



Very Guest Seating



Environmental Product Declaration

EPD-S-P-12460
Date of Issue: May 20, 2024
Date of Expiration: May 19, 2029

Product Category Rule

BIFMA PCR for Seating, UNCPC 3811
EN 15804+A2:2019/AC2021
Construction Products PCR:2019:14 version 1.3.4
In accordance with ISO 14025

Functional Unit

1 Very Guest seat, maintained for a period of 10 years produced in Europe.

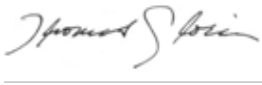
This EPD was not written to support comparative assertions. EPDs based on different PCRs or different calculation models may not be comparable. When attempting to compare EPDs or life cycle impacts of products from different companies, the user should be aware of the uncertainty in the final results due to and not limited to the practitioner's assumptions, the source of the data used in the study and the software tool used to conduct the study.

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com.

Program

Program: The International EPD System
www.environdec.com
Program Operator: EPD International



Program Operator	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com
Manufacturer Name and Address	Haworth, Inc. One Haworth Center Holland, MI 49423 sustainability@haworth.com
Declaration Number	EPD-S-P-12460
Declared Product and Functional Unit	1 Very Guest seat, maintained for a 10-year period produced in Europe
Reference PCR and Version Number	CEN standard EN 15804 serves as the core PCR PCR 2019:14 Construction products, version 1.3.4 BIFMA PCR for Seating: UNCPC 3811, Version 3
Product's intended Application and Use	Commercial Furniture
Product RSL	10 years
Markets of Applicability	Europe
Date of Issue	May 19, 2024
Period of Validity	5 years from date of issue
EPD Type	Product Specific
Intended Audience	Business-to-Business, Business-to-Consumer
Range of Dataset Variability	N/A
EPD Scope	Cradle to Grave
Year of reported manufacturer primary data	2022
LCA Software and Version Number	Sphera LCA FE (GaBi) 10.7
LCI Database and Version Number	Sphera MLC (GaBi) 2023.2
LCIA Methodology and Version Number	EN 15804+A2 (EF 3.1), IPCC AR6 + TRACI 2.1
Core PCR review was conducted by:	The Technical Committee of the International EPD® System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat. www.environdec.com/contact .
The sub-category PCR review was conducted by:	Thomas Gloria, PhD (chair) Jack Geibig, P.E. Michael Overcash, PhD
Independent, third party verification of the declaration and data, according to ISO 14040 (2006), ISO 14025 (2006), 14025 (2006), EN 15804+A2, and BIFMA PCR for Seating: UNCPC 3811 V3, which serves as the core PCR. <input checked="" type="checkbox"/> EPD verification by individual verifier	Thomas Gloria, Industrial Ecology Consultants  Approved by: The International EPD® System
This life cycle assessment was conducted in accordance with ISO 14044, EN 15804+A2, and the reference PCR by:	WAP Sustainability Consulting
Procedure for follow-up of data during EPD validity involves third-party verifier	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
The EPD owner has the sole ownership, liability, and responsibility for the EPD.	
EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.	
This study utilizes the BIFMA Seating PCR as a cPCR. This BIFMA PCR was used to meet market expectations such as Building Transparency EC3 comparisons, LEED and existing vendor procurement requirements, and product scoring programs. The EPD should not be used outside of this context.	

Company Description

Haworth strives to be a sustainable corporation. We believe operating a sustainable corporation will allow us to help people do great things for generations to come. We are on a journey—one that promotes longevity and delivers value to the people, communities, and planet that we serve. At our core, we are a family—and we weather challenges together. Haworth is built upon a culture that empowers members and all stakeholders to make positive changes. We strengthen existing partnerships and build new ones, while empowering our members and leveraging our global reach, as we continue our drive toward making positive changes for the people and communities, we serve all over the world.

Product Description

The Very Guest chair's top characteristics include its universal appeal, wide range of applications, high level of recyclability & fantastic scope of colour. With models and options to support a variety of task and collaborative needs, Very works to bring consistency throughout an organization. Featuring chairs perfect for corner offices, conferencing, cafeterias, medical centres, classrooms—and all points in between—Very can operate in a wide range of environments. Very Guest is manufactured in Queluz, Portugal— an ISO 14001 certified manufacturing facility. This product can be easily disassembled at the end of its useful life. Components are identified with ISO recycling symbols and material information to assist in the recycling effort, where practical. Haworth offers circular service solutions for product take back, refurbishment, or recycling after the product's useful life.

Results were calculated for multiple configurations of the seating product. The first chair configuration reviewed (6241) is a seminar chair consisting of a steel sled base, a plastic back without upholstery, and armrests. This configuration was determined to have the lowest potential impacts of all Very Guest configurations produced in Europe. This may be compared against the results for an alternative configuration herein that represents the highest impacts for this product produced and sold in Europe. The second configuration reviewed (6213) is a visitor and seminar chair consisting of a five-star base, an upholstered back, adjustable height, and armrests. This configuration was determined to have the highest potential impacts of all Very Guest configurations produced in Europe. Product codes within the variation allowance include those beginning with 621, 622, 623, 624, and 625.

This product falls under UN CPC 3811.

The compositions of the chairs reviewed are provided below. Material compositions are reported per unit of product. The lowest-impact configuration (6241) has a total product weight of 5.29 kg and total packaging weight of 0.14 kg.

