kg	1.1x10 <sup>-1</sup>	0.0x10 <sup>0</sup>	1.1x10 <sup>-1</sup>	0.0x10 <sup>0</sup>	0.0x10 <sup>0</sup>
Waste to Incinerator (without energy recovery)	kg	0.0x10 <sup>0</sup>	0.0x10 <sup>0</sup>	0.0x10 <sup>0</sup>	0.0x10 <sup>0</sup>	0.0x10 <sup>0</sup>
Waste to Recycling	kg	6.9x10 <sup>0</sup>	0.0x10 <sup>0</sup>	6.4x10 <sup>-1</sup>	0.0x10 <sup>0</sup>	6.3x10 <sup>0</sup>
Hazardous Waste	kg	2.5x10 <sup>-2</sup>	2.4x10 <sup>-2</sup>	3.2x10 <sup>-5</sup>	1.2x10 <sup>-5</sup>	6.8x10 <sup>-4</sup>
<b>Other</b>						
Fresh Water Use	kg	1.2x10 <sup>4</sup>	1.2x10 <sup>4</sup>	2.3x10 <sup>1</sup>	1.0x10 <sup>1</sup>	4.9x10 <sup>2</sup>

# Embody® Chair

## EPD and LCA Creation and Verification

The EPD and LCA were created by Herman Miller's Design for the Environment Team.

## References

PCR for Environmental Product Declarations Seating: UNFCFC 3811, Valid through November 14, 2019.

Recycling and disassembly instructions can be found at [hermanmiller.com/products/seating/performance-work-chairs/embody-chairs.html](http://hermanmiller.com/products/seating/performance-work-chairs/embody-chairs.html)

LCA for Embody Chair, November, 2014

ISO 14025:2006 Environmental labels and Declaration - Type III Environmental Declaration - Principles and Procedures.

## PCR REVIEW:

### HermanMiller Inc.

Reference PCR: Product Category Rule for Environmental Product Declaration BIFMA PCR for Seating. Valid through November 14, 2019.

PCR Review was conducted by: NSF International by an LCA expert panel chaired by Tom Gloria, Industrial Ecology Consultants. Email [ncss@nsf.org](mailto:ncss@nsf.org) for any PCR questions.

This EPD is based on the November, 2014 LCA for Embody Chair. The LCA was independently verified in accordance with ISO 14044 and the PCR by an external reviewer.

This Declaration was independently verified in accordance with ISO 14025 and the PCR.

Internal  External

Rita Schenck  
Name

  
Signature

Rita Schenck  
Name

  
Signature

November 14, 2014  
EPD Approved Date

November 14, 2019  
EPD valid through.  
Program Operator (Earthsure) [iere.org/programs/earthsure/](http://iere.org/programs/earthsure/)



Manufacturer's contact information  
<http://www.hermanmiller.com/contact.html>



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