Environmental Product Declaration

Setu® Multipurpose Chair with Lyris 2

Design Story

Designed by Studio 7.5

Setu is Studio 7.5's solution for today's more collaborative, less formal workspaces. Material innovation gives the Setu chair its unique combination of flex and strength. The Kinematic Spine™ uses two types of polypropylene to control resistance as you recline and support your weight, without a tilt mechanism. More structural element than textile, the Lyris 2™ suspension seat and back conform to your contours and aerate your body as you sit comfortably.

Setu's minimalist, dematerialized design is at home in spaces where different people may use the same chair throughout the day. A range of upholstery options means you can outfit your Setu chairs to stand out or to blend in.

Environmental Data

53% Recycled Content
6% Post Consumer
47% Pre Consumer
Up to 96% Recyclability *

Life Cycle Assessment Data

48 kg $C0_2$eq Global Warming
0.21 kg SO_2 eq Acidification
0.04 kg Neq Eutrophication
2.3 kg O_3 eq Smog
840 MJ Primary Energy Demand
3.1 X 10^{-7} kg CFC-11eq Ozone Depletion

Environmental Certifications

GREENGUARD® Gold
Cradle to Cradle Certified℠ Silver
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 for detailed LEED information.

Packaging

Returnable packaging is 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?

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Cradle to Cradle Certified℠ is a certification mark licensed by the Cradle to Cradle Products Innovation Institute.
*Based on Availability of recycling facilities

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Global Greentag Certified™ is an Australian Competition

Setu® Multipurpose Chair with Lyris 2

MATERIAL DECLARATION

Functional Unit

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

Reference Flow and Product Description

One Setu Multipurpose Chair (product number CQ51MAG1G1BBNNN) 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.

Material	Mass (kg)	Mass (%)	Resource
Aluminum	4.172	46.04%	Recycled Content
Copolyester Elastomer/ Polyethylene Terephthalate	0.195	2.15%	Virgin Non-renewable
Polyamide 6	1.081	11.93%	Virgin Non-renewable
Polyamide 6/6	0.003	0.03%	Virgin Non-renewable
Polycarbonate	0.050	0.55%	Virgin Non-renewable
Polyoxymethylene	0.090	0.26%	Virgin Non-renewable
Polyethylene	0.014	0.15%	Virgin Non-renewable
Polypropylene	1.404	15.49%	Virgin Non-renewable
Polypropylene/ Ethylene Propylene Diene Monomer	0.176	1.94%	Virgin Non-renewable
Steel	1.560	17.14%	Recycled Content
Thermoplastic Elastomer	0.391	4.31%	Virgin Non-renewable
Total	**9.17**	**100%**	