Material	[kg]	[%]	Recycled Content [%]	Resource Type
Product				
Steel	4.96	94%	56%	Recycled, Virgin Non-renewable
Nylon PA6	0.17	3%	0%	Virgin Non-renewable
Polypropylene	0.15	3%	0%	Virgin Non-renewable
Other	0.01	<1%	0%	Virgin Non-renewable
Packaging				
Polyethylene	0.14	100%	0%	Virgin Non-renewable

The highest-impact configuration (6213) has a total product weight of 13.6 kg and total packaging weight of 0.80 kg.

Material	[kg]	[%]	Recycled Content [%]	Resource Type
Product				
Aluminum	5.80	43%	53%	Recycled, Virgin Non-renewable
Steel	2.77	20%	35%	Recycled, Virgin Non-renewable
Polypropylene	2.16	16%	2%	Recycled, Virgin Non-renewable
Fiberboard	0.67	5%	0%	Virgin Non-renewable

Polyoxymethylene	0.63	5%	0%	Virgin Non-renewable
Nylon PA6	0.56	4%	0%	Virgin Non-renewable
Polyurethane	0.48	4%	0%	Virgin Non-renewable
Other	0.51	3%	17%	Recycled, Virgin Non-renewable
Packaging				
Cardboard	0.62	78%	47%*	Recycled, Virgin Renewable
Polyethylene	0.14	18%	0%	Virgin Non-renewable
Paper	0.04	4%	0%*	Virgin Renewable

*Recycled content of paper and cardboard packaging are average values associated with background LCI datasets

Additional Environmental Information

The product under review is manufactured at a zero waste-to-landfill facility that is ISO 14001- and ISO 9001- certified. In addition, this product has the following certifications:

- [Red dot award](#)
- [Fire Retardancy: Class 1 IM](#)
- [European Level 3 Certified](#)
- [GS Safety Award](#)
- [GREENGUARD Gold Certified](#)

Functional Unit

The functional unit according to the PCR is one unit of seating to seat one individual, maintained for a 10-year period produced in Europe. The product under study has a 10-year service life under ANSI/BIFMA X5.5 and therefore does not require replacements to meet the functional unit.

LCA Stages



Materials Acquisition & Pre-Processing | Includes raw material extraction, pre-processing of materials, and transport to production.

Production | Includes component and final assembly manufacturing operations, both by Haworth and upstream suppliers, as well as intermediate transport and packaging requirements.

Distribution, Storage, and Use | Includes an average distribution to customers. No additional storage is required. There are no impacts associated with use of the product.

End-of-Life | Includes transport to and disposal of product and packaging based on average European EOL rates.

LCA Information

General principles of allocation were based on ISO 14040/44. Where possible, allocation was avoided. At the part supplier production facilities, manufacturing inputs and outputs are allocated to co-products by mass because of the use of secondary

datasets and no primary data available for part suppliers. At Haworth assembly facilities, manufacturing inputs and outputs are allocated to co-products based on economic value. This choice was deemed the most appropriate at Haworth facilities due to the availability of data on economic value. As a default, Sphera Managed LCA Content datasets use a physical mass basis for allocation.

Throughout the study recycled materials were accounted for via the cut-off method. Under this method, impacts and benefits associated with the previous life of a raw material from recycled stock are excluded from the system boundary and includes the impacts associated with reprocessing and preparation of recycled materials. Additionally, impacts and benefits associated with secondary functions of materials at end of life are also excluded.

Production of capital goods, infrastructure, and personnel-related activities are excluded, as required by the BIFMA PCR for seating.

LCA Results – Lowest-Impact Configuration

All results are given per functional unit, which is one unit of seating to seat one individual, maintained for a 10-year period. Results are reported separately by life cycle stage per the BIFMA PCR for seating. It is discouraged to use of results for Material Acquisition and Production without considering the results for End of Life.

