

# In accordance with EN 15804+A2 and ISO 14040 / ISO 14044





Casper- CS1

# **GENERAL INFORMATION**

### **MANUFACTURER**

Manufacturer	The Senator Group
Address	Altham Business Park
Contact details	marketingteam@thesenatorgroup.com
Website	www.thesenatorgroup.com

# LCA STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
LCA software provider	One Click LCA
Reference standard	EN 15804+A2:2019 and ISO 14025/14040/14044
PCR	EPD Hub Core PCR Version 1.1, 5 Dec 2023
Sector	Manufactured product
Scope of the LCA	Cradle to gate with options, A4-A5, and modules C1-C4, D
LCA verification	Self-verified by The Senator Group

The manufacturer has the sole ownership, liability, and responsibility for the LCA. LCAs within the same product category but from different programs may not be comparable. LCAs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

### **PRODUCT**

Product name	Casper
Additional labels	-
Product reference	CS1
Place of production	United Kingdom
Period for data	01/01/2024 - 31/12/2024
Averaging in LCA	No averaging
Variation in GWP-fossil for A1-A3	-%

## **ENVIRONMENTAL DATA SUMMARY**

Declared unit	1
Declared unit mass	7.135 kg
GWP-fossil, A1-A3 (kgCO2e)	1.39E+01
GWP-total, A1-A3 (kgCO2e)	1.40E+01
GWP-total for A1-A5, C1-C4 & D (kgCO2e)	1.53E+01
Secondary material, inputs (%)	63.4
Secondary material, outputs (%)	99.3
Total energy use, A1-A3 (kWh)	93.7
Net freshwater use, A1-A3 (m3)	0.57

# PRODUCT AND MANUFACTURER

#### **ABOUT THE MANUFACTURER**

The tale begins in 1976, when our Chairman Colin Mustoe began designing and manufacturing office furniture. In the early days he would even build and deliver the products to customers himself. All these years on and although we've grown into one of the largest office furniture manufacturers in the world, we remain an independent, family-owned business. All the things that were important to us in the beginning; our attention to detail, integrity, investment in people and passion for design, are still very much running through the veins of our business today.

#### PRODUCT DESCRIPTION

Casper is a stylish and contemporary café, dining plastic monoshell chair and stool design, for all manner of hospitality environments in both the corporate and leisure markets, as well as being ideal for meeting applications.

Further information can be found at www.thesenatorgroup.com.

#### PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	60.06	UK & Asia
Minerals	-	-
Fossil materials	39.94	UK & Asia
Bio-based materials	-	-

# **MATERIAL CONTENT**

Raw material category	Amount, mass- KG
Steel	4.285
Polypropylene	2.772
EPDM	0.028
Powder Coat	0.050

#### **FUNCTIONAL UNIT AND SERVICE LIFE**

Declared unit	1
Mass per declared unit	7.135 kg

# SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

# PRODUCT LIFE-CYCLE

#### SYSTEM BOUNDARY

This LCA covers the life-cycle modules listed in the following table.

	Produc stage		Ass ly st		Use stage								nd o		•	S) bo	m	
A1	A2	А3	A	A	В	В	В	В	В	В	В	С	С	С	C		D	
	v	.,	4	5 X	1 MND	2 MND	3 MND	4 MND	5 MND	6 MND	7 MND	1	2	3	4		v	
Х	Х	Х	Х	X	WINTE	IVIIVID	WIND	WIND	WIND	WIND	IVIIAD	Х	Х	Х	X		Х	
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction	Transport	Waste processing	Disposal	Reuse	Recoverv	Recyclina

Modules not declared = MND. Modules not relevant = MNR.

## **MANUFACTURING AND PACKAGING (A1-A3)**

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

## TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

An average transportation distance of 400 kms has been used within the model based on the distance from our manufacturing site to a delivery address in central London. The product is manually carried and installed on-site by The Senator Group operatives and assembled by hand using hand-tools. Installation waste is returned to The Senator Group for reuse/recycling.

# PRODUCT USE AND MAINTENANCE (B1-B7)

If the products are properly assembled no repair, replacement or refurbishment processes are expected within its service life. Air, soil, and water impacts during the use phase have not been studied.

## PRODUCT END OF LIFE (C1-C4, D)

We can strip products down to their component parts and recycle, ensuring the NO waste goes to landfill. Every product from The Senator Group is 99-100% recyclable, so we can guarantee recycling or repurposing on all Senator products. We will additionally recycle as much of our competitor products as possible. You will receive a certificate outlining volumes of products recycled and carbon emissions. All waste packaging is sent back to our Sustain division for recycling. Our packaging programme covers both Senator waste packaging and that of our competitors. In fact, we actively encourage our dealers, suppliers, and other contractors to utilise our packaging recycling scheme. Other companies can purchase The Senator Group white bags for a nominal price, fill with packaging waste, and return to Sustain for us to recycle on their behalf.