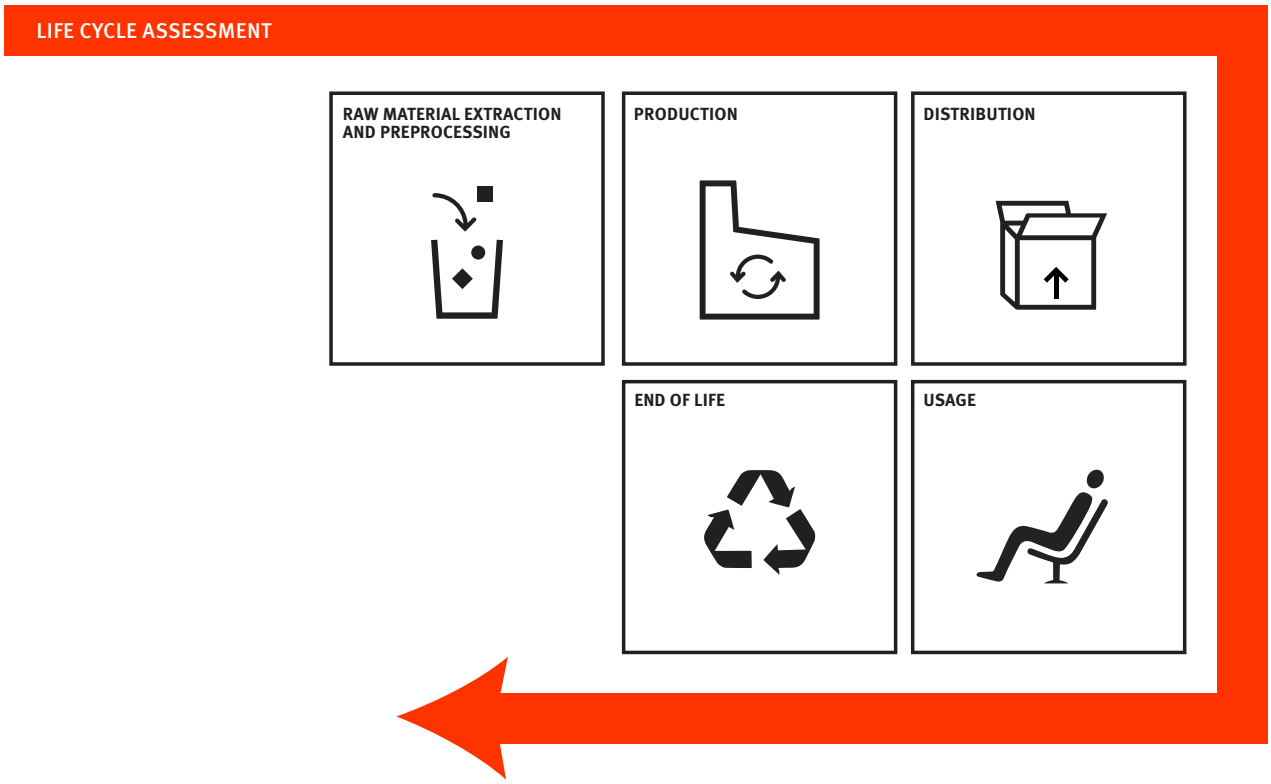
Packaging*

Corrugate	2.300	94.49%	Recycled Content
Polyethylene	0.115	4.72%	Virgin Non-renewable
Polypropylene	0.014	0.58%	Virgin Non-renewable
Polyurethane with film	0.005	0.21%	Virgin Non-renewable
Total	**2.434**	**100%**	

Total Material Components

- Aluminum 46%
- Steel 17%
- Plastic 37%

*Returnable/reusable shipping blankets also available.



ENVIRONMENTAL PRODUCT DECLARATION SYSTEM BOUNDARIES

Cradle to grave, including transportation.

Product

This EPD covers the Setu Multipurpose 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 Setu Multipurpose Chair with arms, 5 star aluminum base, and casters. The 4 star base side chair is also included in these results. The Setu Chair without arms is excluded from this study, as is Setu Lounge Chair, and Setu Stool. The upholstered Setu is aslo not covered by this EPD.

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 molded 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.