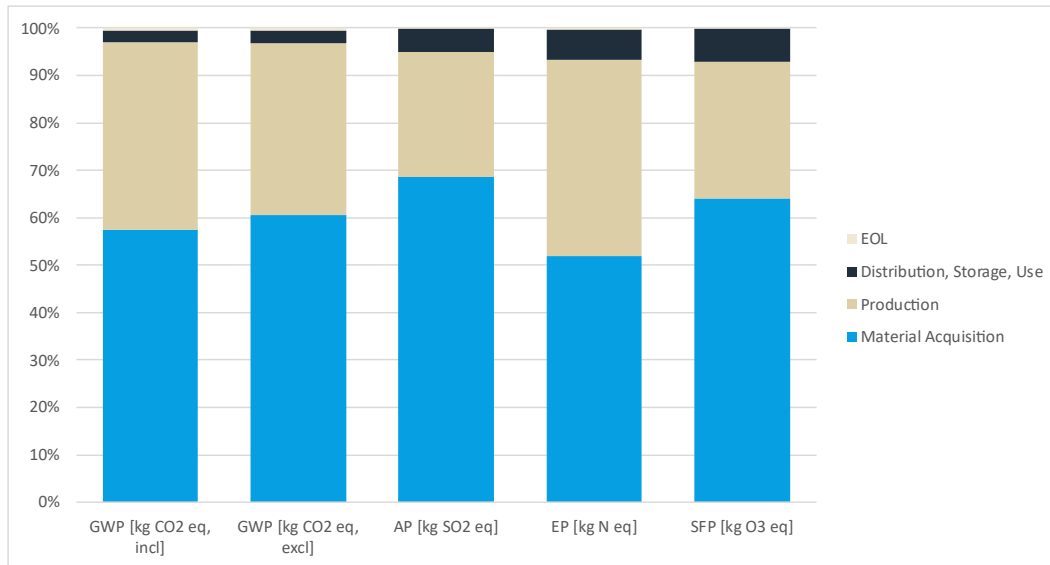
Impact Category	Material Acquisition	Production w/ grid electricity*	Production w/ purchased renewables*	Distribution, Storage, Use	EOL	Total**
<i>IPCC AR6 LCIA Impacts</i>						
Global Warming Potential, incl biogenic [kg CO ₂ eq]	1.53E+01	1.05E+01	8.04E+00	6.43E-01	1.44E-01	2.66E+01
Global Warming Potential, excl biogenic [kg CO ₂ eq]	1.53E+01	9.16E+00	6.65E+00	6.43E-01	1.44E-01	2.53E+01
<i>TRACI 2.1 LCIA Impacts</i>						
Acidification Potential [kg SO ₂ eq]	4.19E-02	1.62E-02	1.21E-02	2.96E-03	8.73E-05	6.11E-02
Eutrophication Potential [kg N eq]	2.08E-03	1.65E-03	1.20E-03	2.62E-04	9.31E-06	4.00E-03
Ozone Depletion Potential [kg CFC 11 eq]	1.31E-13	2.13E-12	6.50E-12	1.66E-15	7.42E-16	2.26E-12
Smog Formation Potential [kg O ₃ eq]	6.36E-01	2.88E-01	2.04E-01	6.85E-02	1.40E-03	9.94E-01
<i>Resource Use Indicators</i>						
Renewable primary resources used as energy carrier [MJ]	2.09E+01	8.02E+01	1.35E+02	3.60E-01	2.85E-02	1.01E+02
Renewable primary resources with energy content used as material [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable primary resources, total [MJ]	2.09E+01	8.02E+01	1.35E+02	3.60E-01	2.85E-02	1.01E+02
Non-renewable primary resources used as energy carrier [MJ]	1.83E+02	1.65E+02	1.23E+02	9.03E+00	3.34E-01	3.56E+02
Non-renewable primary resources with energy content used as a material [MJ]	1.96E+01	3.22E+00	3.22E+00	0.00E+00	0.00E+00	2.28E+01
Non-renewable primary resources, total [MJ]	2.02E+02	1.68E+02	1.26E+02	9.03E+00	3.34E-01	3.79E+02
Recovered energy [MJ]	0.00E+00	5.61E+00	5.61E+00	0.00E+00	6.32E-01	6.25E+00
Net fresh water usage [kg]***	-3.45E-02	9.23E-02	1.17E-01	1.23E-03	3.09E-04	5.94E-02

*Impacts in the “production w/ grid electricity” stage includes electricity from the grid and on-site renewables whereas “production w/ purchased renewables” also includes electricity from the grid (if any), on-site renewables (if any), and voluntary renewable electricity purchased by Haworth for production purposes.

**Includes material acquisition, production w/ grid, distribution, storage, use, and EOL.

***Water usage from electricity generation is included

The chart below presents the relative contribution of each life cycle stage to the TRACI 2.1 and IPCC environmental impact categories by life cycle stage per the BIFMA PCR for seating.



Additionally, results have been calculated using LCIA methodologies for core environmental impact categories specified in EN 15804+A2, as well as LCI indicators required by EN15804+A2. Results are reported per functional unit. For this product, 1 unit of product is required to meet the functional unit. The results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks. It is discouraged to use of results for A1-A3 without considering the results for C1-C4.

	Product Stage w/ grid electricity*	Product Stage w/ purchased renewables*	Construction Stage		Use Stage							End of Life		Benefits and Loads Beyond the System Boundary		
	A1-A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG [kg CO2 eq.]	2.45E+01	2.20E+01	6.43E-01	3.97E-02	0	0	0	0	0	0	0	0	1.36E-02	8.61E-02	4.50E-03	-5.53E+00
Climate Change - total [kg CO2 eq.]	2.59E+01	2.34E+01	6.44E-01	3.97E-02	0	0	0	0	0	0	0	0	1.36E-02	8.61E-02	4.43E-03	-5.16E+00
Climate Change, fossil [kg CO2 eq.]	2.44E+01	2.19E+01	6.42E-01	3.97E-02	0	0	0	0	0	0	0	0	1.36E-02	8.61E-02	4.48E-03	-5.52E+00
Climate Change, biogenic [kg CO2 eq.]	1.43E+00	1.43E+00	4.13E-04	-1.03E-05	0	0	0	0	0	0	0	0	8.79E-06	2.95E-06	-5.57E-05	3.63E-01
Climate Change, land use and land use change [kg CO2 eq.]	7.55E-03	7.30E-03	7.29E-04	1.84E-06	0	0	0	0	0	0	0	0	1.55E-05	1.43E-06	4.18E-06	-9.70E-04
Ozone depletion [kg CFC-11 eq.]	1.05E-10	3.20E-10	7.86E-14	9.19E-15	0	0	0	0	0	0	0	0	1.67E-15	1.69E-14	7.49E-15	9.34E-13
Acidification [Mole of H+ eq.]	6.30E-02	5.88E-02	3.17E-03	8.76E-06	0	0	0	0	0	0	0	0	4.10E-05	1.07E-05	1.40E-05	-1.27E-02
Eutrophication, freshwater [kg P eq.]	4.22E-05	3.84E-05	3.15E-06	1.89E-07	0	0	0	0	0	0	0	0	6.70E-08	4.52E-09	4.18E-07	-5.85E-06
Eutrophication, marine [kg N eq.]	1.52E-02	1.38E-02	1.60E-03	2.49E-06	0	0	0	0	0	0	0	0	2.02E-05	2.91E-06	3.38E-06	-2.45E-03
Eutrophication, terrestrial [Mole of N eq.]	1.62E-01	1.47E-01	1.76E-02	3.51E-05	0	0	0	0	0	0	0	0	2.23E-04	4.92E-05	3.71E-05	-2.23E-02
Photochemical ozone formation, human health [kg NMVOC eq.]	4.81E-02	4.41E-02	3.25E-03	6.89E-06	0	0	0	0	0	0	0	0	3.99E-05	8.36E-06	1.06E-05	-9.01E-03
Resource use, mineral and metals [kg Sb eq.]**	8.44E-05	8.51E-05	4.21E-08	1.16E-10	0	0	0	0	0	0	0	0	8.95E-10	1.50E-10	1.21E-10	-2.38E-05
Resource use, fossils [MJ]**	3.92E+02	3.50E+02	8.41E+00	3.63E-02	0	0	0	0	0	0	0	0	1.79E-01	3.85E-02	6.71E-02	-7.56E+01
Water use [m³ world equiv.]**	1.13E+00	2.33E+00	3.74E-02	3.65E-03	0	0	0	0	0	0	0	0	7.95E-04	8.18E-03	-6.02E-05	-3.54E-01
Use of renewable primary energy (PERE) [MJ]	1.01E+02	1.56E+02	3.60E-01	5.62E-03	0	0	0	0	0	0	0	0	7.65E-03	9.23E-03	6.05E-03	-7.58E+00

