

Steelcase Series® 1

AMERICAS, APAC



About this product

Steelcase Series® 1 gives you essential ergonomics and quality at a great value. This high-performance chair boasts space efficiency, weight-activated controls. It retains everything that's valued in a chair, while making it attainable for everyone.

One chair is required to meet the functional unit of seating for one individual for a 10-year period.

Date of Issue: February 14, 2023
Date of Expiration: February 14, 2028

Learn more

- Explore Steelcase environmental philosophy and commitments [overview](#).
- Find product details and sustainability certifications on [Americas product page](#) and [APAC product page](#) at steelcase.com.
- See our product [warranty](#).
- Contact epd@steelcase.com for any EPD-related questions or inquiries.

About this document

This declaration describes the Life Cycle Assessment of the Series 1 office chair produced for the Americas and APAC markets by Steelcase Inc. in the United States, China, and India. The assessment is performed according to the ISO standards 14040 (2006), 14044 (2006) and 14025 (2006) and BIFMA PCR for Seating: UNCPC 3811 (2020) to generate an EPD for business-to-business and business-to-consumer communication.

ASSESSMENT OVERVIEW

EPD commissioner	Steelcase® Inc
Corporate Address	901 44th Street SE Grand Rapids, Michigan 49508-7594 United States
Product group	Seating
Product name	Series 1
Product intended use	Office chair
Product reference service life	10 years
Reference standards	ISO 14025, ISO 14040, ISO 14044
EPD scope	Cradle to grave
EPD number	EPD#10809
Date of issuance	February 14, 2023
Date of expiration	February 14, 2028
EPD type	Product specific
EPD Product Coverage	Series 1 task chair/stool for the Americas and APAC markets, including the following codes: 435B00, 435A00
Intended audience	Business to business and business to consumer
Year of reported manufacturer data	2021
Functional unit	One unit of seating to seat one individual for a reference service life of 10 years
Applicable markets/regions	Americas, APAC
LCA software and database version	GaBi 10.6.2.9; GaBi database, 2022.2
LCIA methodology and version number	TRACI 2.1 and CML 2001-October 2012
Program administrator	NSF Certification LLC 789 N. Dixboro, Ann Arbor, MI 48105 www.nsf.org
Reference PCR and version number	BIFMA PCR for Seating: UNCPC 3811 (BIFMA PCR, 2020)
PCR reviewer	Review Panel Chaired by Dr. Thomas Gloria
EPD reviewer	External review conducted by: Tony Favilla, afavilla@nsf.org  This declaration and its Life Cycle Assessment was independently verified in accordance with ISO standards 14040 (2006), 14044 (2006) and 14025 (2006), and BIFMA PCR for Seating UNCPC 3811 (2020).
LCA reviewer	External review conducted by: Jack Geibig, jgeibig@ecoform.com  The product Life Cycle Assessment was conducted in accordance with ISO 14044 and the reference PCR.
Disclaimer	The PCR this EPD was based on was written to determine the potential environmental impacts of a seating product from cradle to grave. It 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, and the specifics of the product modeled.

ASSESSMENT PARAMETERS

Functional unit

One unit of seating to seat one individual for a reference service life of 10 years. One product required to fulfill the functional unit.

Product scope

One Series 1 chair, produced in the Americas (product number 435A00), with 4D, height-adjustable arms and a plastic base was modeled for this EPD. This office chair is determined to be a typical product based on sales of the variations. The results presented for this configuration represent a baseline for the product. This may be compared against the results for alternative configurations herein that represent the highest and lowest impacts for this product produced and sold in the Americas and APAC.

Results for alternative configurations of Series 1 with the lowest and highest impacts are also presented in this EPD. Details on the composition and results for the configurations with lowest and highest impacts can be found at the end of this EPD.



<u>Manufacturing location</u>	<u>Product SKUs within the variation allowance</u>	<u>Applicable markets and regions</u>
Kentwood, Michigan	435A00, 435B00	Americas
Dongguan, China Pune, India	435A00, 435B00	APAC




Assessment goal and scope

The potential environmental impacts of Series 1 and its packaging throughout its entire life cycle – including raw materials extraction, production, transport, use, and end of life – were assessed. In the absence of primary information, the GaBi database was used for secondary data.

