Environmental Product Declaration

Aeron® Work Stool

Design Story

Aeron's functionality shows through, contributing to a distinctive look that invites you to sit and experience the chair for yourself. From the transparency of the Pellicle® suspension material to the chair's curvilinear lines, Aeron was designed around people, with Bill Stumpf and Don Chadwick creating an aesthetic all their own. It's no wonder the chair was added to the permanent collection of the Museum of Modern Art™ even before the first one was sold.

Every material, every mechanism on Aeron advances the art and science of seating. The Pellicle seat and back distribute your weight evenly, eliminating pressure points and heat buildup. The Kinemat® tilt allows you to recline fluidly, as your body pivots naturally at the hips, knees, and ankles. And PostureFit® puts support where you need it most while seated—at the base of your spine.

Environmental Data

59% Recycled Content
56% Post Consumer
3% Pre Consumer
Up to 88% Recyclability*

Life Cycle Assessment Data

102 kg CO_2eq Global Warming
0.39 kg SO_2 eq Acidification
0.03 kg Neq Eutrophication
4.7 kg O_3 eq Smog
1700 MJ Primary Energy Demand
4.2 X 10^{-7} kg CFC-11eq Ozone Depletion

Environmental Certifications

GREENGUARD Certified
GREENGUARD Gold Certified

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 for detailed LEED information.

Packaging

Returnable packaging is available for the Aeron Chair.

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?

*Based on availability of recycling facilities.

MATERIAL DECLARATION

Functional Unit

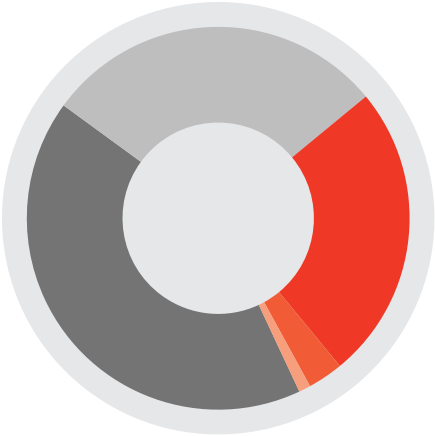
One unit of seating for one individual, maintained over a 10-year period, including packaging materials used for the final assembled product.

Reference Flow and Product Description

One Aeron Stool (product number AE723AWBGIAJNNBBBK3D1) with aluminum base, arms, casters, and Pellicle fabric—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

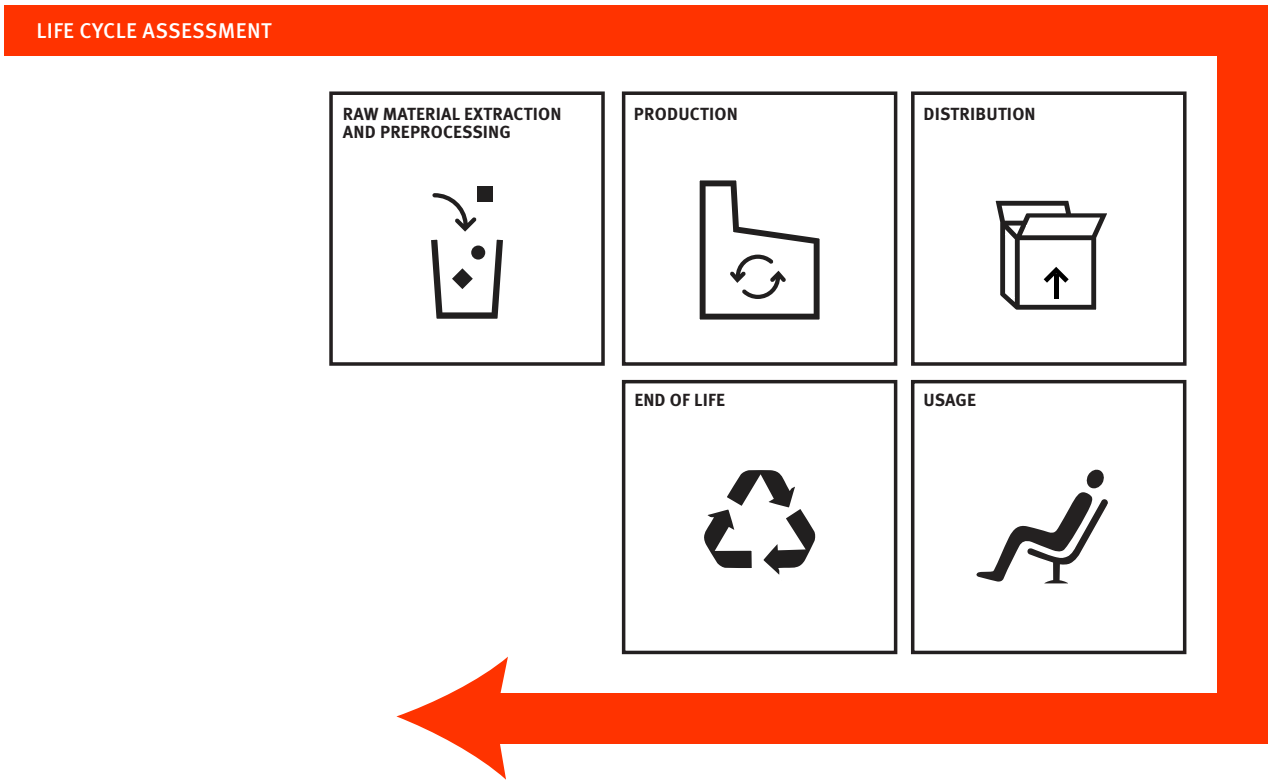
- Aluminum 42%
- Steel 29%
- Plastic 25%
- Foam 3%
- Miscellaneous 1%

