



\* Product pictured is not the exact style of the product studied in this document.

## Move

**Move** stackable side chairs are a durable solution available with a variety of options.

The model chosen for analysis is the most representative line (reference # 490410) from the Move range. Standard features on this model include:

- Plastic Back
- Arms
- Upholstered Seat: Buzz 2 fabric

This EPD – Environmental Product Declaration – is valid for the above reference.  
Date of Critical Review: 03/2018

# EPD Overview

## Final Assembly Location

Final assembly of Move is in Reynosa, Mexico by Steelcase for the Americas Market.

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## Goal and Scope >

The potential environmental impacts of Move (incl. packaging) throughout its entire life cycle – including raw materials extraction, production, transport, use, and end of life – were assessed using Life Cycle Assessment (LCA – ISO 14040 / 14044) in 03/2018.

## Life Cycle Inventory >

- list of materials
- inventory of resources
- inventory of emissions

## Life Cycle Impact Assessment >

- environmental impacts

## Product Environmental Profile (PEP) >

## Verification Process And References >

## Contact >

# Goal and Scope

The measurements found during the life cycle assessment help to guide best practice decisions and are the starting point for the continuous improvement.

Both method and product may be subject to modifications, and the figures are subject to change without notice.

At Steelcase, our goal is to continuously improve the environmental performance of our products, and to consider each phase of the life cycle. Our findings in one product life cycle assessment may also lead to better decisions or best practices for other product lines.

The potential environmental impacts of Move (incl. packaging) throughout its entire life cycle – including raw materials extraction, production, transport, use, and end of life – were assessed using Life Cycle Assessment (LCA – ISO 14040 / 14044) in 03/2018.

## **Materials**

This phase includes materials extraction and processing into useable materials. Benefits of recycled materials are considered here.

## **Production**

This phase consists of all manufacturing and assembly taking place at Steelcase or their suppliers and sub-suppliers.

## **Transport**

Upstream and downstream transports are considered, from materials extraction until handling for end of life.

## **Use**

The use phase is when the finished product is in its intended function – no significant environmental impacts occur.

## **End of life**

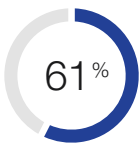
End-of-life product recyclability and local waste management infrastructure are considered. Benefits from recycling are not considered in this phase to avoid double counting.

The functional unit – i.e. the quantified performance of the product for use as a reference unit – used in the Life Cycle Assessment was chosen as provide one unit of seating to seat one individual, maintained for a 10 year period.

Environmental declarations may not be effectively comparable if evaluated against other products, or if the LCA methods were completed by different practitioners using different models.

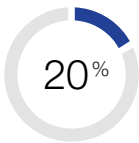
# Life Cycle Inventory

Move materials composition is listed below.\*



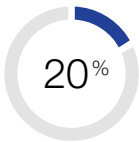
**METALS**

|       | kg  | lb   | %    |
|-------|-----|------|------|
| Steel | 4.9 | 10.8 | 60.8 |



**PLASTICS**

|                    | kg   | lb   | %    |
|--------------------|------|------|------|
| Polypropylene (PP) | 1.5  | 3.3  | 18.4 |
| Synthetic rubber   | 0.1  | 0.1  | 0.8  |
| Nylon 66 (PA66)    | <0.1 | <0.1 | 0.3  |
| Nylon 6 (PA6)      | <0.1 | <0.1 | 0.1  |



**OTHER MATERIALS**

|                   | kg  | lb  | %    |
|-------------------|-----|-----|------|
| Polyurethane foam | 1.4 | 3.1 | 17.6 |
| Polyester fabric  | 0.2 | 0.4 | 2.0  |



**PACKAGING**

|                                 | kg  | lb  | %    |
|---------------------------------|-----|-----|------|
| Cardboard                       | 4.2 | 9.3 | 80.6 |
| Low density polyethylene (LDPE) | 0.8 | 1.8 | 16.3 |
| Polypropylene (PP)              | 0.2 | 0.4 | 3.1  |

**TOTAL WEIGHT – incl. packaging                    13.3**

\*The list of materials does not contain all materials used in the product. (e.g. adhesives, coatings, residuals, etc.).

