Aeron® Chair Plastic Base

Seating

Environmental Product Declaration

Date of Issue: January 27th, 2022

Date of Expiration: January 27th, 2027

Product Category Rules

BIFMA PCR for Seating, UNCPC 3811

INSIDE/INSIDE PCR Furniture, v1.1 and Horizontal PCR v1.2

ISO 14025/14040/14044 and EN 15804

Functional Unit

1 seat maintained for a 10-year period (1 Aeron 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, the specifics of the product modeled, and the software tool used to conduct the study.

HermanMiller

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NSF Certified Environmental Product Declaration www.nsf.org

Environmental Product Declaration

Aeron® Chair Plastic Base

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	EPD10685
Declared Product and Functional Unit	Aeron Chair (product codes starting with AER1 or AER2 with base finish options: dark mineral (DVP), dark carbon (DCR), graphite (G1) or black (BK) Functional Unit: 1 unit of seating for 1 individual maintained for 10 years
Reference PCR and Version Number	BIFMA PCR for Seating INSIDE/INSIDE Horizontal PCR v1.2 INSIDE/INSIDE PCR Furniture v1.1
Product's intended Application and Use	Office Chair
Product RSL	10 years
Markets of Applicability	North/South America, EMEA, APAC
Date of Issue	January 27th, 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	2018
LCA Software and Version Number	GaBi 10.5.0.78
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 INSIDE/INSIDE Horizontal PCR v1.2, based on CEN Norm EN 15804 (2012), serves as the core PCR, with additional considerations from the INSIDE/INSIDE PCR Furniture and the BIFMA PCR for Seating. ☐ Internal ☒ External	Tony Favilla tfavilla@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
References	BIFMA PCR for Seating: UNCPC 3811. Version 3 ISO 14025/40/44; 2006 EN 15804:2012+A1; 2013 INSIDE/INSIDE Horizontal PCR v1.2 INSIDE/INSIDE PCR Furniture v1.1 Herman Miller Background Report for LCA/EPD Creation Tool v1.6

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.

Aeron® Chair Plastic Base

Product Description

Designed by Bill Stumpf and Don Chadwick
Aeron office chair revolutionized office seating with its defining design qualities: the pioneering Pellicle suspension material and its patented PostureFit SL back support, which affords the ideal sit — chest open, shoulders back, pelvis tilted slightly forward. Combining a deep knowledge of human-centered design with cutting-edge technology, the classic Aeron chair is engineered with state-of-the-art adjustability, from the arms, seat height, depth, and recline, to help you maintain the optimal seating posture so you can focus on the task at hand. And it comes available in three chair sizes, offering the most comfort to the largest range of users.

With updates that include a more refined tilt mechanism, adjustable PostureFit SL, and the comprehensive support of 8Z Pellicle suspension, the new Aeron performs better than ever before—so you can too.

This document relates to Aeron Chairs with a plastic base. Aeron Chairs with a dark mineral (DVP), dark carbon (DCR), graphite (G1), or black (BK) base finish are covered under this document.

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 Locations
- 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 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 %	53%	52%	51%
Post-Consumer	31%	36%	31%
Pre-Consumer	22%	16%	20%
Recyclability (max %) *	90%	90%	90%

*Based on availability of recycling facilities.

Environmental Certifications**
BIFMA level™ 3
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/aeron-chairs/pro-resources/
**This data is specific to US-produced products. For data on UK- and CN-produced products, please contact your sales representative or visit

Aeron® Chair Plastic Base

www.hermanmiller.com

MATERIAL DECLARATION

Functional Unit

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

Reference Flow and Product Specifications

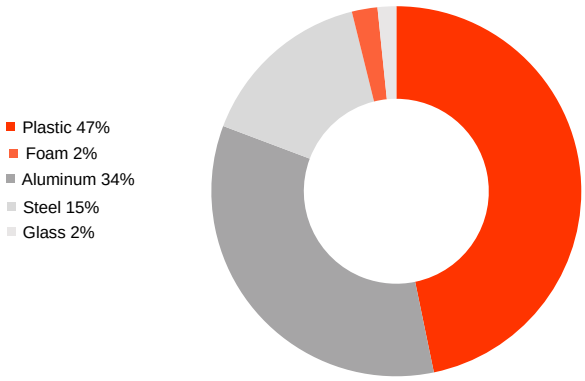
One Aeron Chair (product number AER1B23AWALPG1G1G1BBBK23103) in a medium (B) size, standard-height, with a tilt limiter and seat angle, height-adjustable and pivot arms, adjustable posturefit, and hard casters was modeled for this EPD. This office chair is determined to be a representative product based on sales of the variations and is considered to be a conservative estimate. The results presented on the subsequent pages consist of the weighted average impacts of Aeron 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

