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Programme: The International EPD® System
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Programme operator: EPD International AB

Postura+ Chair

Environmental Product Declaration

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

EPD registration number: S-P-02067
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VERIFICATION
Third Party Verifier:
Chris Foster, EuGeos Limit

Introduction

This Environmental Product Declaration (EPD) is for KI's Postura chair Size 6. This is cradle to grave EPD based upon production information and data collected by KI from their producers in 2020.

KI has the sole ownership, liability and responsibility of this EPD.

This EPD was modelled in SimaPro 9.0.0.24 using data from Ecoinvent version 3.5.
"EPDs within the same product category but from different programmes may not be comparable."

Programme Information

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Product category rule: Seats Product Group Classification: UN CPC 3811. Version 3. Valid until 2024-04-17.

PCR reviewed by: LEO BREEDVELD, 2B SRL

EPD registration number: S-P-02067

CPC code: 3811

Type of EPD: Cradle to grave
EPD geographical scope: Europe
Product Codes: POPC06002
Declared unit: One chair in use for 15 years.

Third Party Verifier: Chris Foster, EuGeos Limited

Approved by: The International EPD® System
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐EPD process certification ☑EPD verification

Life Cycle Assessment (LCA) conducted by: Giraffe Innovation Ltd.
www.giraffeinnovation.com

Company Profile

KI's furniture helps the world's leading organisations create happy, healthy, high performing working and learning environments for their people. Bringing together good design, advanced engineering and sustainable resources, KI's products are durable, flexible and offer excellent value.

Founded in 1941, KI has grown to become one of the world's largest, most respected furniture manufacturing groups. KI's EMEA headquarters in London is supported by an established network of manufacturing facilities and distribution partners across the region. For more information, visit: www.kieurope.com

Standards

The Postura chairs have been tested and approved to the following standards:

- BS EN 1729 Part 1, Furniture. Chairs and tables for educational institutions. Functional dimensions;
- BS EN 1729 Part 2, Furniture. Chairs and tables for educational institutions. Safety requirements and test methods;
- BS 5852 (Crib5) certified Methods of test for assessment of the ignitability of upholstered seating by smouldering and flaming ignition sources;
- BS EN 1022: 2018 (Size 5&6) certified Furniture. Seating. Determination of stability;
- BS EN 16139: 2013 Level 2 (Size 6) certified. Furniture. Strength, durability and safety. Requirements for non-domestic seating

The chair is also FIRA certified.
The safe vertical stacking for the chair is up to 12 high.

Product Description

The Postura chair is designed to promote good posture and provide exceptional comfort. It is proven to be durable, comfortable and offers excellent value for money.
Made in the Tamworth, Staffordshire, UK for KI from high impact resistant polypropylene. The legs are CO_2 gas injected, which increases the strength and reduce the products weight. The CO_2 is captured from the air on the moulding site.
The chairs are available in a range of vibrant colours, they are strong, light, stain resistant, antistatic and easy to clean.

Size	Seat height (mm)	Seat width (mm)	Overall height (mm)	Overall depth (mm)	Weight (kg)
1	260	250	500	330	1.7
2	310	280	550	365	1.8
3	350	280	645	420	2.8
4	380	340	675	440	3
5	430	360	780	530	3.9
6	460	400	805	540	4

Table 1: Postura size range

This EPD applies to the Size 6, Ink Blue Postura chair, product code POPC06002.
The product weighs approximately 4kg.

Figure 1: Colour range

For delivery each chair is stacked onto a pallet to a total of 56 units per pallet. These stacks are then secured to the pallet with two straps and shrink wrap. 65% of the output remains in this palletised form for distribution. 30% are stacked directly on the payload area of a vehicle without any packaging. The remaining 5% of chairs are boxed for a maximum of two per box.

The distance from the factory to the warehouse is 25km. The average delivery distance to a customer is 195km using a 18t Euro 5 lorry. The pallets have a typical lifespan of 10 uses[1].

All of the products are warrantied for 20 years. KI recommended that the product is cleaned with a soft damp cloth and mild all-purpose cleaner.