The life cycle stages included in this assessment follow the BIFMA PCR for Seating: UNCPC 3811 V3. Material acquisition and pre-processing (including transportation), production, distribution, use and end-of-life are assessed for the seating product.

Assessment boundary

The Life Cycle Assessment considers the full life cycle of the product as described here, cradle to grave. Life cycle stages included in this assessment follow the BIFMA PCR for Seating: UNCPC 3811 2020. Life cycle stages and phases are presented according to the PCR for seating.

	Stage	Status
 <p>Cradle to inbound gate MATERIALS ACQUISITION Raw material extraction, pre-processing and transportation of materials to suppliers.</p>	A1. Raw material supply	✓
	A2. Transport	✓
 <p>Gate to gate PRODUCTION PROCESS Transportation of furniture components and materials from Tier 1 suppliers to Steelcase final manufacturing facility. External and internal production.</p>	A3. Manufacturing	✓
	A4. Transport	✓
 <p>Gate to grave DISTRIBUTION, USE AND END OF LIFE Distribution of products, installation, use and end of life.</p>	A5. Installation	✓
	B1. Use	✓
	B2. Maintenance/cleaning	✓
	B3. Repair	✓
	B4. Replacement	✓
	B5. Refurbishment	✓
	B6. Operational energy use	✓
	B7. Operational water use	✓
	C1. Disassembly	✓
	C2. Transport	✓
	C3. Waste processing	✓
C4. Disposal	✓	
Beyond the boundary	D. Reuse/recovery	✓

TYPICAL CONFIGURATION RESULTS

The product composition, packaging composition, recycled content, and recyclability visuals below relate specifically to the typical configuration of Series 1 consisting of 4D, height-adjustable arms, and plastic base produced in the Americas. Product numbers represented by these results include: 435A00.

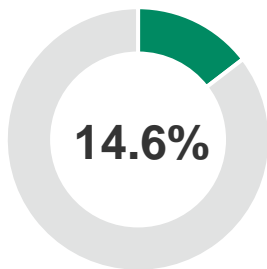
Product composition

Material	Weight (kg)	Weight (%)	Resource Type
Nylon (PA6 and PA66)	5.957	42.51%	Recycled, virgin non-renewable
Steel	4.171	29.80%	Recycled, virgin non-renewable
Polypropylene (PP)	2.216	15.80%	Virgin non-renewable
Aluminum	0.625	4.50%	Recycled, virgin non-renewable
Polyurethane (PU)	0.563	4.00%	Virgin non-renewable
Polyoxymethylene (POM)	0.261	1.90%	Virgin non-renewable
Other	0.219	1.60%	Virgin non-renewable
Total	14.012	100%	

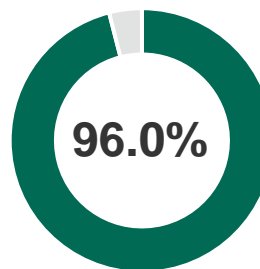
Product packaging composition

Material	Weight (kg)	Weight (%)	Resource Type
Cardboard	5.192	99.06%	Renewable
Paper	0.049	0.93%	Renewable
High-density polyethylene (HDPE)	0.000	0.01%	Non-renewable
Total	5.241	100%	

Product recycled content* and recyclability** summary



TOTAL RECYCLED CONTENT*



RECYCLABILITY BY WEIGHT**

*Total recycled content based on supplier's data. The source of recycled content of various materials could be either post-industrial or post-consumer based on market availability.

**Recyclability: this recyclability rate is the maximum amount of the product that is recyclable, based on the availability of recycling facilities in the specified regions and the ability of the product to be disassembled. Note that, per the requirements of the PCR, the end-of-life results presented in this EPD were calculated using the US EPA's recycling rates within the 2020 Municipal Solid Waste Report for parts that can be disassembled.

Results for the typical configuration of one Series 1 chair, produced in the Americas, consisting of 4D, height-adjustable arms and a plastic base are shown below.

