



# Mirra<sup>®</sup> 2 Chair

Seating



## Environmental Product Declaration

Date of Issue: April 6<sup>th</sup>, 2020

Date of Expiration: April 6<sup>th</sup>, 2025

### 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 Mirra 2 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.

Environmental Product Declaration

# Mirra<sup>®</sup> 2 Chair

|  |  |   |
|--|--|---|
| Program Operator   | NSF Certification LLC<br>789 N. Dixboro, Ann Arbor, MI 48105<br>www.nsf.org  |  |
| Manufacturer Name and Address  | Herman Miller<br>855 East Main Ave. PO Box 302<br>Zeeland, MI 49464-0302 USA   |   |
| Declaration Number   | EPD10352   |   |
| Declared Product and Functional Unit   | Mirra 2 Chair<br>Functional Unit: 1 unit of seating for 1 individual maintained for 10 years   |   |
| Reference PCR and Version Number   | BIFMA PCR for Seating<br>INSIDE/INSIDE Horizontal PCR v1.2<br>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  | April 6 <sup>th</sup> , 2020, updated August 6 <sup>th</sup> , 2020  |   |
| 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 9.5.0.43  |   |
| LCI Database and Version Number  | GaBi Database, Service Pack 40   |   |
| LCIA Methodology and Version Number  | TRACI 2.1<br>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.<br><input type="checkbox"/> Internal <input checked="" type="checkbox"/> External   | Jenny Oorbeck<br>joorbeck@nsf.org<br>   |   |
| 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<br>Matt Van Duinen - WAP Sustainability Consulting<br>matt@wapsustainability.com  |   |
| This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:   | Jack Geibig - EcoForm<br>jgeibig@ecoform.com<br>  |   |
| References   | BIFMA PCR for Seating: UNCPC 3811. Version 3<br>ISO 14025/40/44; 2006<br>EN 15804:2012+A1; 2013<br>INSIDE/INSIDE Horizontal PCR v1.2<br>INSIDE/INSIDE PCR Furniture v1.1<br>Herman Miller Background Report for LCA/EPD Creation Tool v1.6 |   |
| <p>Limitations:<br/>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.</p> |  |   |

## Product Description

Designed by Studio 7.5

Mirra 2 moves with you, at one with your body. When you sit, Mirra 2 adapts to you instantly. Shift, and the Butterfly Back™ and AireWeave™ 2 suspension seat dynamically support even your slightest movements. Recline, and the reinvented Harmonic™ tilt provides a smooth, balanced feel.

An athletic attitude and plenty of opportunities for personalization define Mirra 2's lean, sophisticated design. The emphasis on performance is visible. The Butterfly Back, a hybrid structure that merges a fabric layer with polymer veins, makes the chair more responsive, while bringing visual lightness to any environment.



### 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

### 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

### 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\*\*

53% Recycled Content

24% Post Consumer

29% Pre-Consumer

Up to 92% Recyclability \*

\*Based on availability of recycling facilities.

### Environmental Certifications\*\*

BIFMA level™ 3

CRADLE TO CRADLE CERTIFIED™ Bronze

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/mirra-2-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](http://www.hermanmiller.com)

# Mirra<sup>®</sup> 2 Chair

## 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 Mirra 2 Chair (product number MRF121AWAPN2G1C9G1BK1A703) with adjustable height, back, arms, and seat, aluminum base, casters, PostureFit and butterfly back 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.