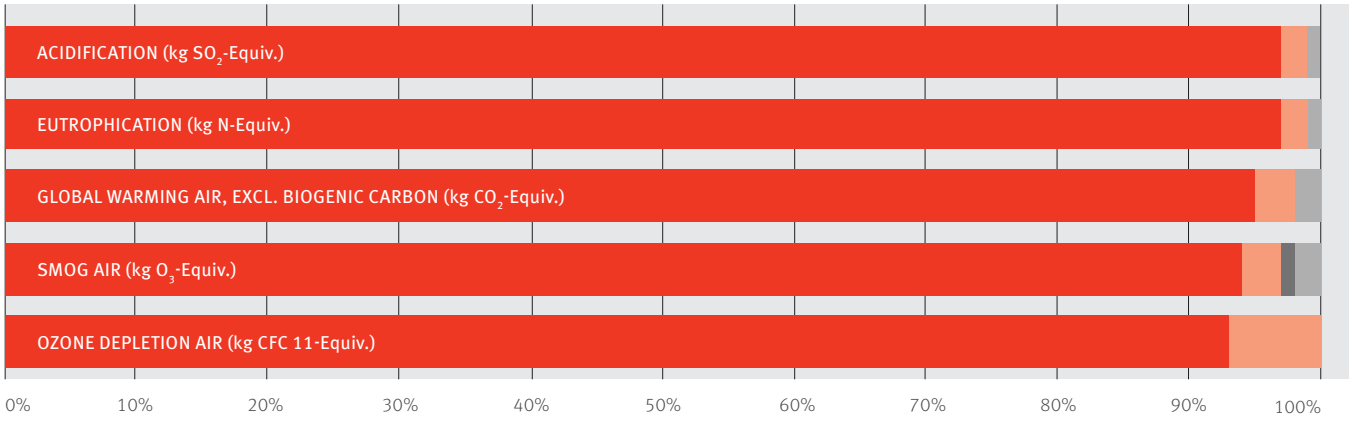
Life Cycle Environmental Impacts

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	0.21	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	0.04	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	48	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	2.3	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	3.1×10^{-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	$2.1x10^{-1}$	$2.1x10^{-1}$	$3.4x10^{-3}$	$7.0x10^{-4}$	$2.0x10^{-3}$
Eutrophication Water	kg nitrogen-eq	$3.7x10^{-2}$	$3.6x10^{-2}$	$4.8x10^{-4}$	$4.5x10^{-5}$	$5.2x10^{-4}$
Global Warming Potential	kg CO_2-eq	$4.8x10^{1}$	$4.6x10^{1}$	$1.7x10^{1}$	$1.4x10^{-1}$	$4.6x10^{-1}$
Photochemical Ozone Creation Potential (Smog)	kg O_3-eq	$2.3x10^{0}$	$2.1x10^{0}$	$8.0x10^{-2}$	$2.1x10^{-2}$	$4.5x10^{-2}$
Ozone Depletion Potential	kg CFC-11-eq	$3.1x10^{-7}$	$2.9x10^{-7}$	$2.1x10^{-8}$	$1.0x10^{-12}$	$1.2x10^{-11}$

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

LCI Results	Unit	Total	Raw Material Production	Product Production	Distribution and Retail	End of Life
Energy Demand						
Primary Energy	MJ	$8.4x10^{2}$	$8.0x10^{2}$	$2.5x10^{1}$	$2.1x10^{0}$	$7.1x10^{0}$
Fossil Fuel Energy	MJ	$6.8x10^{2}$	$6.5x10^{2}$	$2.5x10^{1}$	$2.1x10^{0}$	$6.7x10^{0}$
Nuclear Energy	MJ	$4.9x10^{1}$	$4.9x10^{1}$	$2.3x10^{-2}$	$8.8x10^{-3}$	$2.1x10^{-1}$
Renewable Energy	MJ	$1.0x10^{2}$	$1.0x10^{2}$	$2.3x10^{-2}$	$1.2x10^{-2}$	$2.7x10^{-1}$
Waste						
Waste to Landfill	kg	$8.6x10^{0}$	$0.0x10^{0}$	$0.0x10^{0}$	$0.0x10^{0}$	$8.6x10^{0}$
Waste to Incinerator (energy recovery)	kg	$8.0x10^{-2}$	$0.0x10^{0}$	$8.0x10^{-2}$	$0.0x10^{0}$	$0.0x10^{0}$
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	$3.3x10^{0}$	$0.0x10^{0}$	$4.5x10^{-1}$	$0.0x10^{0}$	$2.9x10^{0}$
Hazardous Waste	kg	$4.1x10^{-2}$	$4.1x10^{-2}$	$1.8x10^{-5}$	$5.1x10^{-6}$	$2.4x10^{-4}$
Other						
Fresh Water Use	kg	$8.0x10^{4}$	$8.0x10^{4}$	$1.3x10^{1}$	$4.3x10^{0}$	$1.8x10^{2}$

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 November 21, 2019.

Recycling and disassembly instructions can be found at *hermanmiller.com/products/seating/multi-use-guest-chairs/setu-chairs.html*

LCA for Setu 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 21, 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 is based on the November, 2014 LCA for Setu 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 21, 2014
EPD Approved Date

November 21, 2019
EPD valid through.
Program Operator (Earthsure) iere.org/programs/earthsure/

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

GREENGUARD Certification
Certification in Indoor Air Quality℠ – products designed for use in indoor spaces meeting strict chemical emissions limits. Children & Schools℠ products certified are suitable for use in environments where children and others work, play or reside.

Cradle to Cradle Certified℠ Program
A multi-attribute program that assesses products for safety to human & environmental health, design for future use cycles, and sustainable manufacturing processes.

level™ Certification
The level conformance mark ensures a comprehensive, independent, and impartial assessment of the environmental and social impacts of a product.

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