At the end of life, the products can be reused recycled or disposed of. For this EPD it is assumed that 15% of the items are reused and 84% recycled and 1% landfilled. It is assumed that the product packaging is either recycled, incinerated or landfilled and the percentage of each is dependent upon the different types of material[2].

Material	% recovery/recycling rate
Paper and cardboard	79%
Polymers	46.2%
Wood	31.4%

Table 2: Packaging material recovery and recycling rates

It is assumed that the distance they travel for recycling, reuse or disposal is an average of 50km.

Materials

The polypropylene used for moulding the chair is sourced from Europe.

The carton board is assumed to contain 75% recycled content as defined in the Ecoinvent dataset.

Products

This EPD covers the Size 6, Ink Blue Postura chair, product code POPC06002.
The following is a breakdown of the product including packaging.

Material	% of mass
Polymers	88%
Wood	12%
CO_2	<1%

Table 3: Postura chair material and packaging by % mass

[1] https://circulareconomy.europa.eu/platform/en/good-practices/reuse-and-recycling-loading-pallets

[2] Defra UK statistics on waste March 2019

EPD Scope

This is a cradle to grave EPD which is broken down as required into the following processes:

- Upstream processes (cradle to gate) - material and parts production;
- Core processes (gate to gate) - moulding of the chair packaging, storage and recycling of waste plastic; and
- Downstream process (gate to grave) distribution, use and end of life recycling or disposal

The inputs and outputs and travel are captured in each process as shown in Figure 2.

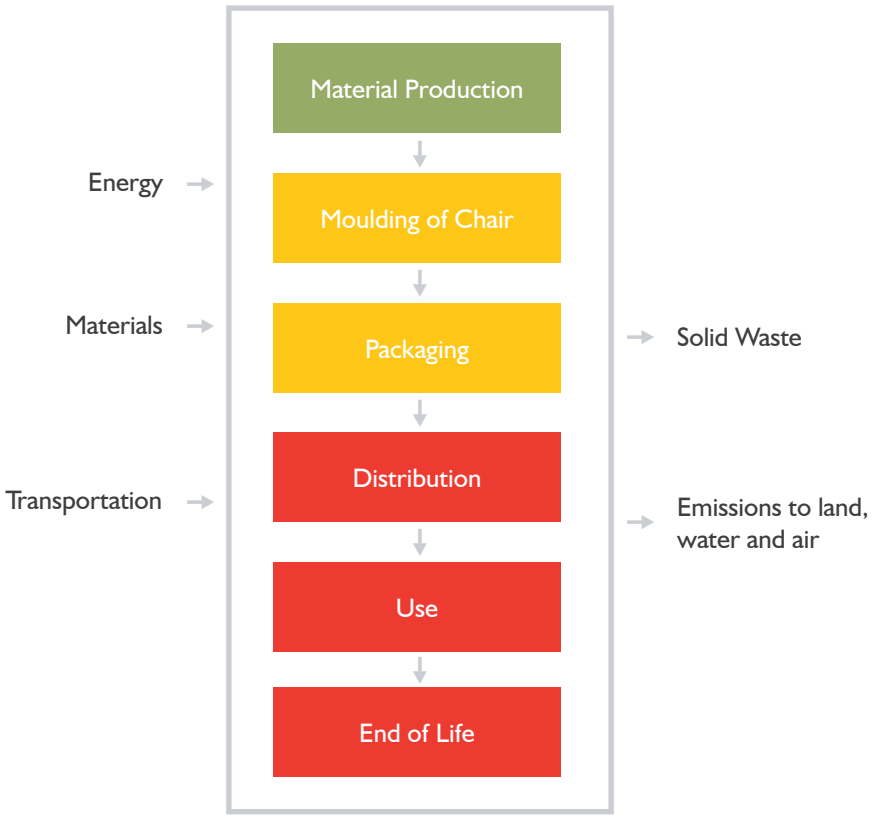

Figure 2: Product life cycle and boundary

Functional Unit

The functional unit is chair size 6 Ink Blue Postura chair used for 15 years. The warranty period is 20 years.
The analysis conforms to ISO 14044 standard which acknowledges the life cycle assessment requirements of key phases beginning with goal and scope definition, inventory, analysis, impact assessment, and interpretation. Each of these phases, along with their associated databases and models, can have associated uncertainties. It is important to acknowledge these uncertainties in decisions regarding design development and improvement, strategic planning, public policy making, or product marketing.