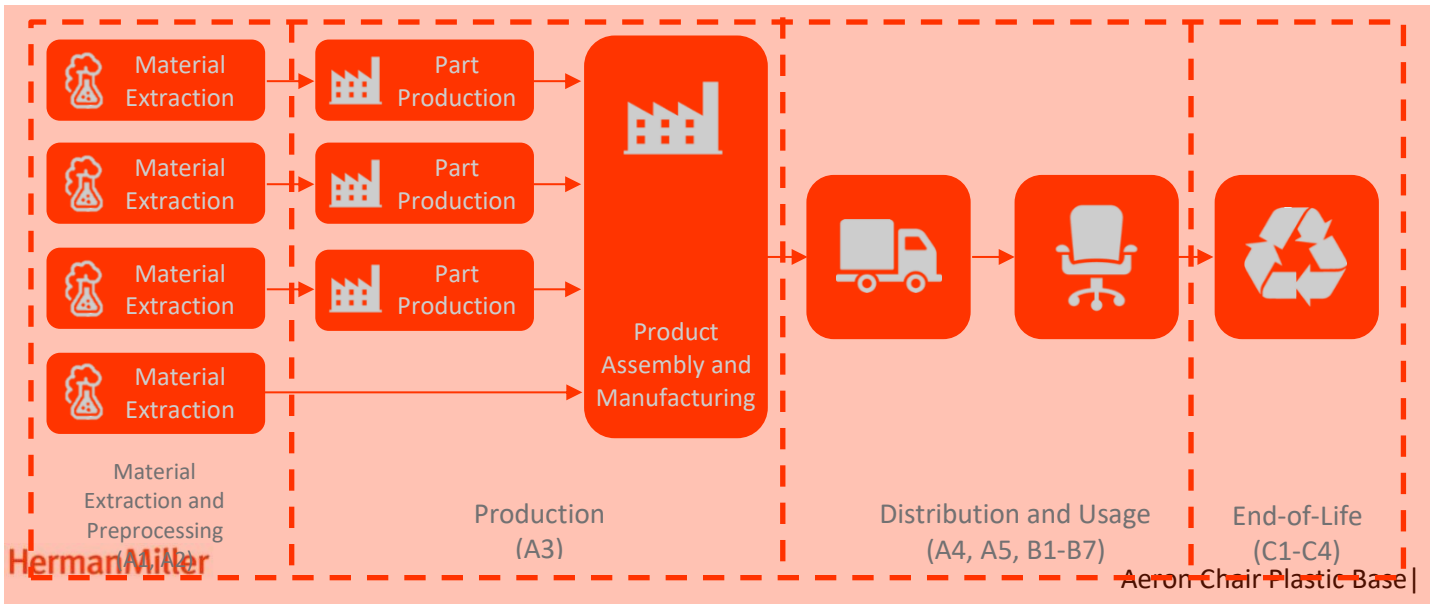
The table to the right details the materials included in a specific SKU for the product made in the United States, summarized in the chart below. In order to achieve the functional unit, 1 product is required.



Material	Mass (kg)	Mass (%)	Resource
Polyamide 6 (PA6)	6.72	36%	Virgin Non-renewable and Recycled Content
Aluminum	6.29	34%	Recycled Content
Steel	2.80	15%	Recycled Content
Thermoplastic Ether Ester Elastomer	0.51	3%	Virgin Non-renewable
Polyoxymethylene (POM)	0.41	2%	Virgin Non-renewable
Polyurethane Foam	0.42	2%	Virgin Non-renewable
Fiberglass	0.30	2%	Virgin Non-renewable
Copolyester Ether (COPE)	0.29	2%	Virgin Non-renewable
Polypropylene (PP)	0.26	1%	Virgin Non-renewable
Stainless Steel	0.24	1%	Recycled Content
Recycled Polyethylene Terephthalate (rPET)	0.20	1%	Recycled Content
Other Materials	0.30	1%	Virgin Non-renewable and Recycled Content
Total	**18.74**	**100%**	