### System Boundary

Cradle-to-Grave

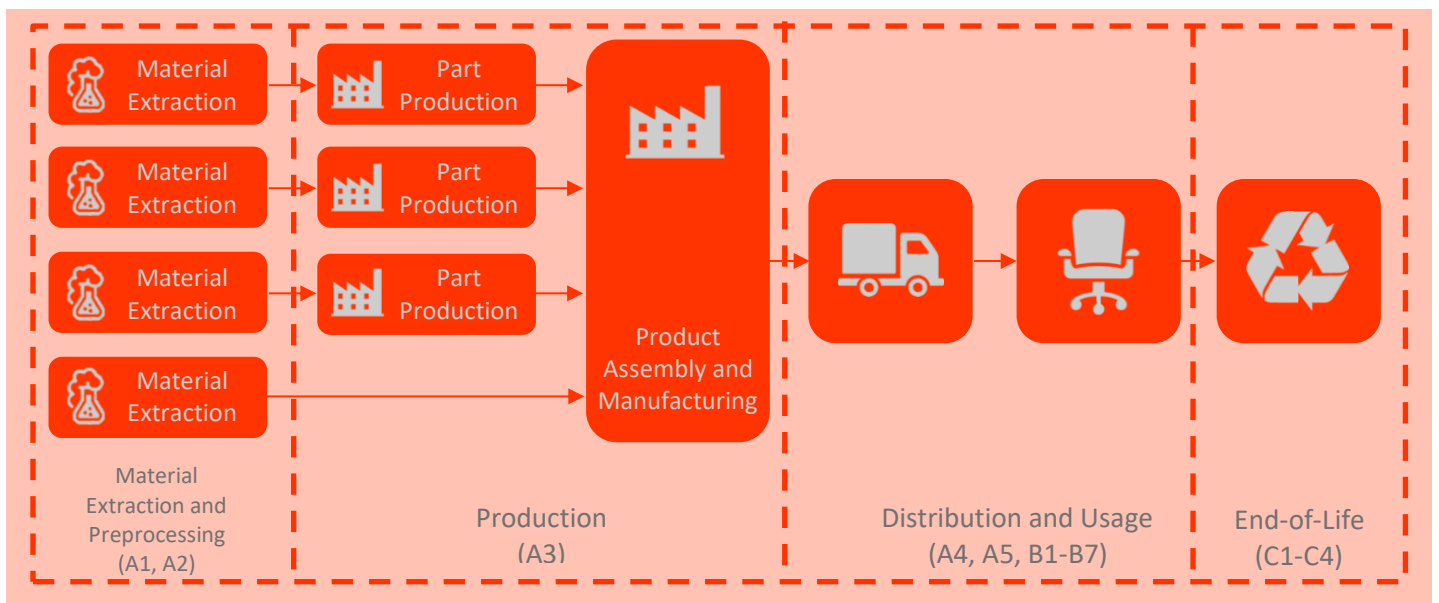
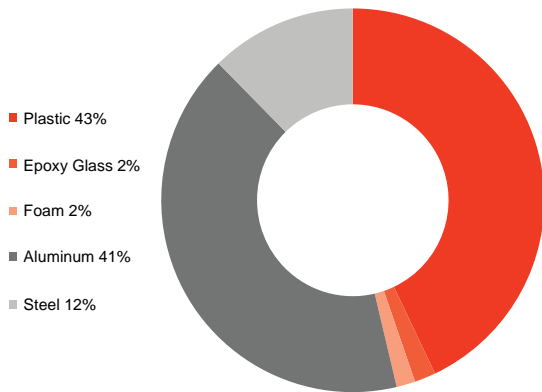
### Content Declaration

The table to the right details the materials included in the product, summarized in the chart below. In order to achieve the functional unit, 1 product is required.

| Material                         | Mass (kg)   | Mass (%)    | Resource                                  |
|----------------------------------|-------------|-------------|---|
| Aluminum                         | 6.72        | 41%         | Recycled Content                          |
| Copolyester Ether (COPE)         | 0.09        | 1%          | Virgin Non-renewable                      |
| Epoxy Glass Filled               | 0.29        | 2%          | Virgin Non-renewable                      |
| Polyamide 6 (PA6)                | 4.62        | 28%         | Virgin Non-renewable and Recycled Content |
| Polyamide 6/6 (PA66)             | 0.05        | 0%          | Virgin Non-renewable                      |
| Polyethylene terephthalate (PET) | 0.12        | 1%          | Virgin Non-renewable                      |
| Polyoxymethylene (POM)           | 0.49        | 3%          | Virgin Non-renewable                      |
| Polypropylene (PP)               | 1.00        | 6%          | Virgin Non-renewable                      |
| Polyurethane (PUR)               | 0.26        | 2%          | Virgin Non-renewable                      |
| Polymethyl methacrylate (PMMA)   | 0.31        | 2%          | Virgin Non-renewable                      |
| Steel                            | 2.01        | 12%         | Recycled Content                          |
| Thermoplastic Elastomer (TPE)    | 0.30        | 2%          | Virgin Non-renewable                      |
| <b>Total</b>                     | <b>16.3</b> | <b>100%</b> |   |

| Packaging*                 | Mass (kg)   | Mass (%)    | Resource             |
|----------------------------|-------------|-------------|----------------------|
| Corrugate                  | 4.80        | 99%         | Recycled Content     |
| PE Film                    | 0.15        | 1%          | Virgin Non-renewable |
| PP Banding (Polypropylene) | 0.03        | 0%          | Virgin Non-renewable |
| <b>Total</b>               | <b>4.98</b> | <b>100%</b> |                      |

