



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

## Steelcase Series 1

**Steelcase Series 1** makes high-quality seating attainable for everyone and everywhere. It delivers performance, style and choice, unprecedented in its class of seating. Best in class. A new class. By Steelcase.

The model chosen for analysis is the most representative line (reference # 435A00) from the Steelcase Series 1 range. Standard features on this model include:

- Integrated LiveBack Technology
- Adjustable Lumbar
- Adjustable Arm options
- Adjustable Seat Depth

This EPD – Environmental Product Declaration – is valid for the above reference.  
Date of critical review: 10/2018

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Steelcase

# EPD Overview

## Final Assembly Location

Final assembly of Steelcase Series 1 is in Sarrebourg, France by Steelcase for the Europe, Middle East, and Africa markets.

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## Goal and Scope

The potential environmental impacts of Steelcase Series 1 (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 10/2018.

## 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 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 Steelcase Series 1 (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 10/2018.

## **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**

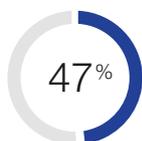
End-of-life product recyclability and local waste management infrastructure are considered. Benefits from recycling are not considered in this phase to avoid double counting.

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 provision of comfortable seating – with the features stated in the product description – for 8 hours a day, 5 days a week over 15 years.

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.

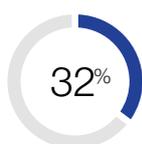
# Life Cycle Inventory

Steelcase Series 1 materials composition is listed below.\*



## PLASTICS

	kg	%
Glass-filled nylon (PA-GF)	5.4	29.2
Polypropylene (PP)	2.7	14.6
Polyoxymethylene (POM)	0.5	2.6
Acrylonitrile butadiene styrene (ABS)	<0.1	0.5
Nylon 66 (PA66)	<0.1	0.1
High density polyethylene (HDPE)	<0.1	<0.1
Nylon 6 (PA6)	<0.1	<0.1
Polyethylene terephthalate (PET)	<0.1	<0.1
Polyester (PET)	<0.1	<0.1
Synthetic rubber	<0.1	<0.1



## METALS

	kg	%
Steel	5.2	28.4
Aluminum (cast)	0.6	3.5



## OTHER MATERIALS

	kg	%
Polyurethane foam	3.8	20.5
Polyester fabric	0.1	0.6



## PACKAGING

	kg	%
Cardboard	3.6	98.3
Low density polyethylene (LDPE)	<0.1	1.7

**TOTAL WEIGHT – incl. packaging 22.0**

\*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 Steelcase Series 1.

### RENEWABLE ENERGY

	MJ
Biomass	68,2
Hydropower	269
Wind	15,4
Geothermal	1,15
Solar	0,221

### NON-RENEWABLE ENERGY

	MJ
Gas	883
Oil	735
Coal	360
Uranium	276

### WATER

	m <sup>3</sup>
Water withdrawal	0,249

## EMISSIONS

This table inventories the most important emissions to air, soil and water throughout the entire life cycle of Steelcase Series 1.

### EMISSIONS TO AIR

	kg
CO <sub>2</sub> – Carbon dioxide (fossil)	118
CO <sub>2</sub> – Carbon dioxide (biogenic)	7,19
CO – Carbon monoxide (fossil)	0,400
CH <sub>4</sub> – Methane (fossil)	0,561
NO <sub>x</sub> – Nitrogen oxides	0,298
Particulates, > 10 µm	0,099
N <sub>2</sub> O – Dinitrogen monoxide	0,030
NH <sub>3</sub> – Ammonia	0,010

### EMISSIONS TO SOIL

	kg
Cl <sup>-</sup> – Chloride	0,009
Oils	0,020
Na – Sodium	0,006
Ca – Calcium	0,004
Fe – Iron	0,006
C – Carbon	0,006
Si – Silicon	0,001
Al – Aluminium	0,001

### EMISSIONS TO WATER

	kg
Cl <sup>-</sup> – Chloride	4,39
SO <sub>4</sub> <sup>2-</sup> – Sulfate	3,37
COD – Chemical Oxygen Demand	1,63
Ca <sup>2+</sup> – Calcium, ion	1,44
Na <sup>+</sup> – Sodium, ion	2,20

# Life Cycle Impact Assessment

Based on the Life Cycle Inventory, the environmental impacts of Steelcase Series 1 are assessed with the following impact categories:

## Impact categories (selected by Steelcase)

- **Global warming** [kg CO<sub>2</sub>-eq.]  
Is due to emissions of greenhouse gases, causing the rise of the global temperature.
- **Respiratory inorganics** [kg PM2.5\*-eq.]  
Are due to small particles or dust that causes respiratory problems for humans with asthma or respiratory diseases.  
\*Particulate matter smaller than 2.5 micrometres in diameter.
- **Carcinogens** [kg C<sub>2</sub>H<sub>3</sub>Cl-eq.]  
Describe substances or agents which may contribute to cancer.
- **Terrestrial ecotoxicity** [kg TEG\* soil]  
Measures the ecotoxicological factor for terrestrial ecosystems.  
\*Triethylene glycol
- **Non-renewable energy** [MJ primary]  
Describes finite resources that will eventually dwindle, becoming too expensive or too environmentally damaging to extract.

## 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.]	1.3E+02	6.8E+01	5.0E+01	1.1E+01	No significant environmental impacts occur.	3.6E+00
Respiratory inorganics	[kg PM2.5-eq.]	1.4E-01	6.6E-02	6.0E-02	1.3E-02		6.5E-04
Carcinogens	[kg C <sub>2</sub> H <sub>3</sub> Cl-eq.]	5.9E+00	4.6E+00	1.3E+00	6.1E-02		1.1E-02
Terrestrial ecotoxicity	[kg TEG soil]	3.7E+03	1.8E+03	1.3E+03	6.0E+02		1.9E+01
Non-renewable energy	[MJ primary]	2.3E+03	1.3E+03	8.6E+02	1.7E+02		7.4E+00

## 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](https://www.steelcase.com)

The PEP provides precise, accurate, verifiable and relevant information on the sustainability aspects of Steelcase Series 1, including:

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

# Verification Process and References

The LCA study of Steelcase Series 1 (reference: 435A00) 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 Michael 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.

Disclaimer: In the absence of a relevant Product Category Rule (PCR), Steelcase developed a set of specific rules, requirements and guidelines to perform life cycle assessments and Type III environmental declarations, according to the objectives of ISO 14025.

## 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:

- 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 v3.5 LCI database: Swiss Centre for Life Cycle Inventories, Duebendorf, CH - [www.ecoinvent.ch](http://www.ecoinvent.ch)

### End-of-life scenario:

- Mainly based on Eurostat data for the European market  
[https://ec.europa.eu/eurostat/statistics-explained/index.php/Waste\\_statistics](https://ec.europa.eu/eurostat/statistics-explained/index.php/Waste_statistics)

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