



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

B-Free Beam

B-Free furniture creates spaces where people easily connect and collaborate. The collision of ideas becomes a natural part of the work day. B-Free Beam encourages a change in postures from sitting to perching or standing, promoting movement and wellbeing to keep workers engaged.

The model chosen for analysis is the most representative line (reference # 1063533005) from the Steelcase B-Free Beam range. Standard features on this model include:

- Beam dimension: 1200 x 720 mm

This EPD – Environmental Product Declaration – is valid for the above reference.

Date of critical review: 10/2019

EPD Overview

Final Assembly Location

Final assembly of B-Free Beam is in Sarrebourg, France by Steelcase for the Europe, Middle East, and Africa markets.

Goal and Scope >

The potential environmental impacts of B-Free Beam (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 10/2019.

Life Cycle Inventory >

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

Life Cycle Impact Assessment >

- environmental impacts

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 B-Free Beam (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 10/2019.

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

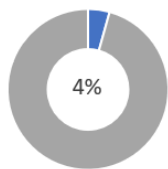
End-of-life product recyclability and local waste management infrastructure are considered. Benefits from recycling are not considered in this phase to avoid double counting.

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.

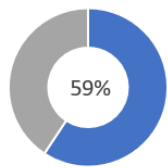
Life Cycle Inventory

Steelcase B-Free Beam materials composition is listed below.*



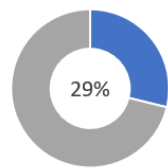
PLASTICS

	kg	%
Polyurethane (PU)	0.8	3.8
Low density polyethylene (LDPE)	<0.1	0.4
Nylon 6 (PA6)	<0.1	<0.1
Nylon 66 (PA66)	<0.1	<0.1
Polypropylene (PP)	<0.1	<0.1



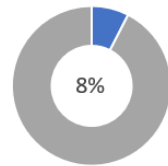
METALS

	kg	%
Steel	8.4	42.0
Aluminum	3.5	17.2



WOOD BASED MATERIAL

	kg	%
Particle Board	4.8	24.2
Medium-density Fiberboard (MDF)	0.9	4.6



OTHER MATERIALS

	kg	%
Polyester fabric	1.5	7.5



PACKAGING

	kg	%
Cardboard	0.9	55.2
Low density polyethylene (LDPE)	0.7	44.7

TOTAL WEIGHT – incl. packaging 21.8

*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 B-Free Beam.

RENEWABLE ENERGY	
	MJ
Hydropower	1380
Biomass	310
Wind	18.6
Geothermal	1.48
Solar	0.632
NON-RENEWABLE ENERGY	
	MJ
Gas	1240
Oil	809
Coal	898
Uranium	295
WATER	
	m ³
Water withdrawal	0.56

EMISSIONS

This table inventories the most important emissions to air, soil and water throughout the entire life cycle of B-Free Beam.

EMISSIONS TO AIR	
	kg
CO ₂ – Carbon dioxide (fossil)	192.493
CO ₂ – Carbon dioxide (biogenic)	16.088
NO _x – Nitrogen oxides	11.735
CO ₂ – Carbon dioxide (land transformation)	4.145
C ₃ H ₈ O – 1-Propanol	0.855
CO – Carbon monoxide (fossil)	0.829
CH ₄ – Methane (fossil)	0.579
SO ₂ – Sulfur dioxide	0.526
EMISSIONS TO SOIL	
	kg
C – Carbon	0.054
Oils	0.033
Fe – Iron	0.028
Ca – Calcium	0.018
Cl – Chloride	0.014
Na – Sodium	0.009
EMISSIONS TO WATER	
	kg
SO ₄ ²⁻ – Sulfate	6.44
Cl – Chloride	5.52
Si – Silicon	3.09
Na ⁺ – Sodium, ion	1.39
Ca ²⁺ – Calcium, ion	1.96
COD - Chemical Oxygen Demand	1.87
TOC - Total Organic Carbon	1.39

Life Cycle Impact Assessment

Based on the Life Cycle Inventory, the environmental impacts of B-Free Beam are assessed with the following impact categories:

Impact categories (selected by Steelcase)

- **Global warming** [kg CO₂-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 C₂H₃Cl-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.

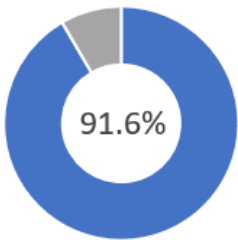
Distribution of the environmental impacts for the respective life cycle stages:

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 ₂ -eq.]	2.1E+02	5.8E+01	1.4E+02	3.6E+00	No significant environmental impacts occur.	3.8E+00
Respiratory inorganics	[kg PM2.5-eq.]	2.2E-01	8.1E-02	1.3E-01	3.7E-03		7.4E-04
Carcinogens	[kg C ₂ H ₃ Cl-eq.]	1.1E+01	5.6E+00	5.4E+00	2.4E-02		1.4E-02
Terrestrial ecotoxicity	[kg TEG soil]	1.4E+04	3.3E+03	1.0E+04	2.7E+02		2.1E+01
Non-renewable energy	[MJ primary]	3.3E+03	9.5E+02	2.2E+03	6.1E+01		7.3E+00

Recycled Materials and Recyclability

B-FREE BEAM		
	kg	%
Total recycled content	21.8	38.8



91.6%

According to the available waste management infrastructures, we estimate that 91.6% is recyclable.

Verification Process and References

The LCA study of B-Free Beam (reference: 1063533005) 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

End-of-life scenario:

- Mainly based on Eurostat data for the European market
https://ec.europa.eu/eurostat/statistics-explained/index.php/Waste_statistics

Contact

For further questions, please contact: epd@steelcase.com

Steelcase®

Visit Steelcase.com

 facebook.com/Steelcase

 twitter.com/Steelcase

 youtube.com/SteelcaseTV

03/2019 © 2014 Steelcase Inc. All rights reserved. All specifications subject to change without notice.
Trademarks used herein are the property of Steelcase Inc. or of their respective owners.