# MANUFACTURING PROCESS

# We support our clients Sustainability through:

# 1. Life cycle understanding

To understand product lifecycle in more detail, our Life Cycle Assessments (LCAs) are more detailed and incorporate elements of the product lifecycle. LCAs will provide our clients with more insight to support decision making, with publicly comparable data to compare our products against our competitors and support our design teams in better designing out carbon.

#### 2. Servicing

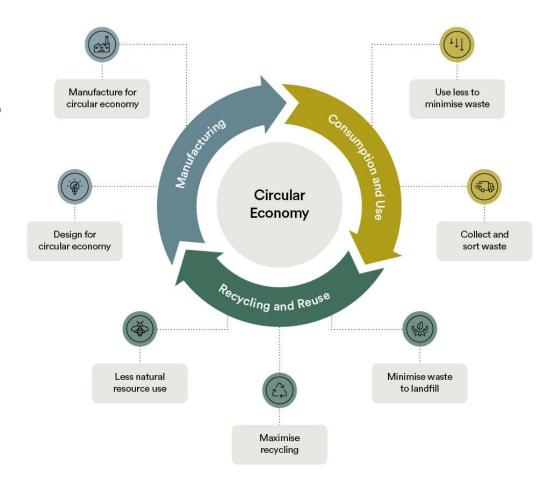
We offer servicing agreements where products are serviced periodically to extend the product lifecycle.

# 3. Leasing

We can agree a leasing service – this will be assessed alongside the client to consider both commerciality and sustainability benefits alongside the other services we offer.

#### 4. End of Life

Sustainability services via Sustain.



# LIFE-CYCLE ASSESSMENT

#### **CUT-OFF CRITERIA**

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

## **ALLOCATION, ESTIMATES AND ASSUMPTIONS**

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging materials	No allocation
Ancillary materials	No allocation
Manufacturing energy and waste	Allocated by mass or volume

#### **AVERAGES AND VARIABILITY**

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	%

This LCA is factory specific.

#### LCA SOFTWARE AND BIBLIOGRAPHY

This LCA has been created using One Click LCA EPD Generator. The LCA has been prepared according to the reference standards and ISO 14040/14044. Ecoinvent v3.8 and One Click LCA databases were used as sources of environmental data.

# **ENVIRONMENTAL IMPACT DATA**

#### CORE ENVIRONMENTAL IMPACT INDICATORS - EN 15804+A2, PEF

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	В5	В6	В7	C1	C2	СЗ	C4	D
GWP – total¹)	kg CO₂e	1.21E+01	1.21E+00	6.79E-01	1.40E+01	3.09E-01	7.49E-03	MND	0.00E+00	3.19E-01	6.48E-01	5.01E-04	0.00E+00						
GWP – fossil	kg CO <sub>2</sub> e	1.21E+01	1.21E+00	6.78E-01	1.39E+01	3.09E-01	7.49E-03	MND	0.00E+00	3.19E-01	6.48E-01	5.00E-04	0.00E+00						
GWP – biogenic	kg CO₂e	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
GWP – LULUC	kg CO₂e	1.27E-02	6.72E-04	1.00E-03	1.43E-02	1.38E-04	3.92E-06	MND	0.00E+00	1.43E-04	3.72E-04	1.38E-07	0.00E+00						
Ozone depletion pot.	kg CFC <sub>-11</sub> e	1.50E-06	1.75E-08	2.95E-08	1.54E-06	4.56E-09	3.99E-11	MND	0.00E+00	4.71E-09	2.56E-09	1.57E-11	0.00E+00						
Acidification potential	mol H†e	5.31E-02	1.80E-02	4.31E-03	7.55E-02	1.05E-03	1.48E-05	MND	0.00E+00	1.09E-03	1.89E-03	5.52E-06	0.00E+00						
EP-freshwater <sup>2)</sup>	kg Pe	4.86E-04	6.90E-05	3.40E-04	8.96E-04	2.40E-05	7.22E-07	MND	0.00E+00	2.48E-05	1.10E-04	8.40E-07	0.00E+00						
EP-marine	kg Ne	1.13E-02	4.32E-03	7.18E-04	1.63E-02	3.46E-04	7.67E-06	MND	0.00E+00	3.57E-04	7.21E-04	1.38E-06	0.00E+00						
EP-terrestrial	mol Ne	1.17E-01	4.79E-02	7.39E-03	1.73E-01	3.76E-03	4.89E-05	MND	0.00E+00	3.89E-03	5.21E-03	1.48E-05	0.00E+00						
POCP ("smog") <sup>3)</sup>	kg NMVOCe	4.78E-02	1.43E-02	2.90E-03	6.49E-02	1.55E-03	1.70E-05	MND	0.00E+00	1.60E-03	1.55E-03	5.41E-06	0.00E+00						
ADP-minerals & metals <sup>4)</sup>	kg Sbe	8.00E-05	2.38E-06	2.97E-05	1.12E-04	8.61E-07	2.55E-08	MND	0.00E+00	8.90E-07	8.53E-06	9.82E-10	0.00E+00						
ADP-fossil resources	MJ	1.78E+02	1.61E+01	1.65E+01	2.10E+02	4.48E+00	4.16E-02	MND	0.00E+00	4.63E+00	2.71E+00	1.16E-02	0.00E+00						
Water use <sup>5)</sup>	m³e depr.	2.23E+01	6.68E-02	6.82E-01	2.31E+01	2.21E-02	9.50E-04	MND	0.00E+00	2.29E-02	9.38E-02	7.04E-05	0.00E+00						