Packaging*	Mass (kg)	Mass (%)	Resource
Corrugate	3.58	97%	Recycled Content
PE Film	0.09	2%	Virgin Non-renewable
PP Banding (Polypropylene)	0.03	1%	Virgin Non-renewable
Total	**3.70**	**100%**	

*Returnable/reusable shipping blankets also available



Overview of Life Cycle Stages

Aeron® Chair Plastic Base

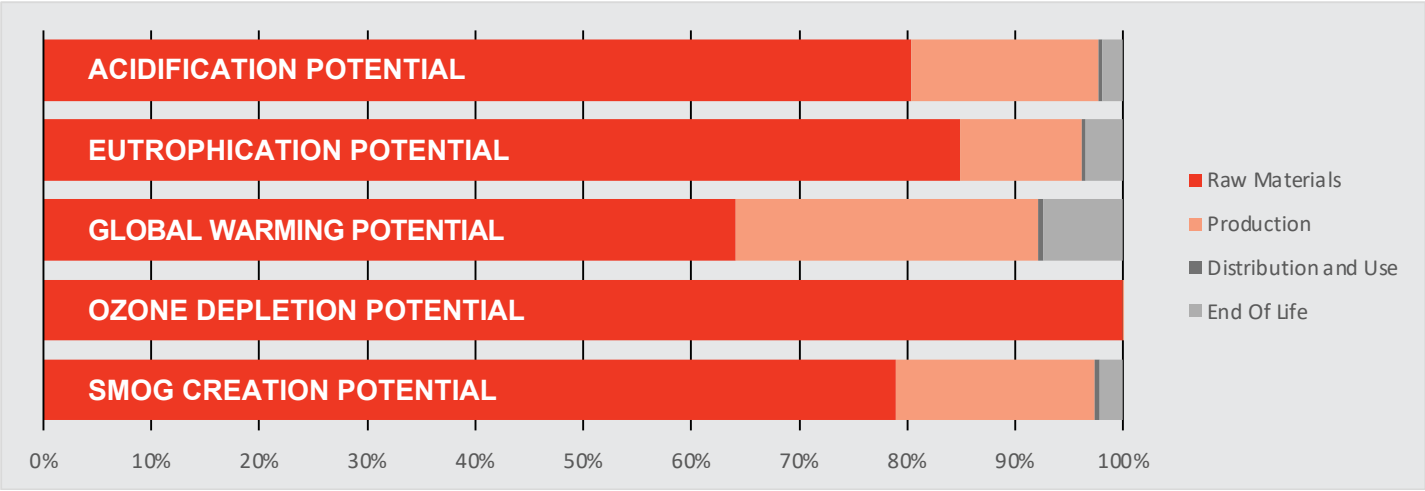
Life Cycle Impact Assessment – BIFMA PCR for Weighted Average Production of United States, United Kingdom, and China

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 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
Acidification Potential	kg SO_2 eq	2.29E-01	1.84E-01	3.97E-02	8.35E-04	4.45E-03
Eutrophication Potential	kg N eq	2.35E-02	2.00E-02	2.64E-03	9.97E-05	8.05E-04
Global Warming Potential	kg CO_2 eq	7.32E+01	4.69E+01	2.05E+01	3.34E-01	5.43E+00
Photochemical Ozone Creation Potential (Smog)	kg O_3 eq	3.36E+00	2.66E+00	6.18E-01	1.87E-02	7.09E-02
Ozone Depletion Potential	kg CFC-11 eq	4.80E-07	4.80E-07	5.55E-11	7.64E-17	2.87E-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)	1.45E+03	1.10E+03	3.32E+02	4.29E+00	1.80E+01
Fresh Water Consumption	kg	4.21E+02	3.16E+02	9.23E+01	8.08E-01	1.17E+01

Life Cycle Impacts of Aeron



Aeron® Chair Plastic Base

APPENDIX: INSIDE/INSIDE PCR

In addition to the previous results, impact results according to the INSIDE/INSIDE PCR Furniture have been calculated using CML characterization factors, as well as LCI indicators required by EN 15804. 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 the INSIDE/INSIDE PCR Furniture, several modeling assumptions had to be altered from the previous BIFMA PCR-based results, as outlined here. The transportation to customer has been reduced to 1km by truck, the expected periods for modules B1, B2, and B3 are 1 year, the end-of-life scenarios are based on specific PCR requirements, 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. Due to these modeling assumption differences with the BIFMA PCR, the results shown here are not comparable with the results presented previously.