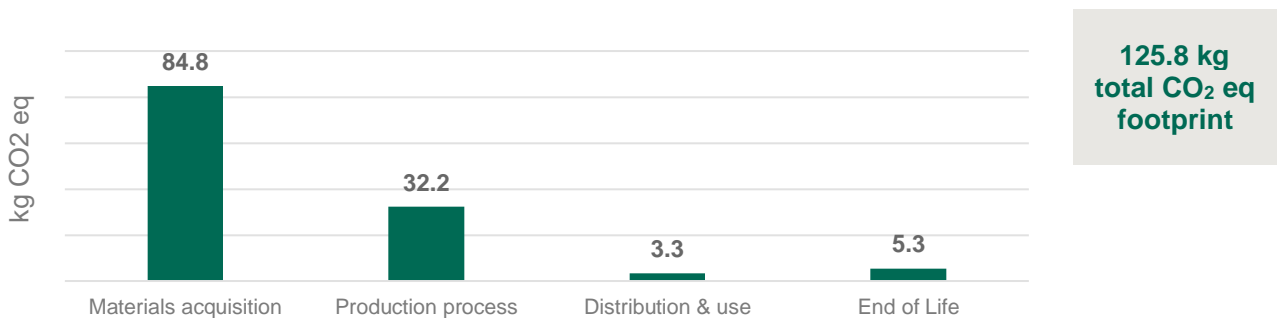
Life cycle impact by category and stage

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 one seat maintained for one individual 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.

	Unit	Life cycle stages				Totals
		Materials acquisition	Production process	Distribution & Use	End of life	
*Global warming potential (100 years) Warming of the atmosphere caused by the global release of greenhouse gases.	kg CO2 eq	8.48E+01	3.22E+01	3.34E+00	5.34E+00	1.26E+02
*Acidification Emissions that increase the acidity of the environment due to various chemical reactions and/or biological activity, or by natural circumstances.	kg SO2 eq	2.18E-01	1.17E-01	1.55E-02	6.76E-03	3.56E-01
*Photochemical ozone creation (Smog) Through various chemical reactions, which occur between nitrogen oxides (NOx) and volatile organic compounds (VOCs) in sunlight.	kg O3 eq	4.42E+00	1.60E+00	3.59E-01	6.06E-02	6.44E+00
*Eutrophication Enrichment of an aquatic ecosystem with nutrients (nitrates, phosphates) that accelerate biological productivity and an undesirable accumulation of algal biomass.	kg N eq	6.13E+00	2.43E+00	2.64E-01	2.04E-01	9.03E+00
*Ozone depletion Reduction of the stratospheric ozone layer due to anthropogenic emissions of ozone depleting substances.	kg CFC-11 eq	4.72E-10	6.97E-11	6.31E-15	2.15E-14	5.42E-10
Primary energy demand Energy consumption at the source.	MJ	1.57E+03	8.01E+02	4.88E+01	1.16E+01	2.43E+03
Net freshwater usage Freshwater used and otherwise not recoverable.	kg	3.61E+02	1.89E+02	6.57E+00	9.64E+00	5.67E+02

*Methods: TRACI 2.1

Global warming potential summary



LOWEST IMPACT CONFIGURATION RESULTS

Results for the alternative configuration of one Series 1 chair with the lowest impacts, which is produced in APAC, consisting of 4D, height-adjustable arms, primarily metal base, headrest, adjustable lumbar support, and hard casters are shown below. This configuration was determined to be a minimum impact configuration for the AMER/APAC regions for its low mass and impact of materials used. The minimum impact configuration is manufactured in two locations in APAC and the composition shown is a weighted average by production volume at the two locations.

Compared to the typical configuration, this product has more accessories but a similar total mass and uses aluminum for the base instead of plastic. Product numbers represented by these results include: 435A00.