	Product Stage w/ grid electricity*	Product Stage w/ purchased renewables*	Construction Stage				Use Stage							End of Life		Benefits and Loads Beyond the System Boundary	
	A1-A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Primary energy resources used as raw materials (PERM) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total use of renewable primary energy resources (PERT) [MJ]	1.01E+02	1.56E+02	3.60E-01	5.62E-03	0	0	0	0	0	0	0	0	7.65E-03	9.23E-03	6.05E-03	-7.58E+00	
Use of non-renewable primary energy (PENRE) [MJ]	3.70E+02	3.29E+02	9.03E+00	3.66E-02	0	0	0	0	0	0	0	0	1.92E-01	3.85E-02	6.71E-02	-7.56E+01	
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	2.28E+01	2.28E+01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total use of non-renewable primary energy resources (PENRT) [MJ]	3.93E+02	3.51E+02	9.03E+00	3.66E-02	0	0	0	0	0	0	0	0	1.92E-01	3.85E-02	6.71E-02	-7.56E+01	
Input of secondary material (SM) [kg]	5.93E+00	5.93E+00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Use of non renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Use of net fresh water (FW) [m3]	5.78E-02	8.25E-02	1.23E-03	8.77E-05	0	0	0	0	0	0	0	0	2.62E-05	1.95E-04	7.61E-07	-4.28E-01	
Hazardous waste disposed (HWD) [kg]	1.16E-07	1.19E-07	2.60E-11	1.36E-12	0	0	0	0	0	0	0	0	5.52E-13	3.06E-13	5.58E-12	-3.62E-07	
Non-hazardous waste disposed (NHWD) [kg]	2.15E+00	2.16E+00	7.86E-04	1.74E-02	0	0	0	0	0	0	0	0	1.67E-05	7.83E-03	8.19E-02	5.20E-01	
Radioactive waste disposed (RWD) [kg]	1.60E-02	1.37E-02	2.59E-05	7.99E-07	0	0	0	0	0	0	0	0	5.51E-07	1.38E-06	7.87E-07	-6.11E-04	
High-level radioactive waste, conditioned, to final repository (HLRW) [kg]	1.39E-05	1.11E-05	3.07E-08	7.28E-10	0	0	0	0	0	0	0	0	6.53E-10	1.26E-09	6.83E-10	-6.13E-07	
Intermediate- and low-level radioactive waste, conditioned, to final repository (ILLRW) [kg]	1.60E-02	1.37E-02	2.59E-05	7.98E-07	0	0	0	0	0	0	0	0	5.50E-07	1.38E-06	7.86E-07	-6.10E-04	
Components for re-use (CRU) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Materials for Recycling (MFR) [kg]	2.35E+00	2.35E+00	0	1.11E-01	0	0	0	0	0	0	0	0	0	5.18E+00	0	0	
Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

	Product Stage w/ grid electricity*	Product Stage w/ purchased renewables*	Construction Stage		Use Stage							End of Life		Benefits and Loads Beyond the System Boundary		
	A1-A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Total recovered energy exported from the product system (EEE and EET) [MJ]	5.61E+00	5.61E+00	0	1.95E-01	0	0	0	0	0	0	0	0	0	4.37E-01	0	0
Particulate matter [Disease incidences]	1.22E-06	1.18E-06	3.16E-08	9.83E-11	0	0	0	0	0	0	0	0	4.42E-10	1.31E-10	1.44E-10	-1.16E-07
Ionizing radiation, human health [kBq U235 eq.]***	2.74E+00	2.59E+00	2.18E-03	1.11E-04	0	0	0	0	0	0	0	0	4.65E-05	1.90E-04	1.16E-04	1.61E-02
Ecotoxicity, freshwater [CTUe]**	8.80E+01	8.34E+01	7.04E+00	2.75E-02	0	0	0	0	0	0	0	0	1.50E-01	2.52E-02	3.79E-02	-1.47E+01
Human toxicity, cancer [CTUh]**	9.23E-09	9.17E-09	1.64E-10	1.29E-12	0	0	0	0	0	0	0	0	2.73E-12	1.33E-12	2.65E-12	1.35E-09
Human toxicity, non-cancer [CTUh]**	1.36E-07	1.31E-07	2.65E-09	1.01E-10	0	0	0	0	0	0	0	0	5.57E-11	1.10E-10	2.31E-10	-3.46E-09
Land Use [Pt]**	7.92E+01	4.97E+01	1.58E+00	6.22E-03	0	0	0	0	0	0	0	0	3.37E-02	9.16E-03	6.08E-03	-4.67E+01

The life cycle modules are defined by EN 15804 as follows: Product Stage – raw material supply, transport, and manufacturing; Construction Stage – distribution and installation; Use Stage – use of installed product, maintenance, repair, replacement, refurbishment, operational energy use, and operational water use; End of Life - deconstruction, transport of waste, waste processing, and disposal; Benefits and Loads Beyond the System Boundary - credits from energy and material capture.