<sup>1)</sup> GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

### ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS - EN 15804+A2, PEF

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	В5	В6	В7	C1	C2	СЗ	C4	D
Particulate matter	Incidence	6.61E-07	7.76E-08	4.43E-08	7.83E-07	3.09E-08	3.14E-10	MND	0.00E+00	3.19E-08	2.75E-08	8.40E-11	0.00E+00						
Ionizing radiation <sup>6)</sup>	kBq U235e	3.92E-01	1.15E-02	5.27E-02	4.56E-01	3.90E-03	1.73E-04	MND	0.00E+00	4.03E-03	2.31E-02	1.55E-05	0.00E+00						
Ecotoxicity (freshwater)	CTUe	2.82E+02	1.82E+00	5.43E+00	2.90E+02	6.34E-01	2.28E-02	MND	0.00E+00	6.55E-01	2.44E+00	7.78E-03	0.00E+00						
Human toxicity, cancer	CTUh	4.26E-08	2.36E-10	4.59E-10	4.33E-08	5.10E-11	2.98E-12	MND	0.00E+00	5.27E-11	3.02E-10	2.16E-13	0.00E+00						
Human tox. non-cancer	CTUh	3.32E-07	7.52E-09	2.31E-08	3.63E-07	2.90E-09	6.25E-11	MND	0.00E+00	3.00E-09	9.63E-09	1.39E-11	0.00E+00						
SQP <sup>7)</sup>	-	1.89E+01	9.31E+00	5.79E+00	3.40E+01	4.51E+00	5.75E-02	MND	0.00E+00	4.66E+00	5.18E+00	2.86E-02	0.00E+00						

<sup>6)</sup> EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

## **USE OF NATURAL RESOURCES**

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	В5	В6	В7	C1	C2	сз	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	2.32E+01	1.86E-01	8.23E+01	1.06E+02	6.14E-02	2.67E-03	MND	0.00E+00	6.34E-02	4.29E-01	2.45E-04	0.00E+00						
Renew. PER as material	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Total use of renew. PER	MJ	2.32E+01	1.86E-01	8.23E+01	1.06E+02	6.14E-02	2.67E-03	MND	0.00E+00	6.34E-02	4.29E-01	2.45E-04	0.00E+00						
Non-re. PER as energy	MJ	1.97E+02	1.61E+01	1.89E+01	2.32E+02	4.48E+00	- 1.44E+00	MND	0.00E+00	4.63E+00	- 1.16E+02	1.16E-02	-3.55E-15						
Non-re. PER as material	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Total use of non-re. PER	MJ	1.97E+02	1.61E+01	1.89E+01	2.32E+02	4.48E+00	- 1.44E+00	MND	0.00E+00	4.63E+00	- 1.16E+02	1.16E-02	-3.55E-15						
Secondary materials	kg	4.52E+00	7.93E-03	1.98E-02	4.55E+00	1.91E-03	1.27E-04	MND	0.00E+00	1.97E-03	1.08E-02	3.87E-06	0.00E+00						
Renew. secondary fuels	MJ	1.09E-03	5.56E-05	1.59E-03	2.74E-03	2.42E-05	1.07E-06	MND	0.00E+00	2.50E-05	1.49E-04	7.00E-08	0.00E+00						
Non-ren. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Use of net fresh water	m³	5.48E-01	1.85E-03	1.74E-02	5.67E-01	6.62E-04	1.62E-05	MND	0.00E+00	6.84E-04	1.78E-03	-1.41E-04	2.02E-15						

<sup>8)</sup> PER = Primary energy resources.