The key sources of data used for the LCA were as follows:

- Primary data was supplied by KI and their manufacturing contractors
- Ecoinvent v3.5 database (2018), standard data sets on energy, environmental impacts of moulding processes, material production, waste disposal and recycling

Data Source and Data Quality

The analysis conforms to ISO 14044 series standard which acknowledges the life cycle assessment requirements of key phases beginning with goal and scope definition, inventory, analysis, impact assessment, and interpretation. Each of these phases, along with their associated databases and models, can have associated uncertainties. It is important to acknowledge these uncertainties in decisions regarding design development and improvement, strategic planning, public policy making, or product marketing.

The key sources of data used for the LCA were as follows:

- Primary data was supplied by KI and manufacturing contractors; and
- Ecoinvent v3.5 database (2018), standard data sets on energy, environmental impacts of moulding processes, material production, waste disposal and recycling
- Data on materials and material sourcing, production energy use, waste, logistic, use etc was collected from KI based upon 2019 and 2020 production

Exclusions and Cut-Off Criteria

When building a life cycle inventory, it is typical to exclude items considered to have a negligible contribution to results. To do this in a robust manner there must be confidence that the exclusion is fair and reasonable. Therefore, cut-off criteria are defined, which allow items to be neglected if they meet the criteria. In this study exclusions could be made if they were expected to be within the below criteria:

- Mass: if a flow is anticipated to be less than 1% of the mass of the product it may be neglected;
- Energy: if a flow is anticipated to be less than 1% of the cumulative energy it may be neglected; and
- Environmental significance: if a flow is anticipated to be less than 1% of the key impact categories it may be excluded.

If an item meets one of the criteria but is expected to be significant to one of the other criteria it may not be neglected. For example, if a chemical is small in mass but is expected to have a notable contribution to the environmental results then it may not be excluded.

Life cycle stages that have been omitted from the scope of the study include the following:

- Human energy inputs to processes;
- Infrastructure and capital goods; and
- Transport of employees to and from their normal place of work

Allocation

Ecoinvent default allocation was applied to all processes, except for secondary material use, where cut off allocation is applied.

Assumptions and Estimates

The following assumptions were made:

- Indicative transport modes including lorry and ship type used for the transportation of the materials;
- Production losses through all the processes and these have been based upon supplied data;
- Primary energy used as materials was calculated based upon the gross calorific values of materials;.
- Primary energy used as fuel was calculated by deducting the energy used as materials from the primary energy demand; and
- Secondary materials used including the recycled steel, carton board recycled content and the used pallets.

Environmental Results

The results of the environmental analysis in accordance with the PCR are shown in the tales below.

Parameter		Unit	Upstream	Core	Downstream	Total
Global Warming Potential (GWP)	Fossil kg CO_2 eq.	kg CO_2 eq.	8.39E+00	8.38E-01	5.66E+00	1.49E+01
	Biogenic kg CO_2 eq.	kg CO_2 eq.	4.83E-02	4.82E-02	3.09E-02	1.27E-01
	Land use and land transformation	kg CO_2 eq.	1.63E-04	3.91E-04	2.91E-02	2.97E-02
	TOTAL	kg CO_2 eq.	8.44E+00	8.87E-01	5.72E+00	1.50E+01
Acidification potential (AP)		kg SO_2 eq.	2.66E-02	3.22E-03	1.02E-03	3.09E-02
Eutrophication potential (EP)		kg PO_4^3 eq.	3.17E-03	8.16E-04	6.40E-02	6.80E-02
Formation potential of tropospheric ozone (POCP)		kg $C2H_4$ eq.	3.27E-02	2.82E-03	1.66E-03	3.72E-02
Abiotic depletion potential – Elements (ADPE)		kg Sb eq.	1.14E-06	1.43E-06	7.01E-07	3.27E-06
Abiotic depletion potential – Fossil fuels (ADPF)		MJ, net calorific value	2.64E+02	1.45E+01	3.55E+00	2.82E+02
Water scarcity potential		m^3 eq.	2.61E+00	3.13E-01	7.59E-01	3.68E+00