## RESOURCES

This table inventories the most important energy and water consumption throughout the entire life cycle of Move.

### RENEWABLE ENERGY

|            | MJ   |
|------------|------|
| Biomass    | 49.1 |
| Hydropower | 26.6 |
| Wind       | 2.61 |

### NON-RENEWABLE ENERGY

|      | MJ  |
|------|-----|
| Gas  | 516 |
| Oil  | 325 |
| Coal | 178 |

### WATER

|                  | m <sup>3</sup> |
|------------------|----------------|
| Water withdrawal | 0.162          |

## EMISSIONS

This table inventories the most important emissions to air, soil and water throughout the entire life cycle of Move.

### EMISSIONS TO AIR

|                                             | kg    |
|---------------------------------------------|-------|
| CO <sub>2</sub> – Carbon dioxide (fossil)   | 63.8  |
| CO <sub>2</sub> – Carbon dioxide (biogenic) | 5.96  |
| CO – Carbon monoxide (fossil)               | 0.290 |
| CH <sub>4</sub> – Methane (fossil)          | 0.214 |
| CH <sub>4</sub> – Methane (biogenic)        | 0.195 |
| SO <sub>2</sub> – Sulfur dioxide            | 0.180 |
| NO <sub>x</sub> – Nitrogen oxides           | 0.170 |

### EMISSIONS TO SOIL

|                            | kg    |
|----------------------------|-------|
| Cl <sup>-</sup> – Chloride | 0.008 |
| Oils                       | 0.024 |
| Na – Sodium                | 0.005 |

### EMISSIONS TO WATER

|                                           | kg    |
|-------------------------------------------|-------|
| Cl <sup>-</sup> – Chloride                | 1.80  |
| SO <sub>4</sub> <sup>2-</sup> – Sulfate   | 2.22  |
| Si – Silicon                              | 1.04  |
| COD - Chemical Oxygen Demand Si – Silicon | 0.936 |

# Life Cycle Impact Assessment

Based on the Life Cycle Inventory, the environmental impacts of Move are assessed with the following impact categories:

## Impact categories (selected by BIFMA Product Category Rules)

- **Global warming** [kg CO<sub>2</sub>-eq.]  
Is due to emissions of greenhouse gases, causing the rise of the global temperature.
- **Acidification** [kg SO<sub>2</sub>-eq.]  
Measures the emissions which increase the acidity of the environment due to various chemical reactions and/or biological activity, or by natural circumstances.
- **Photochemical ozone creation** [kg O<sub>3</sub>-eq.]  
Is created by various chemical reactions, which occur between nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOCs) in sunlight.
- **Ozone Depletion** [kg CFC-11 eq]  
Reduction of the stratospheric ozone layer due to anthropogenic emissions of ozone depleting substances.
- **Eutrophication** [kg N -eq.]  
Is the enrichment of an aquatic ecosystem with nutrients (nitrates, phosphates) that accelerate biological productivity and an undesirable accumulation of algal biomass.
- **Carcinogenics** [CTUh\*]  
Represents the chronic toxicological carcinogenic effects on human health. Provides estimates of the comparative toxicological impact potential associated with a specified mass of a chemical emitted into the environment.  
\*Comparative Toxic Units for human
- **Non-Carcinogenics** [CTUh\*]  
Represents the chronic toxicological non-carcinogenic effects on human health. Provides estimates of the comparative toxicological impact potential associated with a specified mass of a chemical emitted into the environment.  
\*Comparative Toxic Units for human

## Distribution of the environmental impacts for the respective life cycle stages:

The figures in this table are rounded up because the potential uncertainties don't justify the use of more than two significant digits.