*Impacts in the “product stage w/ grid electricity” stage includes electricity from the grid and on-site renewables whereas “product stage w/ purchased renewables” also includes electricity from the grid (if any), on-site renewables (if any), and voluntary renewable electricity purchased by Haworth for production purposes.

**The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

***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.

As required by the construction products PCR, this EPD shall declare the energy source behind electricity used in the manufacturing process in A3 and its climate impact as kg CO2 eq./kWh (using the GWP-GHG indicator).

A3 Electricity Climate Impact

Site	Energy Source	GWP-GHG	Unit
Queluz, Portugal	National consumption mix	3.50E-01	kg CO2 eq / kWh
Queluz, Portugal	Renewable sources from supplier: hydro, solar, wind	1.45E-02	kg CO2 eq / kWh

Functional Unit	
Parameter	Value
Declared unit	1 seat for 1 individual maintained for a 10-year period
Number of occupants	1
Reference service life required	10 years
Biogenic carbon in product	0
Biogenic carbon in packaging	0

A4: Transport to the building site

Parameter	Value per functional unit	Value per functional unit
Transportation type	Truck	Ship
Fuel consumption (l/km)	0.42 diesel	4,240 kerosene
Distance	1,474 km	3 km
Capacity utilization	67%	66%
Capacity utilization volume factor	=1	=1
Weight of product (kg)		5.295
Volume (m ³)		0.272

A5: Installation in the building

Parameter	Value per functional unit
Packaging waste produced	0.14 kg
Installation Assumptions	No product waste, Installed with hand tools.

B2: Maintenance

Parameter	Value per functional unit
Maintenance Process	No maintenance is expected for this product
Maintenance cycle	0
Ancillary Materials for maintenance (kg/cycle)	0
Waste materials resulting from maintenance (kg)	0
Net fresh water consumption during maintenance (m ³)	0
Energy input during maintenance (kWh)	0

Reference service life (RSL)

Parameter	Value per functional unit
Reference service life	10 years
Design application parameters	Use as indicated in product brochure and warranty
Declared product properties	Properties given in product description on page 3
Indoor environment	Typical office and home environment
Use conditions	Typical office and home use

B3: Repair

Parameter	Value per functional unit
Repair process	No repairs are expected for this product
Inspection process	No repairs are expected for this product
Repair cycle (#/RSL)	0
Ancillary materials (kg)	0
Waste materials from repair (kg)	0
Net freshwater consumption during repair (m ³)	0
Energy input during repair (kWh)	0

B4: Replacement

Parameter	Value per functional unit
Replacement cycle (#/RSL)	0
Energy input during replacement (kWh)	0
Exchange of worn parts during the products life cycle (kg)	0

B5: Refurbishment

Parameter	Value per functional unit
Refurbishment process	No refurbishment is expected for this product
Refurbishment cycle (#/RSL)	0
Energy input during refurbishment (kWh)	0
Material input for refurbishment (kg)	0
Waste material resulting from refurbishment (kg)	0

B6 and B7: Use of energy and Use of Water

Parameter	Value per functional unit
Ancillary materials (kg)	0
Net freshwater consumption (m ³)	0
Power output of equipment (kW)	0
Characteristic performance	n/a

C1-C4: End-of-life

Parameter	Value per functional unit
Weight of product collected	5.295 kg
Weight to recycling	5.174 kg
Weight to energy recovery	0.037 kg
Weight to landfill	0.084 kg
Distance to recycling	32.2 km
Distance to energy recovery	32.2 km
Distance to landfill	32.2 km

LCA Results – Highest-Impact Configuration

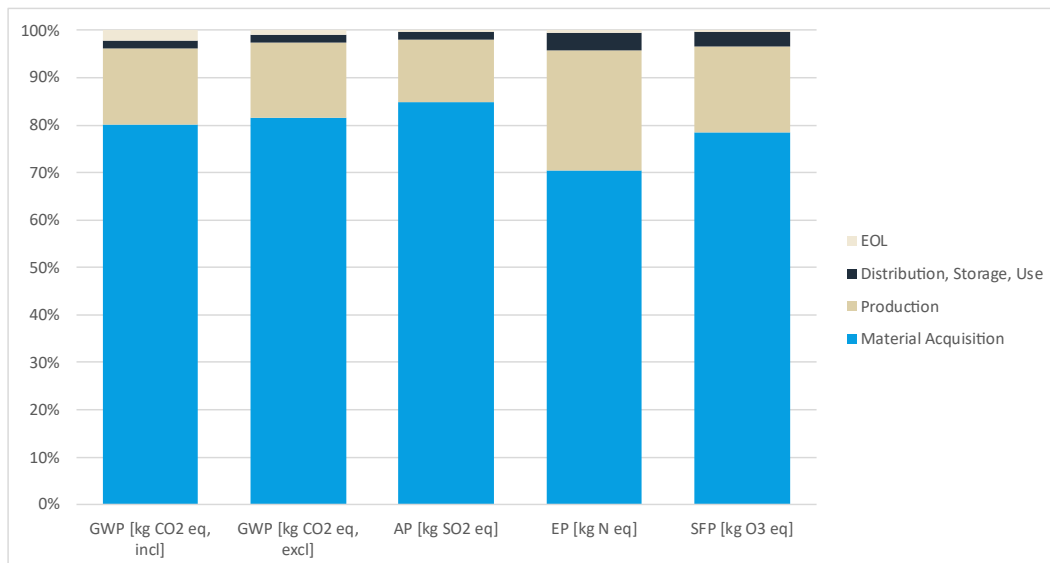
All results are given per functional unit, which is one unit of seating to seat one individual, maintained for a 10-year period. Results are reported separately by life cycle stage per the BIFMA PCR for seating.

