

Verus Chair Plastic Base



Environmental Product Declaration

Date of Issue: November 30, 2022

Date of Expiration: November 30, 2027

Product Category Rules

BIFMA PCR for Seating, UNCPC 3811 ISO 14025/14040/14044 and EN 15804+A1

Functional Unit

1 seat maintained for a 10-year period (1 Verus Chair)

This EPD 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 software tool used to conduct the study.

*The results presented in this report consist of the weighted average impacts of Verus Chairs made in the United States, the United Kingdom, and China. The reference product noted relates to a specific SKU for the product manufactured in the US.





Environmental Product Declaration

Verus Chairs

	NCE Contitionation II C							
Program Operator	NSF Certification LLC 789 N. Dixboro, Ann Arbor, MI 48105 www.nsf.org							
Manufacturer Name and Address	Herman Miller 855 East Main Ave. PO Box 302 Zeeland, MI 49464-0302 USA							
Declaration Number	EPD#10799							
Declared Product and Functional Unit	Verus Chairs Functional Unit: 1 unit of seating for 1 individual maintained for 10 years							
Reference PCR and Version Number	BIFMA PCR for Seating							
Product's intended Application and Use	Office Chair							
Product RSL	10 years							
Markets of Applicability	North America, EMEA, APAC							
Date of Issue	November 30, 2022							
Period of Validity	5 years from date of issue							
EPD Type	Product Specific							
Intended Audience	Business-to-Business, Business-to-Consumer							
Range of Dataset Variability	N/A							
EPD Scope	Cradle to Grave							
Year of reported manufacturer primary data	Fiscal Year 2020 (April 2019-March 2020)							
LCA Software and Version Number	GaBi 10.6.1.35							
LCI Database and Version Number	GaBi Database 2021.1							
LCIA Methodology and Version Number	TRACI 2.1 CML 2001-Oct 2012							
The PCR review was conducted by:	Review Panel Chaired by Dr. Thomas Gloria							
This declaration was independently verified in accordance with ISO 14025: 2006. The CEN Norm EN 15804 (2012), serves as the core PCR, with additional considerations from BIFMA PCR for Office Furniture Seating Products. □ Internal □ External	Tony Favilla afavilla@nsf.org							
This reference life cycle assessment was conducted in accordance with ISO 14044 and the reference PCRs:	Herman Miller Background Report for LCA/EPD Creation Tool v1.6 Matt Van Duinen - WAP Sustainability Consulting matt@wapsustainability.com							
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Jack Geibig - EcoForm jgeibig@ecoform.com Jack Huliz							
References	BIFMA PCR for Seating: UNCPC 3811. Version 3 ISO 14025/40/44; 2006 EN 15804:2012+A1; 2013 Herman Miller Background Report for LCA/EPD Creation Tool v1.6							
Limitations								

Limitations:

Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of Products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the building energy use phase as instructed under this PCR. Full conformance with the PCR for Products allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible". Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.

Product Description

Verus redefines what an affordable work chair can be. Efficiently designed and engineered to assure ergonomic alignment and support, it gives people both short-term and long-term comfort at an equally comfortable price.

With a quiet, versatile form that comes in a range of colors and fabrics and the option for a suspension, upholstered, or TriFlex back, the Verus family flexes easily to any aesthetic.

Everyone in your office deserves ergonomic support and spinal alignment. With built-in sacral reinforcement and options for adjustable lumbar support, Verus strengthens employee wellness through engineered design that's affordable for all.



Company Description

MillerKnoll is a collective of dynamic brands that comes together to design the world we live in. Together we are redefining modern design for the 21st century and changing the world for the better. As MillerKnoll, we form an unparalleled platform from which to imagine a more sustainable, caring, and beautiful world for everyone.

Herman Miller, a brand within MillerKnoll, 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

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.

Manufacturing Location

- 10201 Adams St, Holland, MI 49423, United States
- 1 Portal Rd, Bowerhill, Melksham, SN12 6GN, United Kingdom
- Building 68, No.9 Jiangchengxi Road, Gaobu Town, Dong-guan City, Guangdong Province, p.r. China

Warranty

Backed by Herman Miller's 12-year, 24/7 warranty

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

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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?