Table 4: Environmental impacts

Parameter		Unit	Upstream	Core	Downstream	Total
Primary energy resources - Renewable	Use as energy carrier (PERE)	MJ, net calorific value	-5.6E+00	1.63E+01	9.38E+01	-3.4E+00
	Use as raw material (PERM)	MJ, net calorific value	8.00E+00	0.00E+00	0.00E+00	8.00E+00
	Total (PERT)	MJ, net calorific value	2.04E+00	1.63E+00	9.38E.01	3.90E+02
Primary energy resources - Non-renewable	Use as energy carrier (PENRE)	MJ, net calorific value	1.35E+02	1.75E+00	7.19E+01	2.25E+02
	Use as raw material (PENRM)	MJ, net calorific value	1.65E+02	0.00E+00	0.00E+00	1.65E+02
	Total (PENRT)	MJ, net calorific value	3.01E+02	1.75E+00	7.19E-01	3.90E+02
Secondary material (SM)		kg	5.00E-01	0.00E+00	0.00E+00	3.73E+01
Renewable secondary fuels (RSF)		MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable secondary fuels (NRSF)		MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water (FW)		m^3	8.66E+00	2.25E-02	2.60E-01	9.15E+00

Table 5: Use of resources

Parameter	Unit	Upstream	Core	Downstream	Total
Hazardous waste disposed (HWD)	kg	4.31E-06	4.13E-05	3.89E-06	**4.95E-05**
Non-hazardous waste disposed (NHWD)	kg	3.12E-01	1.26E+00	4.29E+00	**5.86E+00**
Radioactive waste disposed (RWD)	kg	3.30E-05	1.01E-04	3.32E-05	**1.68E-04**

Table 6: Waste production

Parameter	Unit	Upstream	Core	Downstream	Total
Components for reuse (CRU)	kg	0.00E+00	0.00E+00	5.66E-01	**5.66E-01**
Material for recycling (MFR)	kg	0.00E+00	1.72E-01	3.33E+00	**3.50E+00**
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	3.51E-01	**3.51E-01**
Exported energy, electricity (EEE)	MJ	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
Exported energy, thermal (EET)	MJ	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**

Table 7: Output flows

Parameter	Unit	Upstream	Core	Downstream	Total
Human toxicity, cancer impacts cases	Cases	2.06E-07	2.89E-08	9.28E-07	**1.16E-06**
Human toxicity, non-cancer impacts cases	Cases	1.16E-07	1.16E-07	5.01E-06	**5.24E-06**
Fresh water ecotoxicity	PAF.m3.day	5.80E+03	3.66E+02	8.02E+02	**6.97E+03**
Land use	Species. Yr.	1.52E-10	7.84E-10	6.51E-10	**1.59E-09**

Table 8: Other environmental impacts

References

Product category rule: Seats. Product category classification : UN CPC 3811. Version 3. Valid until 2024-04-17.

General Programme Instructions for The International EPD® System Version 3.01. 2019-09-18.

Ecoinvent v3.5 database (2018).

ISO 14025:2006, Environmental labels and declarations – Type III Environmental declarations – Principles and procedures

ISO/TS 14027 Environmental labels and declarations -- Development of product category rules

ISO 14040 Environmental management – Life cycle assessment – Principles and framework

ISO 14044 Environmental management – Life cycle assessment – Requirements and guidelines

ISO 14046:2014, Environmental management – Water footprint – Principles, requirements and guidelines

ISO 19011 Guidelines for Auditing Management Systems

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