Material	Mass (kg)	Mass (%)	Resource
Acrylonitrile Butadiene Styrene (ABS)	0.464	2%	Virgin Non-renewable
Aluminum	12.2	43%	Recycled Content
PA6	4.88	17%	Virgin Non-renewable/ Recycled Content
PA6/6	0.122	0%	Virgin Non-renewable
PBT	0.004	0%	Virgin Non-renewable
PET	0.006	0%	Virgin Non-renewable
POM	0.31	1%	Virgin Non-renewable
Powdercoat	0.124	1%	Virgin Non-renewable
PP	0.197	1%	Virgin Non-renewable
PP/SEBS	0.358	1%	Virgin Non-renewable
PU	0.862	3%	Virgin Non-renewable
Rubber	0.235	1%	Virgin Renewable
Steel	8.22	29%	Recycled Content
TEEE	0.704	2%	Virgin Non-renewable
TPE	0.045	0%	Virgin Non-renewable
Zinc	0.005	0%	Recycled Content
Total	**28.1**	**100%**	

Packaging*

Corrugate	4.76	99%	Recycled Content
PE Film	0.011	0%	Virgin Non-renewable
PP Banding	0.022	1%	Virgin Non-renewable
Total	**4.793**	**100%**	

*Returnable/reusable shipping blankets also available.



ENVIRONMENTAL PRODUCT DECLARATION SYSTEM BOUNDARIES

Cradle to grave, including transportation.

Product

This EPD covers the Aeron Work Stool produced for use in North America at Herman Miller's GreenHouse manufacturing plant in Holland, Michigan. The EPD applies to all colors of the Aeron Work Stool with adjustable arms, tilt, powder coated aluminum base, casters, and suspension seat including the options of lumber or no lumbar, posture fit or no posture fit, fixed arms, low height adjustment, or high height adjustment, glides or casters, and polished aluminium base. The Aeron Work Stool without arms and/or with leather armpads are 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.