Product Environmental Data

	United States	United Kingdom	China
Recycled Content	26%	17%	10%
Post-Consumer	15%	13%	7%
Pre-Consumer	11%	4%	3%
Recyclability (max %) *	94%	95%	95%

*This recyclability rate is the maximum amount of the product that is recyclable, based on the availability of recycling facilities in the specified regions and the ability of the product to be disassembled. Note that, per the requirements of the PCR, the End-of-Life results presented in this EPD were calculated using the US EPA's recycling rates within the 2020 Municipal Solid Waste Report for parts that can be disassembled.

Environmental Certifications**

BIFMA level® 3 AFRDI Green Tick Platinum Indoor Advantage™ Gold

Packaging**

Returnable packaging is available.

Additional information, including installation and recycling instructions, can be found at https://www.hermanmiller.com/products/seating/office-chairs/verus-chairs/pro-resources/

**This data is specific to US-produced products. For data on UK-produced products, please contact your sales representative or visit www.hermanmiller.com

MATERIAL DECLARATION

Functional Unit

1 unit of seating for 1 individual maintained over a 10-year period, including packaging materials used for the final assembled product.

Reference Flow and Product Specifications

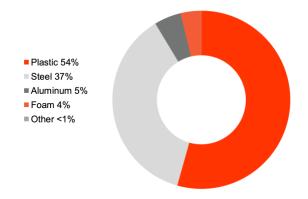
One unit of Verus seating (product number: PIA2B325AAAJBK36505BB23512) with interweave 2 suspension back, standard height range, semi synchronous tilt with limiter, fully adjustable arms, adjustable seat depth, adjustable lumbar with sacral support, and black base with black frame was modeled for this EPD. This is determined to be a representative product based on sales of the variations. The results presented on the subsequent pages consist of the weighted average impacts of Verus Chairs made in the United States, the United Kingdom, and China. The product composition table to the right relates to a specific SKU for the product manufactured in the US.

System Boundary

Cradle-to-Grave

Content Declaration

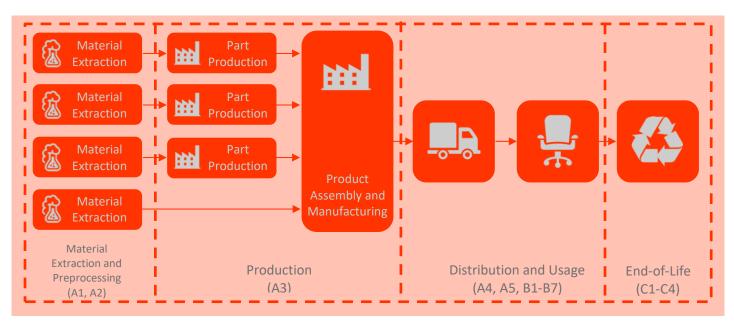
The table to the right details the materials included in a specific SKU for the product made in the United States, summarized in the chart below. In order to achieve the functional unit, 1 seating unit is required.



Material	Mass (kg)	Mass (%)	Resource
Polyamide 6 (PA6)	8.74	52.5%	Virgin Non-renewable
Steel	6.15	37.0%	Virgin Non-renewable and Recycled Content
Aluminum	0.82	4.9%	Recycled Content
Polyurethane Foam	0.62	3.7%	Virgin Non-renewable
Polyoxymethylene (POM)	0.12	0.7%	Virgin Non-renewable
Thermoplastic Polyurethane (TPU)	0.06	<1%	Virgin Non-renewable
Polypropylene (PP)	0.04	<1%	Virgin Non-renewable
High Density Polyethylene (HDPE)	0.04	<1%	Virgin Non-renewable
Acrylonitrile Butadiene Styrene (ABS)	0.03	<1%	Virgin Non-renewable
Other	0.02	<1%	Virgin Non-renewable
Total	16.64	100%	

Packaging*	Mass (kg)	Mass (%)	Resource
Corrugate	4.94	98.3%	Recycled Content
Polyethylene (PE) Bag	g 0.09	1.7%	Virgin Non-renewable
Tota	al 5.03	100%	

*Returnable/reusable shipping blankets also available

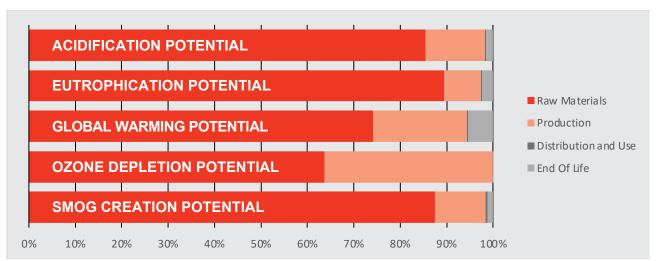


Life Cycle Impact Assessment - BIFMA PCR for Weighted Average Production of United States, United Kingdom, and China