| Impact category              | Unit                    | Total   | Materials | Production | Transport | Use                                         | End of life |
|------------------------------|-------------------------|---------|-----------|------------|-----------|---------------------------------------------|-------------|
| Global warming               | kg CO <sub>2</sub> -eq. | 7.4E+01 | 3.0E+01   | 2.1E+01    | 1.7E+01   | No significant environmental impacts occur. | 6.5E+00     |
| Acidification                | kg SO <sub>2</sub> -eq. | 3.1E-01 | 1.3E-01   | 1.0E-01    | 7.3E-02   |                                             | 4.7E-03     |
| Photochemical ozone creation | kg O <sub>3</sub> -eq.  | 4.6E+00 | 1.6E+00   | 9.4E-01    | 1.9E+00   |                                             | 1.0E-01     |
| Ozone depletion              | CFC-11 eq.              | 4.4E-05 | 1.8E-05   | 8.4E-06    | 2.3E-06   |                                             | 1.5E-05     |
| Eutrophication               | kg N -eq.               | 3.1E-01 | 1.3E-01   | 9.7E-02    | 1.5E-02   |                                             | 6.8E-02     |
| Carcinogenics                | CTUh                    | 7.7E-06 | 1.6E-06   | 2.2E-06    | 3.6E-06   |                                             | 2.3E-07     |
| Non-Carcinogenics            | CTUh                    | 1.4E-05 | 8.2E-06   | 4.5E-06    | 3.3E-07   |                                             | 4.8E-07     |

## Product Environmental Profile (PEP)

### For more information

Our Product Environmental Profile (PEP) – an environmental declaration according to the objective of ISO 14021 – can be found on **Steelcase.com**

The PEP provides precise, accurate, verifiable and relevant information on the sustainability aspects of Move, including:

- Life cycle performance
- Materials
- Recycled materials and recyclability
- Certificates
- LEED contribution

# Verification Process and References

The LCA study of Move (reference: 490410) was carried out by Steelcase, according to ISO 14040 / 14044 and based on previous collaboration with the Technical University of Denmark (DTU) and Quantis. It was then critically reviewed by Micheal Hauschild from the Department of Management Engineering of the DTU.

The independent verification of this EPD was carried out by the Department of Management Engineering of the DTU in accordance with ISO 14025.

An environmental declaration according to the objectives of ISO 14025 and BIFMA PCR for Seating: UNCPC 3811.

## References

### Related ISO standards:

- ISO 14025 Environmental labels and declarations – Type III environmental declarations
- ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework
- ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines

### LCIA method and LCI database:

- Product Category Rule for Environmental Product Declarations, BIFMA PCR for Seating: UNCPC 3811, NSF International, Valid through May 31, 2017.
- ILCD HANDBOOK, European Commission, Joint Research Centre, Institute for Environment and Sustainability. ILCD Handbook: General Guide for Life Cycle Assessment – Detailed Guidance. European Union, March 2010, 394p.
- IMPACT 2002+ V2.10 method: JOLLIET, O., MARGNI, M., CHARLES, R., HUMBERT, S., PAYET, J., REBITZER, G. et ROSENBAUM, R. (2003). IMPACT 2002+: A New Life Cycle Impact Assessment Methodology. International Journal of Life Cycle Assessment 8(6) p.324-330.
- Eco-Invent v2.2 LCI database: Swiss Centre for Life Cycle Inventories, Duebendorf, CH - [www.ecoinvent.ch](http://www.ecoinvent.ch)

### End-of-life scenario:

- Mainly based on EPA data for the American market  
[http://www.epa.gov/osw/nonhaz/municipal/pubs/msw\\_2010\\_rev\\_factsheet.pdf](http://www.epa.gov/osw/nonhaz/municipal/pubs/msw_2010_rev_factsheet.pdf)

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## Contact

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