



## Environmental Product Declaration

# Sayl® Work Chair, Suspension Back

### Design Story

Designed by Yves Behar

Inspired by suspension bridges—structures that deliver the most using the least material—Sayl's 3D Intelligent® back lets you stretch and move, striking a healthy balance between support and freedom. The elastomer strands vary in thickness and tension to provide greater support along the spine where you need it most, and less everywhere else, so you are free to move.

Sayl's unframed back and Y-Tower® support create a striking visual aesthetic that reveals both the designer's inspiration and intent. Whether you choose the full-suspension or upholstered back, an expressive color palette gives you plenty of options for personalizing your chair.



### Environmental Data

- 8% Recycled Content
- 7% Post Consumer
- 1% Pre Consumer
- Up to 91% Recyclability \*

### Life Cycle Assessment Data

- 82 kg CO<sub>2</sub>eq Global Warming
- 0.24 kg SO<sub>2</sub> eq Acidification
- 0.14 kg Neq Eutrophication
- 3.6 kg O<sub>3</sub> eq Smog
- 1400 MJ Primary Energy Demand
- 4.2 X 10<sup>-7</sup> kg CFC-11eq Ozone Depletion

### Environmental Certifications

- GREENGUARD® Gold
- 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, Ecoinspired, and Community Driven.

#### Resource Smart

- Zero Waste
- Net Zero Water
- Net Zero Energy

#### Ecoinspired 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?

# Sayl® Work Chair, Suspension Back

## MATERIAL DECLARATION

### Functional Unit

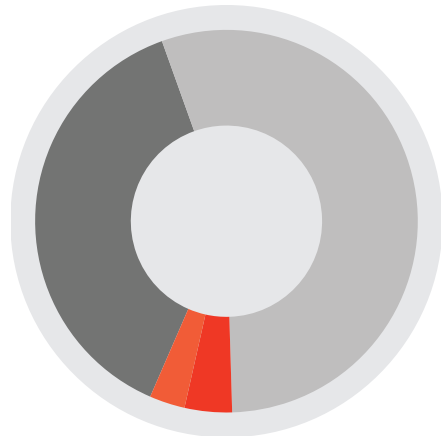
One unit of seating for one individual, maintained over a 10-year period, including packaging materials used for the final assembled product.

### Reference Flow and Product Description

One Sayl Chair (product number AS2SA22AAN2) with plastics base, arms, casters, and upholstered seat and suspension 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

- Steel 38%
- Plastic 55%
- Foam 4%
- Miscellaneous 3%

Material	Mass (kg)	Mass (%)	Resource
Acrylonitrile Butadiene Styrene (ABS)	0.13	0.77%	Virgin Non-renewable
Epoxy Glass Filled	0.32	1.99%	Virgin Non-renewable
Polyamide 6	6.6	40.2%	Virgin Non-renewable
Polyamide 6/6	0.02	0.12%	Virgin Non-renewable
Polyethylene Terephthalate	0.05	0.28%	Virgin Non-renewable
Polyoxymethylene	0.06	0.38%	Virgin Non-renewable
Polypropylene	1.51	9.38%	Virgin Non-renewable
Polyurethane	0.7	4.3%	Virgin Non-renewable
Rubber	0.01	0.03%	Virgin Renewable
Steel	6.25	38.35%	Recycled Content
Thermoplastic Polyurethane	0.71	4.35%	Virgin Non-renewable
<b>Total</b>	<b>16.4</b>	<b>100%</b>	