Impact Category	Material Acquisition	Production w/ grid electricity*	Production w/ purchased renewables*	Distribution, Storage, Use	EOL	Total**
<i>IPCC AR6 LCIA Impacts</i>						
Global Warming Potential, incl biogenic [kg CO ₂ eq]	9.00E+01	1.81E+01	1.56E+01	1.70E+00	2.48E+00	1.12E+02
Global Warming Potential, excl biogenic [kg CO ₂ eq]	9.16E+01	1.80E+01	1.55E+01	1.70E+00	1.14E+00	1.12E+02
<i>TRACI 2.1 LCIA Impacts</i>						
Acidification Potential [kg SO ₂ eq]	3.74E-01	5.78E-02	5.37E-02	7.82E-03	1.07E-03	4.40E-01
Eutrophication Potential [kg N eq]	1.30E-02	4.66E-03	4.21E-03	6.93E-04	1.01E-04	1.85E-02
Ozone Depletion Potential [kg CFC 11 eq]	3.10E-09	1.55E-10	1.59E-10	4.38E-15	1.70E-09	4.95E-09
Smog Formation Potential [kg O ₃ eq]	4.56E+00	1.04E+00	9.60E-01	1.81E-01	2.25E-02	5.81E+00
<i>Resource Use Indicators</i>						
Renewable primary resources used as energy carrier [MJ]	1.39E+02	7.93E+01	1.34E+02	9.50E-01	2.13E-01	2.20E+02
Renewable primary resources with energy content used as material [MJ]	0.00E+00	9.10E+00	9.10E+00	0.00E+00	0.00E+00	9.10E+00
Renewable primary resources, total [MJ]	1.39E+02	8.84E+01	1.43E+02	9.50E-01	2.13E-01	2.29E+02
Non-renewable primary resources used as energy carrier [MJ]	8.64E+02	2.21E+02	1.80E+02	2.39E+01	1.95E+00	1.11E+03
Non-renewable primary resources with energy content used as a material [MJ]	1.74E+02	2.40E+01	2.40E+01	0.00E+00	0.00E+00	1.98E+02
Non-renewable primary resources, total [MJ]	1.04E+03	2.45E+02	2.04E+02	2.39E+01	1.95E+00	1.31E+03
Recovered energy [MJ]	0.00E+00	6.64E+00	6.64E+00	0.00E+00	1.13E+01	1.79E+01
Net fresh water usage [kg]	8.62E-01	1.46E-01	1.71E-01	3.26E-03	5.96E-03	1.02E+00

*Impacts in the “production w/ grid electricity” stage includes electricity from the grid and on-site renewables whereas “production w/ purchased renewables” also includes electricity from the grid (if any), on-site renewables (if any), and voluntary renewable electricity purchased by Haworth for production purposes.

**Includes material acquisition, production w/ grid, distribution, storage, use, and EOL.

The chart below presents the relative contribution of each life cycle stage to the TRACI 2.1 and IPCC environmental impact categories by life cycle stage per the BIFMA PCR for seating.



Additionally, results have been calculated using LCIA methodologies for core environmental impact categories specified in EN 15804+A2, as well as LCI indicators required by EN15804+A2. Results are reported per functional unit. For this product, 1 unit of product is required to meet the functional unit. The results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