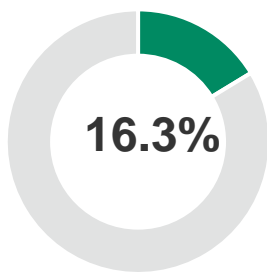
Product composition

Material	Weight (kg)	Weight (%)	Resource Type
Steel	3.837	25.80%	Recycled, virgin non-renewable
Aluminum	2.686	18.10%	Recycled, virgin non-renewable
Polyoxymethylene (POM)	2.664	17.90%	Virgin non-renewable
Polypropylene (PP)	2.232	15.00%	Virgin non-renewable
Nylon (PA6 and PA66)	2.092	14.10%	Recycled, virgin non-renewable
Polyurethane (PU)	1.103	7.40%	Virgin non-renewable
Other	0.253	1.70%	
Total	14.866	100%	

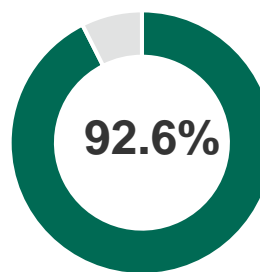
Product packaging composition

Material	Weight (kg)	Weight (%)	Resource Type
Cardboard	3.000	83.26%	Renewable
Polyethylene (PE)	0.558	15.49%	Non-renewable
Paper	0.045	1.25%	Renewable
Total	3.603	100%	

Product recycled content* and recyclability** summary



TOTAL RECYCLED CONTENT*



RECYCLABILITY BY WEIGHT**

*Total recycled content based on supplier's data. The source of recycled content of various materials could be either post-industrial or post-consumer based on market availability.

**Recyclability: this recyclability rate is the maximum amount of the product that is recyclable, based on the availability of recycling facilities in the specified regions and the ability of the product to be disassembled. Note that, per the requirements of the PCR, the end-of-life results presented in this EPD were calculated using the US EPA's recycling rates within the 2020 Municipal Solid Waste Report for parts that can be disassembled.

Life cycle impact by category and stage

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 one seat maintained for one individual 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.

	Unit	Life cycle stages				Totals
		Materials acquisition	Production process	Distribution & Use	End of life	
*Global warming potential (100 years) Warming of the atmosphere caused by the global release of greenhouse gases.	kg CO2 eq	6.97E+01	1.82E+01	9.30E-01	4.78E+00	9.36E+01
*Acidification Emissions that increase the acidity of the environment due to various chemical reactions and/or biological activity, or by natural circumstances.	kg SO2 eq	1.81E-01	1.07E-01	1.31E-02	6.00E-03	3.07E-01
*Photochemical ozone creation (Smog) Through various chemical reactions, which occur between nitrogen oxides (NOx) and volatile organic compounds (VOCs) in sunlight.	kg O3 eq	2.79E+00	1.74E+00	2.82E-01	6.74E-02	4.88E+00
*Eutrophication Enrichment of an aquatic ecosystem with nutrients (nitrates, phosphates) that accelerate biological productivity and an undesirable accumulation of algal biomass.	kg N eq	4.43E+00	1.99E+00	9.43E-02	2.66E-01	6.78E+00
*Ozone depletion Reduction of the stratospheric ozone layer due to anthropogenic emissions of ozone depleting substances.	kg CFC-11 eq	4.56E-10	5.51E-10	1.77E-15	2.85E-14	1.01E-09
Primary energy demand Energy consumption at the source.	MJ	1.39E+03	4.45E+02	1.26E+01	1.29E+01	1.86E+03
Net freshwater usage Freshwater used and otherwise not recoverable.	kg	4.38E+02	8.05E+01	1.94E-01	1.01E+01	5.29E+02

*Methods: TRACI 2.1

Global warming potential summary



HIGHEST IMPACT CONFIGURATION RESULTS

Results for the alternative configuration of one Series 1 stool with the highest impacts, which is produced in the Americas, consisting of a headrest, hard casters, 4D armrests and primarily metal base, are shown below. This configuration was determined to be a maximum impact configuration for the AMER/APAC regions because it has the most accessories, highest mass, and highest impact materials of all Series 1 chair and stool configurations.

Compared with the typical configuration, this product weighs more with additional accessories (headrest, hard casters, armrests) and uses primarily metal for the base instead of plastic. Product numbers represented by these results include: 435B00.