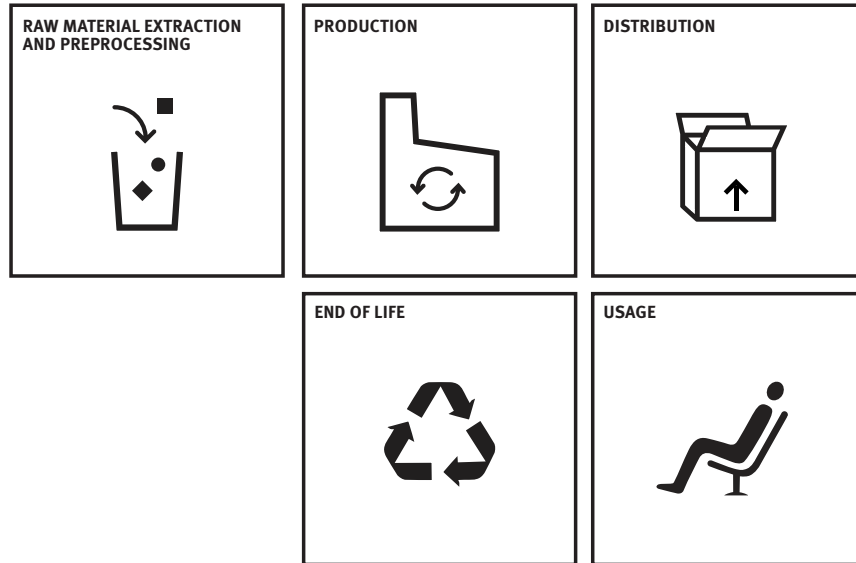
### Packaging\*

Corrugate	4.11	90.32%	Recycled Content
Polyethylene	0.17	3.78%	Virgin Non-renewable
Polypropylene	0.01	0.26%	Virgin Non-renewable
Polyurethane with film	0.26	5.63%	Virgin Non-renewable
<b>Total</b>	<b>3.8</b>	<b>100%</b>	

\*Returnable/reusable shipping blankets also available.

# Sayl® Work Chair, Suspension Back

## LIFE CYCLE ASSESSMENT



### ENVIRONMENTAL PRODUCT DECLARATION SYSTEM BOUNDARIES

Cradle to grave, including transportation.

#### Product

This EPD covers the Sayl 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 Sayl Chair with suspension back, adjustable arms or no arms, lumbar or no lumbar, tilt, plastic base, and casters including all textile choices for the seat. The Sayl Chair with upholstered back 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

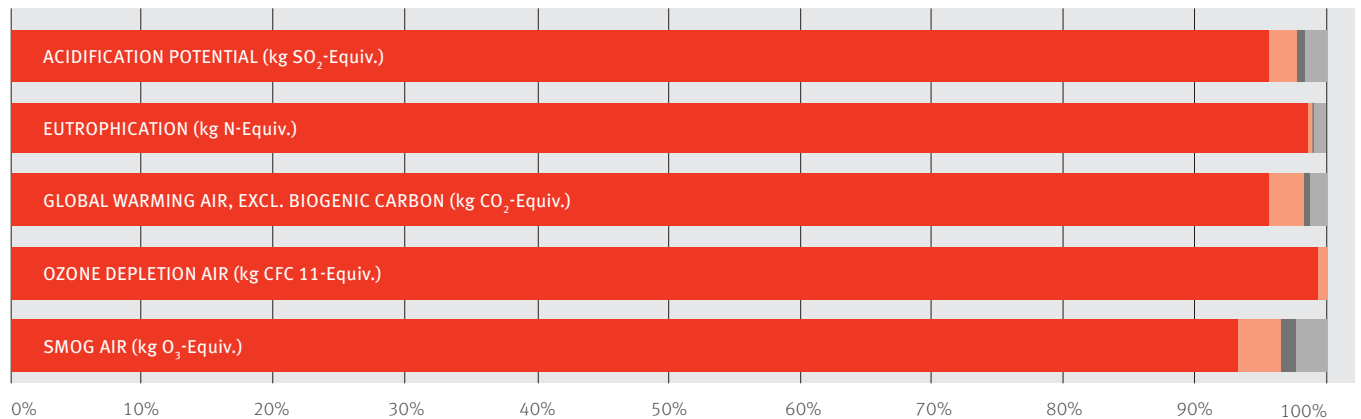
	Impact Category	Unit	Total	Methodology
	<p><b>Acidification Potential</b>                      Atmospheric deposition of substances that can cause a change of acidity in the soil. Changes in levels of acidity can cause a shift of species to occur.</p>	kg SO <sub>2</sub> -eq	0.24	TRACI 2.1 as based on 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	0.14	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	82	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	3.6	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	4.2 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)