# **END OF LIFE – WASTE**

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	СЗ	C4	D
Hazardous waste	kg	1.82E-02	2.63E-02	1.02E-01	1.47E-01	7.59E-03	4.10E-04	MND	0.00E+00	7.84E-03	4.05E-02	1.96E-05	0.00E+00						
Non-hazardous waste	kg	9.56E-01	4.29E-01	2.50E+00	3.89E+00	1.40E-01	1.22E-02	MND	0.00E+00	1.45E-01	1.24E+00	1.79E-01	0.00E+00						
Radioactive waste	kg	5.86E-04	2.82E-06	6.26E-05	6.52E-04	9.55E-07	4.40E-08	MND	0.00E+00	9.87E-07	5.91E-06	3.80E-09	0.00E+00						

### **END OF LIFE – OUTPUT FLOWS**

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	СЗ	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Materials for recycling	kg	3.22E-04	0.00E+00	1.75E-10	3.22E-04	0.00E+00	3.50E-02	MND	0.00E+00	0.00E+00	7.06E+00	0.00E+00	0.00E+00						
Materials for energy rec	kg	1.67E-01	0.00E+00	0.00E+00	1.67E-01	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	2.80E-02	0.00E+00	0.00E+00						
Exported energy	MJ	1.03E-02	0.00E+00	0.00E+00	1.03E-02	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Exported energy – Electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Exported energy – Heat	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						

# ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	B7	C1	C2	С3	C4	D
Global Warming	kg CO₂e	1.05E+01	1.20E+00	8.44E-01	1.25E+01	3.07E-01	7.47E-03	MND	0.00E+00	3.17E-01	6.46E-	4.96E-	0.00E+0						
Pot.		1.032.01	1.202.00	0.442 01	1.232.01	3.072 01	7.472 03		141140	141111	141111	IVIII	141142	141111	0.002.00	3.172 01	01	04	0
Ozone depletion	kg CFC.	7.72E-07	1.39E-08	9.17E-08	8.77E-07	3.64E-09	3.27E-11	MND	0.00E+00	3.76E-09	2.14E-	1.25E-	0.00E+0						
Pot.	11e	7.72E-07	1.59E-06	9.176-00	6.77E-U7	3.04E-09	3.2/E-11	IVIIVD	IVIIVD	IVIIVD	IVIIND	IVIIVD	IVIIVD	IVIIND	0.002+00	3.70E-09	09	11	0
Acidification	kg SO₂e	4.48E-02	1.45E-02	6.27E-03	6.56E-02	8.04E-04	1.14E-05	MND	MND	MND	MND	NANID	MND	MND	0.00E+00	8.31E-04	1.50E-	4.43E-	0.00E+0
		4.48E-02	1.45E-U2	6.27E-03	6.56E-U2	8.04E-04	1.14E-05	IVIND	IVIND	MIND	IVIND	MND	MIND	IVIND	0.00E+00	8.31E-04	03	06	0
Eutrophication	kg PO <sub>4</sub> ³e	6.65E-03	1.69E-03	2.73E-03	1 115 02	1.005.04	2.015.00	NANID	MND	MND	MND	MND	MND	NANID	0.00E+00	2.02E-04	2.76E-	1.18E-	0.00E+0
		6.65E-03	1.69E-03	2./3E-U3	1.11E-02	1.96E-04	2.81E-06	MND	IVIND	MIND	IVIND	IVIND	MIND	MND	0.00E+00	2.02E-04	04	06	0
POCP ("smog")	kg C₂H₄e	5.39E-03	7.76E-04	4.18E-04	6.58E-03	7.16E-05	1.12E-06	MND	MND	MND	MND	NANID	MND	MND	0.00E+00	7 405 05	1.14E-	2.87E-	0.00E+0
		5.39E-03	7.76E-U4	4.18E-04	6.58E-03	7.16E-U5	1.12E-Ub	IVIND	IVIND	MIND	IVIND	MND	MIND	IVIND	0.00E+00	7.40E-05	04	07	0
ADP-elements	kg Sbe	F 70F 0F	2 225 06	2.055.05	0.005.05	0.405.07	2.545.00	MND	NANID	NANID	NANID	NANID	MND	NANID.	0.005.00	0.005.07	8.48E-	9.53E-	0.00E+0
		5.78E-05	2.33E-06	2.95E-05	8.96E-05	8.40E-07	2.51E-08	IVIND	MND	MND	MND	MND	MIND	MND	0.00E+00	8.68E-07	06	10	0
ADP-fossil	MJ	4.575.02	4 505 . 04	1.565.01	4.005.03	4.425.00	2.075.02	NANID	NANID	NANID	NANID	NANID	NANID	NANID.	0.005.00	4.575.00	2.31E+0	1.14E-	0.00E+0
		1.57E+02	1.59E+01	1.56E+01	1.88E+02	4.42E+00	3.87E-02	MND	0.00E+00	4.57E+00	0	02	0						

### **ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM**

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	СЗ	C4	D
GWP-GHG <sup>9)</sup>	kg CO₂e	1.21E+01	1.21E+00	6.79E-01	1.40E+01	3.09E-01	7.49E-03	MND	0.00E+00	3.19E-01	6.48E-01	5.01E-04	0.00E+00						