Functional Unit

Parameter	Value
Declared Unit	1 Unit
Number of Occupants	1
Reference Service Life Required	10 years

A4: Transport to the Building Site

Parameter	Value per functional unit
Transportation Type	Diesel Truck
Fuel Consumption	3.49e-04 kg
Distance	1 km for results calculation (1500 km estimated value)
Capacity Utilization	61%

A5: Installation in the Building

Parameter	Value per functional unit
Packaging Waste Produced	3.70 kg

Reference Service Life

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	22.2 kg
Weight to Recycling	4.9 kg
Weight to Energy Recovery	3.5 kg
Weight to Landfill	13.8 kg
Distance to Recycling	50 km
Distance to Energy Recovery	100 km
Distance to Landfill	50 km
The values above represent the disposal of a specific SKU for the product made in the United States.	

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
A3	Product Stage: Manufacturing	**B3**	Use Stage: Repair	**C3**	EOL: Waste Processing
A4	Construction Process Stage: Transport	**B4**	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 maintained for 10 Years

Impact Category	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP-elements [kg Sb eq]	1.85E-04	8.63E-08	1.72E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.62E-08	0.00E+00	8.57E-08	-3.55E-06
ADP-fossil fuel [MJ]	8.38E+02	3.30E+00	1.46E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.53E+00	0.00E+00	1.11E+01	-6.85E+01
AP [kg SO_2 eq]	2.07E-01	5.81E-04	3.18E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.97E-04	0.00E+00	2.59E-03	-1.85E-02
EP [kg Phosphate eq]	2.74E-02	1.59E-04	1.75E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.61E-04	0.00E+00	1.58E-03	-4.08E-03
GWP [kg CO_2 eq]	6.74E+01	2.79E-01	5.43E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.96E-01	0.00E+00	5.14E+00	-3.36E+00
ODP [kg CFC 11 eq]	4.41E-07	4.77E-17	2.87E-17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.05E-17	0.00E+00	2.82E-15	-5.29E-13
POCP [kg Ethene eq]	1.84E-02	-1.97E-04	1.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.98E-04	0.00E+00	2.16E-04	-1.64E-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 maintained for 10 years

Impact Category	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
RPR_E [MJ]	1.96E+02	1.60E-01	1.10E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.61E-01	0.00E+00	9.40E-01	-4.83E+01
RPR_M [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RPR_T [MJ]	1.96E+02	1.60E-01	1.10E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.61E-01	0.00E+00	9.40E-01	-4.83E+01
$NRPR_E$ [MJ]	1.23E+03	3.95E+00	1.69E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.17E+00	0.00E+00	1.28E+01	-1.06E+02
$NRPR_M$ [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
$NRPR_T$ [MJ]	1.23E+03	3.95E+00	1.69E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.17E+00	0.00E+00	1.28E+01	-1.06E+02
SM [kg]	1.03E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m^3]	4.09E-01	6.91E-04	1.17E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.87E-04	0.00E+00	1.10E-02	-2.75E-02
HWD [kg]	1.83E-06	3.32E-10	2.24E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.47E-10	0.00E+00	1.89E-09	-4.54E-08
NHWD [kg]	2.31E+00	3.58E-04	1.51E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.68E-04	0.00E+00	1.51E+01	-2.94E-01
RWD [kg]	3.23E-02	9.48E-06	1.83E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.59E-06	0.00E+00	1.73E-04	-2.61E-03
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR [kg]	1.34E+00	0.00E+00	4.75E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.75E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER [kg]	0.00E+00	0.00E+00	3.39E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.39E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

RPR_E=Renewable Primary Energy from Non-Materials; RPR_M =Renewable Primary Energy from Materials; RPR_T =Total Renewable Primary Energy; $NRPR_E$=Non-Renewable Primary Energy from Non-Materials; $NRPR_M$ =Non-Renewable Primary Energy from Materials; $NRPR_T$ =Total Non-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