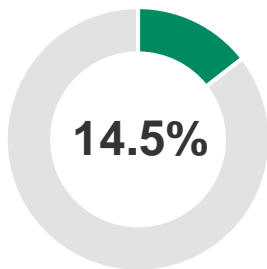
Product composition

Material	Weight (kg)	Weight (%)	Resource Type
Nylon (PA6 and PA66)	6.580	38.00%	Recycled, virgin non-renewable
Steel	5.191	30.00%	Recycled, virgin non-renewable
Polypropylene (PP)	2.239	12.90%	Virgin non-renewable
Aluminum	1.409	8.10%	Recycled, virgin non-renewable
Polyurethane (PU)	1.239	7.20%	Virgin non-renewable
Polyoxymethylene (POM)	0.255	1.50%	Virgin non-renewable
Other	0.385	2.20%	Virgin non-renewable
Total	17.297	100%	

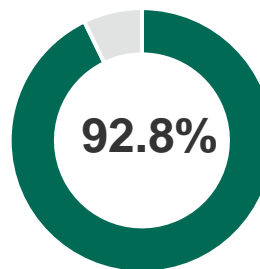
Product packaging composition

Material	Weight (kg)	Weight (%)	Resource Type
Cardboard	5.192	99.06%	Renewable
Paper	0.049	0.93%	Renewable
High-density polyethylene (HDPE)	0.000	0.01%	Non-renewable
Total	5.241	100%	

Product recycled content* and recyclability** summary



TOTAL RECYCLED CONTENT*



RECYCLABILITY BY WEIGHT**

* Total recycled content based on supplier's data. The source of recycled content of various materials could be either post-industrial or post-consumer based on market availability.

** Recyclability: this recyclability rate is the maximum amount of the product that is recyclable, based on the availability of recycling facilities in the specified regions and the ability of the product to be disassembled. Note that, per the requirements of the PCR, the end-of-life results presented in this EPD were calculated using the US EPA's recycling rates within the 2020 Municipal Solid Waste Report for parts that can be disassembled.

Life cycle impact by category and stage

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 one seat maintained for one individual 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.

	Unit	Life cycle stages				Totals
		Materials acquisition	Production process	Distribution & Use	End of life	
*Global warming potential (100 years) Warming of the atmosphere caused by the global release of greenhouse gases.	kg CO2 eq	1.01E+02	3.44E+01	3.91E+00	5.93E+00	1.45E+02
*Acidification Emissions that increase the acidity of the environment due to various chemical reactions and/or biological activity, or by natural circumstances.	kg SO2 eq	2.77E-01	1.26E-01	1.81E-02	7.43E-03	4.29E-01
*Photochemical ozone creation (Smog) Through various chemical reactions, which occur between nitrogen oxides (NOx) and volatile organic compounds (VOCs) in sunlight.	kg O3 eq	5.01E+00	1.78E+00	4.20E-01	7.06E-02	7.28E+00
*Eutrophication Enrichment of an aquatic ecosystem with nutrients (nitrates, phosphates) that accelerate biological productivity and an undesirable accumulation of algal biomass.	kg N eq	7.63E+00	2.68E+00	3.09E-01	2.62E-01	1.09E+01
*Ozone depletion Reduction of the stratospheric ozone layer due to anthropogenic emissions of ozone depleting substances.	kg CFC-11 eq	4.65E-10	8.89E-11	7.39E-15	2.64E-14	5.54E-10
Primary energy demand Energy consumption at the source.	MJ	1.88E+03	8.32E+02	5.72E+01	1.41E+01	2.79E+03
Net freshwater usage Freshwater used and otherwise not recoverable.	kg	4.79E+02	2.01E+02	7.69E+00	1.13E+01	6.99E+02

*Methods: TRACI 2.1

Global warming potential summary



REFERENCES

Life Cycle Assessment, LCA Report for Steelcase. WAP Sustainability Consulting. November 2022.

NSF BIFMA Product Category Rule (PCR) for Seating: UNCPC 3811, Version 3. September 2020.

ISO 14025:2006 Environmental Labels and Declarations – Type III Environmental Declarations – Principles and Procedures.

ISO 14040:2006 Environmental Management – Life Cycle Assessment – Principles and Framework, Requirements and Guidelines.

ISO 14044:2006 Environmental Management – Life cycle assessment – Requirements and Guidelines.

ISO 14044: 2006/ Amd 1:2017 Environmental Management – Life cycle assessment – Requirements and Guidelines – Amendment 1.

Product Category Rule for Environmental Product Declarations, BIFMA PCR for Seating: UNCPC 3811 (ext. 2020-111)

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