	Product Stage w/ grid electricity*	Product Stage w/ purchased renewables*	Construction Stage		Use Stage							End of Life		Benefits and Loads Beyond the System Boundary		
	A1-A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG [kg CO2 eq.]	1.10E+02	1.07E+02	1.70E+00	6.53E-02	0	0	0	0	0	0	0	0	3.49E-02	9.82E-01	6.19E-02	-3.27E+01
Climate Change - total [kg CO2 eq.]	1.08E+02	1.06E+02	2.16E+00	5.10E-01	0	0	0	0	0	0	0	0	3.51E-02	1.43E+00	4.76E-01	-3.11E+01
Climate Change, fossil [kg CO2 eq.]	1.09E+02	1.07E+02	1.70E+00	5.26E-02	0	0	0	0	0	0	0	0	3.49E-02	9.82E-01	2.97E-02	-3.27E+01
Climate Change, biogenic [kg CO2 eq.]	-1.35E+00	-1.35E+00	4.57E-01	4.57E-01	0	0	0	0	0	0	0	0	1.37E-04	4.46E-01	4.46E-01	1.63E+00
Climate Change, land use and land use change [kg CO2 eq.]	2.25E-02	2.22E-02	1.93E-03	7.02E-06	0	0	0	0	0	0	0	0	3.67E-05	1.59E-05	2.59E-05	-5.50E-03
Ozone depletion [kg CFC-11 eq.]	3.24E-09	3.46E-09	2.08E-13	6.72E-14	0	0	0	0	0	0	0	0	4.11E-15	1.20E-09	5.02E-14	-4.12E-11
Acidification [Mole of H+ eq.]	5.10E-01	5.06E-01	8.37E-03	1.45E-04	0	0	0	0	0	0	0	0	1.27E-04	6.07E-04	9.62E-05	-1.06E-01
Eutrophication, freshwater [kg P eq.]	2.02E-04	1.98E-04	8.33E-06	3.17E-07	0	0	0	0	0	0	0	0	1.59E-07	5.65E-08	4.70E-06	-3.14E-05
Eutrophication, marine [kg N eq.]	9.06E-02	8.92E-02	4.22E-03	5.39E-05	0	0	0	0	0	0	0	0	6.28E-05	2.43E-04	3.44E-05	-2.02E-02
Eutrophication, terrestrial [Mole of N eq.]	9.79E-01	9.64E-01	4.65E-02	6.56E-04	0	0	0	0	0	0	0	0	6.93E-04	3.02E-03	2.59E-04	-2.13E-01
Photochemical ozone formation, human health [kg NMVOC eq.]	2.77E-01	2.73E-01	8.58E-03	1.44E-04	0	0	0	0	0	0	0	0	1.23E-04	6.37E-04	8.74E-05	-6.25E-02
Resource use, mineral and metals [kg Sb eq.]**	1.27E-04	1.27E-04	1.11E-07	7.62E-10	0	0	0	0	0	0	0	0	2.13E-09	-3.26E-08	7.97E-10	-2.17E-05
Resource use, fossils [MJ]**	1.48E+03	1.43E+03	2.22E+01	2.16E-01	0	0	0	0	0	0	0	0	4.62E-01	7.89E-01	4.45E-01	-5.35E+02
Water use [m³ world equiv.]**	1.93E+01	2.05E+01	9.88E-02	6.08E-02	0	0	0	0	0	0	0	0	1.89E-03	1.89E-01	-1.92E-04	-2.09E+00
Use of renewable primary energy (PERE) [MJ]	2.28E+02	2.82E+02	9.50E-01	4.28E-02	0	0	0	0	0	0	0	0	1.83E-02	1.12E-01	4.03E-02	-1.42E+02

	Product Stage w/ grid electricity*	Product Stage w/ purchased renewables*	Construction Stage				Use Stage							End of Life		Benefits and Loads Beyond the System Boundary	
	A1-A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Primary energy resources used as raw materials (PERM) [MJ]	9.10E+00	9.10E+00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total use of renewable primary energy resources (PERT) [MJ]	2.37E+02	2.91E+02	9.50E-01	4.28E-02	0	0	0	0	0	0	0	0	1.83E-02	1.12E-01	4.03E-02	-1.42E+02	
Use of non-renewable primary energy (PENRE) [MJ]	1.28E+03	1.24E+03	2.39E+01	2.19E-01	0	0	0	0	0	0	0	0	4.93E-01	7.89E-01	4.45E-01	-5.35E+02	
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	1.98E+02	1.98E+02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total use of non-renewable primary energy resources (PENRT) [MJ]	1.48E+03	1.44E+03	2.39E+01	2.19E-01	0	0	0	0	0	0	0	0	4.93E-01	7.89E-01	4.45E-01	-5.35E+02	
Input of secondary material (SM) [kg]	6.35E+00	6.35E+00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Use of non renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Use of net fresh water (FW) [m3]	1.01E+00	1.03E+00	3.26E-03	1.44E-03	0	0	0	0	0	0	0	0	6.23E-05	4.45E-03	9.84E-06	-6.17E-01	
Hazardous waste disposed (HWD) [kg]	3.40E-06	3.41E-06	6.86E-11	7.14E-12	0	0	0	0	0	0	0	0	1.31E-12	3.41E-12	3.71E-11	-4.04E-07	
Non-hazardous waste disposed (NHWD) [kg]	1.49E+01	1.49E+01	2.08E-03	4.14E-02	0	0	0	0	0	0	0	0	4.10E-05	8.73E-02	4.65E-01	-5.09E+00	
Radioactive waste disposed (RWD) [kg]	3.11E-02	2.88E-02	6.84E-05	8.72E-06	0	0	0	0	0	0	0	0	1.31E-06	3.47E-05	5.25E-06	-2.66E-02	
High-level radioactive waste, conditioned, to final repository (HLRW) [kg]	2.74E-05	2.47E-05	8.12E-08	7.24E-09	0	0	0	0	0	0	0	0	1.56E-09	4.68E-08	4.57E-09	-1.50E-05	
Intermediate- and low-level radioactive waste, conditioned, to final repository (ILLRW) [kg]	3.11E-02	2.88E-02	6.83E-05	8.72E-06	0	0	0	0	0	0	0	0	1.31E-06	3.47E-05	5.25E-06	-2.66E-02	
Components for re-use (CRU) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Materials for Recycling (MFR) [kg]	2.28E+00	2.28E+00	0	4.22E-01	0	0	0	0	0	0	0	0	0	1.22E+01	0	0	
Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