\*Returnable/reusable shipping blankets also available



Overview of Life Cycle Stages

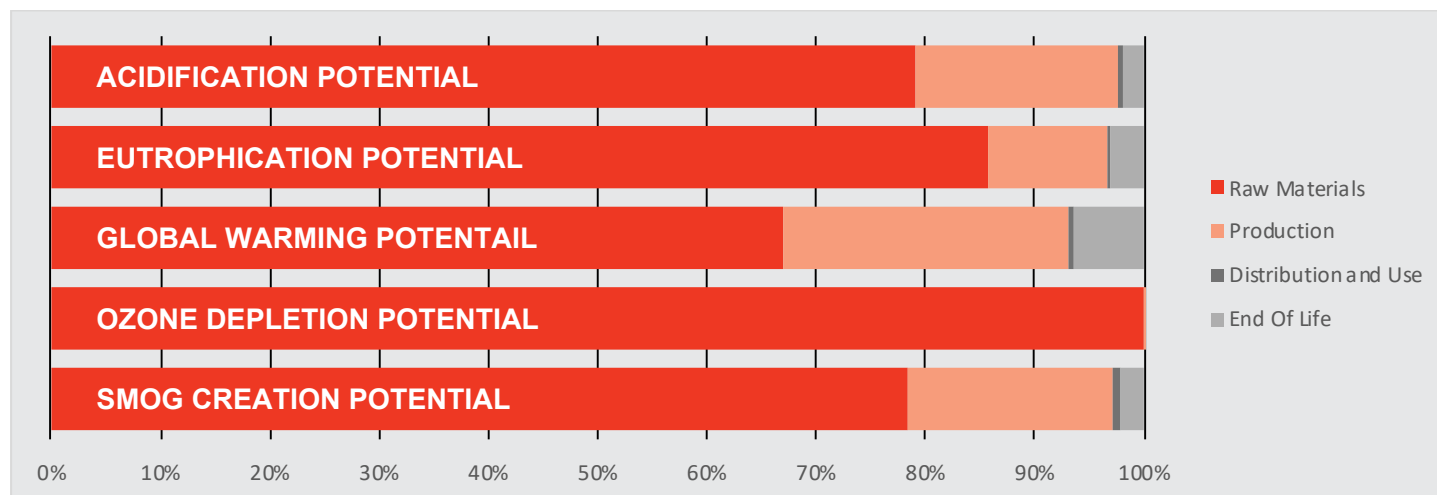
# Mirra<sup>®</sup> 2 Chair

## Life Cycle Impact Assessment – BIFMA PCR for United States Production

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 <sub>2</sub> eq | 2.09E-01 | 1.65E-01                | 3.90E-02           | 8.33E-04                | 4.00E-03    |
|  Eutrophication Potential                              | kg N eq               | 2.27E-02 | 1.94E-02                | 2.48E-03           | 9.97E-05                | 6.82E-04    |
|  Global Warming Potential                              | kg CO <sub>2</sub> eq | 6.92E+01 | 4.63E+01                | 1.82E+01           | 3.13E-01                | 4.47E+00    |
|  Photochemical Ozone Creation Potential (Smog)         | kg O <sub>3</sub> eq  | 2.92E+00 | 2.29E+00                | 5.47E-01           | 1.85E-02                | 6.49E-02    |
|  Ozone Depletion Potential                             | kg CFC-11 eq          | 2.83E-07 | 2.83E-07                | 3.54E-11           | 5.20E-17                | 2.32E-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)    | 1.46E+03 | 1.15E+03                | 2.92E+02           | 4.13E+00                | 1.57E+01    |
|  Fresh Water Consumption                             | kg                    | 3.69E+02 | 2.87E+02                | 7.14E+01           | 7.15E-01                | 1.03E+01    |

### Life Cycle Impacts of Mirra 2



**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     | 3.45e-04 kg   |
| Distance             | 1 km for results calculation<br>(1500 km estimated value) |
| Capacity Utilization | 61%   |