# Sayl® Work Chair, Suspension Back

## 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	2.4x10 <sup>-1</sup>	2.3x10 <sup>-1</sup>	5.5x10 <sup>-3</sup>	1.3x10 <sup>-3</sup>	3.9x10 <sup>-3</sup>
	Eutrophication Water	kg nitrogen-eq	1.4x10 <sup>-1</sup>	1.3x10 <sup>-1</sup>	3.4x10 <sup>-4</sup>	8.1x10 <sup>-5</sup>	1.4x10 <sup>-3</sup>
	Global Warming Potential	kg CO <sub>2</sub> -eq	8.2x10 <sup>1</sup>	7.9x10 <sup>1</sup>	2.2x10 <sup>0</sup>	2.6x10 <sup>-1</sup>	1.1x10 <sup>0</sup>
	Photochemical Ozone Creation Potential (Smog)	kg O <sub>3</sub> -eq	3.6x10 <sup>0</sup>	3.4x10 <sup>0</sup>	1.3x10 <sup>-1</sup>	3.8x10 <sup>-2</sup>	8.3x10 <sup>-2</sup>
	Ozone Depletion Potential	kg CFC-11-eq	4.3x10 <sup>-7</sup>	4.2x10 <sup>-7</sup>	3.4x10 <sup>-9</sup>	1.9x10 <sup>-12</sup>	3.3x10 <sup>-11</sup>

## Life Cycle Impacts of the Sayl Chair



### Detailed Life Cycle Assessment

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

## Detailed Life Cycle Inventory

LCI Results	Unit	Total	Raw Material Production	Product Production	Distribution and Retail	End of Life
<b>Energy Demand</b>						
Primary Energy	MJ	1.4x10 <sup>3</sup>	1.4x10 <sup>3</sup>	3.4x10 <sup>1</sup>	3.8x10 <sup>0</sup>	1.6x10 <sup>1</sup>
Fossil Fuel Energy	MJ	1.3x10 <sup>3</sup>	1.3x10 <sup>3</sup>	3.4x10 <sup>1</sup>	3.8x10 <sup>0</sup>	1.5x10 <sup>1</sup>
Nuclear Energy	MJ	5.0x10 <sup>1</sup>	4.9x10 <sup>1</sup>	1.2x10 <sup>-1</sup>	1.6x10 <sup>-2</sup>	5.2x10 <sup>-1</sup>
Renewable Energy	MJ	4.8x10 <sup>1</sup>	4.7x10 <sup>1</sup>	4.1x10 <sup>-2</sup>	2.2x10 <sup>-2</sup>	5.9x10 <sup>-1</sup>
<b>Waste</b>						
Waste to Landfill	kg	1.4x10 <sup>1</sup>	0.0x10 <sup>0</sup>	0.0x10 <sup>0</sup>	0.0x10 <sup>0</sup>	1.4x10 <sup>1</sup>
Waste to Incinerator (energy recovery)	kg	1.1x10 <sup>-2</sup>	0.0x10 <sup>0</sup>	1.1x10 <sup>-2</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	6.4x10 <sup>0</sup>	0.0x10 <sup>0</sup>	6.5x10 <sup>-2</sup>	0.0x10 <sup>0</sup>	6.3x10 <sup>0</sup>
Hazardous Waste	kg	1.6x10 <sup>-2</sup>	1.6x10 <sup>-2</sup>	2.6x10 <sup>-5</sup>	9.2x10 <sup>-6</sup>	5.8x10 <sup>-4</sup>
<b>Other</b>						
Fresh Water Use	kg	7.8x10 <sup>3</sup>	7.4x10 <sup>3</sup>	1.9x10 <sup>1</sup>	7.7x10 <sup>0</sup>	4.1x10 <sup>2</sup>

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## 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 17, 2019.

Recycling and disassembly instructions can be found at <http://www.hermanmiller.com/products/seating/performance-work-chairs/sayl-chairs.html>

LCA for Sayl 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 17, 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 Sayl 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

*Rita Schenck*  
Signature

Rita Schenck

Name

*Rita Schenck*  
Signature

November 17, 2014  
EPD Approved Date

November 17, 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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