Environmental Impacts were calculated using the GaBi software platform. Impact results according to the BIFMA PCR have been calculated using TRACI 2.1 characterization factors, as well as LCI indicators for primary energy and water usage. Results presented in this report are for 1 seat maintained for 1 individual for 10 years. Additionally, the results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

	LCIA Impact Category	Unit	Total	Raw Material Production	Product Production	Distribution and Retail	End of Life
8	Acidification Potential	kg SO ₂ eq	2.94E-01	2.51E-01	3.77E-02	8.31E-04	4.20E-03
*	Eutrophication Potential	kg N eq	3.45E-02	3.08E-02	2.74E-03	9.94E-05	8.02E-04
*	Global Warming Potential	kg CO₂ eq	1.04E+02	7.70E+01	2.11E+01	3.34E-01	5.55E+00
Sm	Photochemical Ozone Creation Potential (Smog)	kg O₃ eq	5.21E+00	4.56E+00	5.67E-01	1.86E-02	6.38E-02
6 °	Ozone Depletion Potential	kg CFC-11 eq	2.64E-10	1.68E-10	9.57E-11	7.51E-17	2.75E-15
	LCI Impact Category	Unit	Total	Raw Material Production	Product Production	Distribution and Retail	End of Life
*	Primary Energy Demand (Renewable and Non-Renewable)	MJ (net cal value)	2.05E+03	1.69E+03	3.43E+02	4.28E+00	1.78E+01
*	Fresh Water Consumption	kg	5.30E+02	4.34E+02	8.51E+01	7.97E-01	1.07E+01

Life Cycle Impacts of Verus Chairs



Reference Service Life Required

APPENDIX: EN 15804

In addition to the previous results, impact results according to EN 15804 have been calculated using CML characterization factors, as well as LCI indicators required. Results presented in this report are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

Modeling Assumptions

In order to comply with EN 15804, several modeling assumptions had to be altered from the previous BIFMA PCR-based results, as outlined here. The life cycle modules are aggregated differently according to the table below and Module D is included to calculate the benefits from the end-of-life scenarios including recycling materials, landfill gas capture, and waste-to-energy.

Functional Unit					
Parameter	Value				
Functional Unit	1 seat for 1 individual maintained for a 10-year period				
Number of Occupants	1				

A4: Transport to the Building Site								
Parameter	Value per functional unit							
Transportation Type	Diesel Truck							
Fuel Consumption	0.075 kg							
Distance	2253 km							
Capacity Utilization	61%							

A5: Installation in the Building							
Parameter	Value per functional unit						
Packaging Waste Produced	5.03 kg						

Parameter	Value per functional unit
Reference Service Life	10 Years
Design Application Parameters	Use as indicated in product brochure and warranty
Declared Product Properties	Properties given in product description on page 4

End-of	-Life
Parameter	Value per functional unit
Weight of Product Collected	21.7 kg
Weight to Recycling	7.2 kg
Weight to Energy Recovery	2.9 kg
Weight to Landfill	11.6 kg
Distance to Recycling	50 km
Distance to Energy Recovery	100 km
Distance to Landfill	50 km

Life Cycle Stages

The results are provided according to the following life cycle modules:

Module	Description	Module	Description	Module	Description
A1	Product Stage: Raw Material Supply	B1	Use Stage: Use	C1	EOL: Deconstruction
A2	Product Stage: Transport	B2	Use Stage: Maintenance	C2	EOL: Transport
А3	Product Stage: Manufacturing	В3	Use Stage: Repair	C3	EOL: Waste Processing
A4	Construction Process Stage: Transport	В4	Use Stage: Replacement	C4	EOL: Disposal
A5	Construction Process Stage: Installation	B5	Use Stage: Refurbishment	D	Benefits beyond system
		B6	Operational Energy Use		
		B7	Operational Water Use		

LCA Results - Weighted Average Production of United States, United Kingdom, and China