A5: Installation in the Building

| Parameter                | Value per functional unit |
|--------------------------|---------------------------|
| Packaging Waste Produced | 4.98 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 | 16.3 kg                   |
| Weight to Recycling         | 1.5 kg                    |
| Weight to Energy Recovery   | 3.1 kg                    |
| Weight to Landfill          | 11.7 kg                   |
| Distance to Recycling       | 50 km                     |
| Distance to Energy Recovery | 100 km                    |
| Distance to Landfill        | 50 km                     |

**Environmental Cost Indicators**

To achieve a single environmental cost indicator for environmental impact, it is necessary to value and combine scores from the environmental indicators in use. Utilizing the INSIDE/INSIDE methodology found in the v1.2 Horizontal PCR, the Environmental Cost Indicators are found below:

- United States Production - € 4.30
- United Kingdom Production - € 5.57

**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 – United States Production

CML Results – United States Production – 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]     | 3.64E-05 | 4.62E-08  | 1.21E-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 | 4.57E-08  | 0.00E+00 | 7.51E-08 | -1.79E-06 |
| ADP-fossil fuel [MJ]        | 1.16E+03 | 3.81E+00  | 1.43E-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 | 3.77E+00  | 0.00E+00 | 1.05E+01 | -1.08E+02 |
| AP [kg SO <sub>2</sub> eq]  | 1.91E-01 | 5.89E-04  | 2.90E-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 | 5.83E-04  | 0.00E+00 | 2.32E-03 | -2.14E-02 |
| EP [kg Phosphate eq]        | 2.54E-02 | 1.58E-04  | 1.47E-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 | 1.56E-04  | 0.00E+00 | 1.31E-03 | -4.82E-03 |
| GWP [kg CO <sub>2</sub> eq] | 6.45E+01 | 2.69E-01  | 4.47E-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 | 2.66E-01  | 0.00E+00 | 4.21E+00 | -3.25E+00 |
| ODP [kg CFC 11 eq]          | 2.61E-07 | 2.88E-17  | 2.32E-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 | 2.85E-17  | 0.00E+00 | 2.29E-15 | -7.04E-13 |
| POCP [kg Ethene eq]         | 1.66E-02 | -1.94E-04 | 2.50E-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 | -1.92E-04 | 0.00E+00 | 2.17E-04 | -1.83E-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 – United States Production – 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 <sub>E</sub> [MJ]  | 1.93E+02 | 1.60E-01 | 9.41E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.58E-01 | 0.00E+00 | 7.84E-01 | -6.29E+01 |
| RPR <sub>M</sub> [MJ]  | 0.00E+00 | 0.00E+00 | 9.41E-03 | 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 <sub>T</sub> [MJ]  | 1.93E+02 | 1.60E-01 | 1.47E-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 | 1.58E-01 | 0.00E+00 | 7.84E-01 | -6.29E+01 |
| NRPR <sub>E</sub> [MJ] | 1.25E+03 | 3.83E+00 | 1.47E-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 | 3.79E+00 | 0.00E+00 | 1.09E+01 | -1.16E+02 |
| NRPR <sub>M</sub> [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 <sub>T</sub> [MJ] | 1.25E+03 | 3.83E+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 | 3.79E+00 | 0.00E+00 | 1.09E+01 | -1.16E+02 |
| SM [kg]                | 8.83E+00 | 0.00E+00 | 1.03E-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 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| RSF [MJ]               | 0.00E+00 | 0.00E+00 | 1.76E-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 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| NRSF [MJ]              | 0.00E+00 | 0.00E+00 | 1.60E-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 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| FW [m <sup>3</sup> ]   | 3.58E-01 | 7.15E-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 | 0.00E+00 | 7.08E-04 | 0.00E+00 | 9.60E-03 | -3.27E-02 |
| HWD [kg]               | 1.03E-06 | 6.58E-08 | 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 | 6.51E-08 | 0.00E+00 | 5.28E-08 | -8.46E-08 |
| NHWD [kg]              | 1.81E+00 | 2.67E-04 | 1.18E-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 | 2.64E-04 | 0.00E+00 | 1.40E+01 | -4.04E-01 |
| RWD [kg]               | 2.98E-02 | 6.91E-06 | 1.40E-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 | 6.84E-06 | 0.00E+00 | 1.54E-04 | -2.84E-03 |
| CRU [kg]               | 0.00E+00 | 0.00E+00 | 1.61E-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 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| MFR [kg]               | 1.03E+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 | 6.79E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| MER [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 | 3.10E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| EE [MJ]                | 0.00E+00 | 0.00E+00 | 3.10E-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 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |

RPR<sub>E</sub>=Renewable Primary Energy from Non-Materials; RPR<sub>M</sub> =Renewable Primary Energy from Materials; RPR<sub>T</sub> =Total Renewable Primary Energy; NRPR<sub>E</sub>=Non-Renewable Primary Energy from Non-Materials; NRPR<sub>M</sub> =Non-Renewable Primary Energy from Materials; NRPR<sub>T</sub> =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

**LCA Results – United Kingdom Production**

**CML Results – United Kingdom Production – 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]     | 1.70E-04 | 4.49E-08  | 1.20E-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 | 4.69E-08  | 0.00E+00 | 7.30E-08 | -9.07E-07 |
| ADP-fossil fuel [MJ]        | 1.34E+03 | 3.73E+00  | 1.48E-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 | 4.51E+00  | 0.00E+00 | 1.03E+01 | -5.45E+01 |
| AP [kg SO <sub>2</sub> eq]  | 2.86E-01 | 5.75E-04  | 2.94E-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 | 6.50E-04  | 0.00E+00 | 2.29E-03 | -1.72E-02 |
| EP [kg Phosphate eq]        | 2.89E-02 | 1.54E-04  | 1.44E-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 | 1.69E-04  | 0.00E+00 | 1.27E-03 | -4.11E-03 |
| GWP [kg CO <sub>2</sub> eq] | 7.73E+01 | 2.63E-01  | 4.38E-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 | 3.20E-01  | 0.00E+00 | 4.06E+00 | 6.43E-02  |
| ODP [kg CFC 11 eq]          | 1.32E-08 | 2.84E-17  | 2.30E-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 | 4.33E-17  | 0.00E+00 | 2.26E-15 | -7.03E-13 |
| POCP [kg Ethene eq]         | 2.15E-02 | -1.90E-04 | 5.00E-08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -2.08E-04 | 0.00E+00 | 2.13E-04 | -1.28E-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 – United Kingdom Production – 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 <sub>E</sub> [MJ]  | 2.13E+02 | 1.55E-01 | 9.46E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.74E-01 | 0.00E+00 | 7.71E-01 | -6.25E+01 |
| RPR <sub>M</sub> [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 <sub>T</sub> [MJ]  | 2.13E+02 | 1.55E-01 | 9.46E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.74E-01 | 0.00E+00 | 7.71E-01 | -6.25E+01 |
| NRPR <sub>E</sub> [MJ] | 1.43E+03 | 3.74E+00 | 1.52E-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 | 4.53E+00 | 0.00E+00 | 1.07E+01 | -6.12E+01 |
| NRPR <sub>M</sub> [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 <sub>T</sub> [MJ] | 1.43E+03 | 3.74E+00 | 1.52E-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 | 4.53E+00 | 0.00E+00 | 1.07E+01 | -6.12E+01 |
| SM [kg]                | 6.89E+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  |
| 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 <sup>3</sup> ]   | 2.83E-01 | 6.96E-04 | 1.01E-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 | 6.95E-04 | 0.00E+00 | 9.42E-03 | -2.88E-02 |
| HWD [kg]               | 1.23E-06 | 6.40E-08 | 1.16E-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 | 6.35E-08 | 0.00E+00 | 5.24E-08 | -6.48E-08 |
| NHWD [kg]              | 2.46E+00 | 2.61E-04 | 1.39E-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 | 3.12E-04 | 0.00E+00 | 1.39E+01 | -4.42E-01 |
| RWD [kg]               | 3.18E-02 | 6.75E-06 | 1.59E-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 | 8.02E-06 | 0.00E+00 | 1.51E-04 | -2.64E-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]               | 7.35E-01 | 0.00E+00 | 6.28E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.28E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| MER [kg]               | 0.00E+00 | 0.00E+00 | 3.08E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.08E+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<sub>E</sub>=Renewable Primary Energy from Non-Materials; RPR<sub>M</sub> =Renewable Primary Energy from Materials; RPR<sub>T</sub> =Total Renewable Primary Energy; NRPR<sub>E</sub>=Non-Renewable Primary Energy from Non-Materials; NRPR<sub>M</sub> =Non-Renewable Primary Energy from Materials; NRPR<sub>T</sub> =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