	Product Stage w/ grid electricity*	Product Stage w/ purchased renewables*	Construction Stage				Use Stage							End of Life		Benefits and Loads Beyond the System Boundary	
	A1-A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Total recovered energy exported from the product system (EEE and EET) [MJ]	6.64E+00	6.64E+00	0	2.16E+00	0	0	0	0	0	0	0	0	0	9.10E+00	0	0	
Particulate matter [Disease incidences]	1.26E-05	1.25E-05	8.36E-08	8.89E-10	0	0	0	0	0	0	0	0	1.32E-09	3.19E-09	9.50E-10	-9.89E-07	
Ionizing radiation, human health [kBq U235 eq.]***	4.75E+00	4.60E+00	5.77E-03	1.36E-03	0	0	0	0	0	0	0	0	1.11E-04	2.42E-03	7.75E-04	-5.59E+00	
Ecotoxicity, freshwater [CTUe]**	4.48E+02	4.43E+02	1.86E+01	1.16E-01	0	0	0	0	0	0	0	0	4.00E-01	3.25E-01	3.70E-01	-1.49E+02	
Human toxicity, cancer [CTUh]**	1.16E-06	1.16E-06	4.33E-10	5.98E-12	0	0	0	0	0	0	0	0	7.18E-12	2.68E-11	1.91E-11	-1.01E-08	
Human toxicity, non-cancer [CTUh]**	1.03E-06	1.02E-06	7.01E-09	2.67E-10	0	0	0	0	0	0	0	0	1.46E-10	2.13E-09	1.62E-09	-2.71E-07	
Land Use [Pt]**	3.78E+02	3.49E+02	4.19E+00	5.37E-02	0	0	0	0	0	0	0	0	7.97E-02	1.02E-01	3.95E-02	-3.87E+02	

The life cycle modules are defined by EN 15804 as follows: Product Stage – raw material supply, transport, and manufacturing; Construction Stage – distribution and installation; Use Stage – use of installed product, maintenance, repair, replacement, refurbishment, operational energy use, and operational water use; End of Life - deconstruction, transport of waste, waste processing, and disposal; Benefits and Loads Beyond the System Boundary - credits from energy and material capture.

*Impacts in the “product stage w/ grid electricity” stage includes electricity from the grid and on-site renewables whereas “product stage w/ purchased renewables” also includes electricity from the grid (if any), on-site renewables (if any), and voluntary renewable electricity purchased by Haworth for production purposes.

**The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

***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.

As required by the construction products PCR, this EPD shall declare the energy source behind electricity used in the manufacturing process in A3 and its climate impact as kg CO2 eq./kWh (using the GWP-GHG indicator).

A3 Electricity Climate Impact			
Site	Energy Source	GWP-GHG	Unit
Queluz, Portugal	National consumption mix	3.50E-01	kg CO2 eq / kWh
Queluz, Portugal	Renewable sources from supplier: hydro, solar, wind	1.45E-02	kg CO2 eq / kWh

Functional Unit	
Parameter	Value
Declared unit	1 seat for 1 individual maintained for a 10-year period
Number of occupants	1
Reference service life required	10 years
Biogenic carbon in product	1.99 kg C
Biogenic carbon in packaging	1.02 kg C

A4: Transport to the building site

Parameter	Value per functional unit	Value per functional unit
Transportation type	Truck	Ship
Fuel consumption (l/km)	0.42 diesel	4,240 kerosene
Distance	1,474 km	3 km
Capacity utilization	67%	66%
Capacity utilization volume factor	=1	=1
Weight of product (kg)		13.575
Volume (m ³)		0.295

A5: Installation in the building

Parameter	Value per functional unit
Packaging waste produced	0.79 kg
Installation Assumptions	No product waste, Installed with hand tools.

B2: Maintenance

Parameter	Value per functional unit
Maintenance Process	No maintenance is expected for this product
Maintenance cycle	0
Ancillary Materials for maintenance (kg/cycle)	0
Waste materials resulting from maintenance (kg)	0
Net fresh water consumption during maintenance (m ³)	0

Reference service life (RSL)

Parameter	Value per functional unit
Reference service life	10 years
Design application parameters	Use as indicated in product brochure and warranty
Declared product properties	Properties given in product description on page 3
Indoor environment	Typical office and home environment
Use conditions	Typical office and home use

B3: Repair

Parameter	Value per functional unit
Repair process	No repairs are expected for this product
Inspection process	No repairs are expected for this product
Repair cycle (#/RSL)	0
Ancillary materials (kg)	0
Waste materials from repair (kg)	0
Net freshwater consumption during repair (m ³)	0
Energy input during repair (kWh)	0

B4: Replacement

Parameter	Value per functional unit
Replacement cycle (#/RSL)	0
Energy input during replacement (kWh)	0
Exchange of worn parts during the products life cycle (kg)	0

B5: Refurbishment

Parameter	Value per functional unit
Refurbishment process	No refurbishment is expected for this product
Refurbishment cycle (#/RSL)	0
Energy input during refurbishment (kWh)	0
Material input for refurbishment (kg)	0
Waste material resulting from refurbishment (kg)	0

B6 and B7: Use of energy and Use of Water

Parameter	Value per functional unit
Ancillary materials (kg)	0
Net freshwater consumption (m ³)	0
Power output of equipment (kW)	0
Characteristic performance	n/a

C1-C4: End-of-life

Parameter	Value per functional unit
Weight of product collected	13.575 kg
Weight to recycling	12.106 kg
Weight to energy recovery	0.968 kg
Weight to landfill	0.501 kg
Distance to recycling	32.2 km
Distance to energy recovery	32.2 km
Distance to landfill	32.2 km

Modules Declared and Data Variation

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage	
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential	
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	GLO	GLO	GLO	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	
Specific data used - Lowest Impact Configuration	11%			-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Specific data used - Highest Impact Configuration	2%			-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation - products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation - sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-	

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