CML Results - 1 seat for 1 individual maintained for 10 Years

Impact Category	A1-A3	A4	A5	B1	B2	В3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP-elements [kg Sb eq]	3.48E-05	8.61E-08	1.45E-09	0.00E+00	8.54E-08	0.00E+00	5.96E-08	-3.02E-06							
ADP-fossil fuel [MJ]	1.19E+03	3.30E+00	1.47E-01	0.00E+00	3.35E+00	0.00E+00	1.13E+01	-1.11E+02							
AP [kg SO ₂ eq]	2.51E-01	5.80E-04	2.96E-05	0.00E+00	5.81E-04	0.00E+00	2.38E-03	-2.89E-02							
EP [kg Phosphate eq]	4.10E-02	1.59E-04	1.75E-05	0.00E+00	1.58E-04	0.00E+00	1.59E-03	-6.00E-03							
GWP [kg CO ₂ eq]	9.80E+01	2.79E-01	5.55E-02	0.00E+00	2.83E-01	0.00E+00	5.27E+00	-6.40E+00							
ODP [kg CFC 11 eq]	2.57E-10	4.76E-17	2.75E-17	0.00E+00	4.79E-17	0.00E+00	2.70E-15	-7.33E-13							
POCP [kg Ethene eq]	2.41E-02	-1.97E-04	7.09E-08	0.00E+00	-1.95E-04	0.00E+00	2.02E-04	-2.72E-03							

ADP=Abiotic Depletion Potential; AP=Acidification Potential; EP=Eutrophication Potential; GWP=Global Warming Potential; ODP=Ozone Depletion Potential; POCP=Photochemical ozone creation potential

Resource Use and Waste - 1 seat for 1 individual maintained for 10 Years

Impact Category	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	C3	C4	D
RPR _E [MJ]	2.28E+02	1.60E-01	1.02E-02	0.00E+00	1.58E-01	0.00E+00	8.59E-01	-6.77E+01							
RPR _M [MJ]	0.00E+00														
RPR _T [MJ]	2.28E+02	1.60E-01	1.02E-02	0.00E+00	1.58E-01	0.00E+00	8.59E-01	-6.77E+01							
NRPR _E [MJ]	1.80E+03	3.94E+00	1.68E-01	0.00E+00	3.99E+00	0.00E+00	1.28E+01	-1.66E+02							
NRPR _M [MJ]	0.00E+00														
NRPR _T [MJ]	1.80E+03	3.94E+00	1.68E-01	0.00E+00	3.99E+00	0.00E+00	1.28E+01	-1.66E+02							
SM [kg]	3.11E+00	0.00E+00													
RSF [MJ]	0.00E+00														
NRSF [MJ]	0.00E+00														
FW [m ³]	5.19E-01	6.90E-04	1.07E-04	0.00E+00	6.84E-04	0.00E+00	1.00E-02	-4.01E-02							
HWD [kg]	1.78E-06	3.31E-10	2.38E-11	0.00E+00	3.37E-10	0.00E+00	2.04E-09	-6.36E-08							
NHWD [kg]	2.55E+00	3.58E-04	1.23E-01	0.00E+00	3.57E-04	0.00E+00	1.23E+01	-4.18E-01							
RWD [kg]	3.40E-02	9.46E-06	1.74E-06	0.00E+00	9.40E-06	0.00E+00	1.65E-04	-3.91E-03							
CRU [kg]	0.00E+00														
MFR [kg]	1.51E+00	0.00E+00	7.14E-02	0.00E+00	7.14E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
MER [kg]	0.00E+00	0.00E+00	2.90E-02	0.00E+00	2.90E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
EE [MJ]	0.00E+00														

RPR_E=Renewable Primary Energy from Non-Materials; RPR_M =Renewable Primary Energy from Materials; RPR_M =Renewable Primary Energy from Materials; RPR_M =Renewable Primary Energy from Non-Materials; RPR_M =Renewable Primary Energy from Materials; RPR_T =Total Renewable Primary Energy from Materials; NRPR_T =Total Non-Renewable Primary Energy from Materials; NRSF=Use of Renewable Primary Energy; SM=Use of Secondary Materials; RSF=Use of Renewable Secondary Fuels; NRSF=Use of Non-Renewable Secondary Fuels; FW=Net Use of Fresh Water; HWD=Hazardous Waste Disposed; NHWD=Non-Hazardous Waste Disposed; RWD=Radioactive Waste Disposed; CRU=Components for Reuse; MFR=Materials for Recycling; MER=Materials for Energy Recovery; EE=Exported Energy