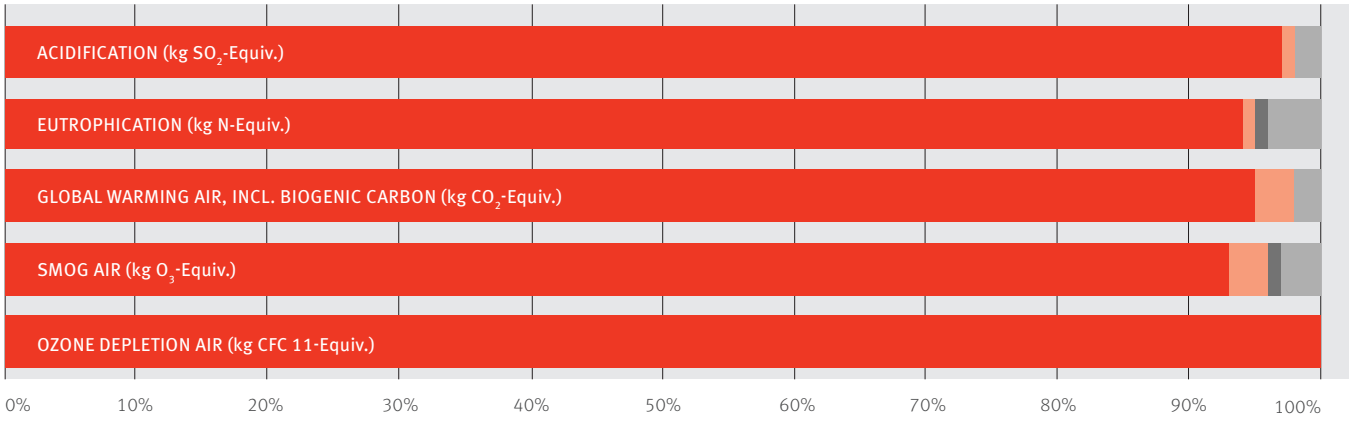
Life Cycle Environmental Impacts

Impact Category	Unit	Total	Methodology
Acidification Potential 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.	kg SO_2 eq	0.39	TRACI 2.1 as based on ASTRAP (Shannon 1991, 1992)
Eutrophication Water Nutrient enrichment of the aquatic environment that impacts its ecological quality of water.	kg nitrogen-eq	0.03	TRACI 2.1 as characterized by the Redfield Ratio Model (1963)
Global Warming Potential (100 Years) A measure of the potential of emitted gasses to cause an increase in the radiative forcing potential of the atmosphere leading to climate change.	kg CO_2-eq	102	TRACI 2.1 as characterized by IPCC 2001, 2007
Photochemical Ozone Creation Potential (Smog) Air pollution derived from man-made emissions to the atmosphere that can potentially cause ground level ozone.	kg O_3-eq	4.7	TRACI 2.1 as based on Carter, W.SAPRC Atmospheric Chemical Mechanisms and VOC reactivity scale (2010)
Ozone Depletion Potential Air pollution from man-made emissions to the atmosphere that have the ability to destroy ozone that protects the earth from UV sun-rays.	kg CFC-11 eq	4.2×10^{-7}	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_2 eq	3.9×10^{-1}	3.8×10^{-1}	3.5×10^{-3}	2.1×10^{-3}	6.1×10^{-3}
Eutrophication Water	kg nitrogen-eq	2.8×10^{-2}	2.6×10^{-2}	3.0×10^{-4}	1.9×10^{-4}	1.1×10^{-3}
Global Warming Potential	kg CO_2-eq	1.0×10^{2}	9.7×10^{1}	2.4×10^{0}	4.4×10^{-1}	1.5×10^{0}
Photochemical Ozone Creation Potential (Smog)	kg O_3-eq	4.7×10^{0}	4.4×10^{0}	1.2×10^{-1}	6.5×10^{-2}	1.4×10^{-1}
Ozone Depletion Potential	kg CFC-11-eq	4.2×10^{-7}	4.2×10^{-7}	2.1×10^{-10}	3.0×10^{-12}	4.6×10^{-11}

Life Cycle Impacts of the Aeron Chair Product



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
Energy Demand						
Primary Energy	MJ	$1.7x10^{3}$	$1.6x10^{3}$	$3.9x10^{1}$	$6.5x10^{0}$	$2.3x10^{1}$
Fossil Fuel Energy	MJ	$1.5x10^{3}$	$1.5x10^{3}$	$3.9x10^{1}$	$6.4x10^{0}$	$2.2x10^{1}$
Nuclear Energy	MJ	$5.4x10^{1}$	$5.3x10^{1}$	$5.2x10^{-2}$	$2.7x10^{-2}$	$6.7x10^{-1}$
Renewable Energy	MJ	$7.0x10^{1}$	$6.9x10^{1}$	$1.3x10^{-1}$	$9.8x10^{-2}$	$1.1x10^{0}$
Waste						
Waste to Landfill	kg	$2.8x10^{1}$	$0.0x10^{0}$	$0.0x10^{0}$	$0.0x10^{0}$	$2.8x10^{1}$
Waste to Incinerator (energy recovery)	kg	$0.0x10^{0}$	$0.0x10^{0}$	$0.0x10^{0}$	$0.0x10^{0}$	$0.0x10^{0}$
Waste to Incinerator (without energy recovery)	kg	$0.0x10^{0}$	$0.0x10^{0}$	$0.0x10^{0}$	$0.0x10^{0}$	$0.0x10^{0}$
Waste to Recycling	kg	$7.3x10^{0}$	$0.0x10^{0}$	$0.0x10^{0}$	$0.0x10^{0}$	$7.3x10^{0}$
Hazardous Waste	kg	$1.7x10^{-4}$	$1.5x10^{-4}$	$8.8x10^{-6}$	$9.2x10^{-7}$	$4.2x10^{-6}$
Other						
Consumptive Water Use	kg	$4.5x10^{4}$	$4.5x10^{4}$	$3.3x10^{1}$	$1.9x10^{1}$	$5.6x10^{2}$

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: UNCFC 3811, Valid through April 30, 2019.

Recycling and disassembly instructions can be found at *http://www.hermanmiller.com/products/seating/stools/aeron-stool.html*

LCA for Aeron Work Stool, May 2015

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

PCR REVIEW:

Herman Miller, Inc.

Reference PCR: Product Category Rule for Environmental Product Declaration BIFMA PCR for Seating. Valid through April 30, 2019.

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

This EPD was based on the May 2015 LCA for the Aeron Work Stool. 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

April 30, 2015
EPD Approval Date

April 30, 2020
EPD valid through this date.
Program Operator (Earthsure) iere.org/programs/earthsure/

Manufacturer's contact information
www.hermanmiller.com/contact

GREENGUARD Certified
Products are certified to GREENGAURD standards for low chemical emissions into indoor air during product usage. For more information visit ul.com/gg.

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