

ENVIRONMENTAL PRODUCT DECLARATION

Bell Chair

Magis SpA



EPD program: International EPD System (www.environdec.com)
Program operator: EPD International AB
Reference PCR: PCR 2009:02 v3.0 "Seats" CPC Code: 3811
Reference standard: ISO 14025
Publication date: 2021-03-15
Validity date: 2026-03-14
Revision date: 2023-07-17
Registration number: S-P-03320



Note: an EPD should provide up-to-date information and can be updated if conditions change. The declared validity is therefore subject to registration and continuous publication on www.environdec.com.

Magis Spa, via Triestina, Accesso E - Z.I. Ponte Tezze 30020 Torre di Mosto - Ve / Italia
Telephone number & e-mail adress: Tel. +39 0421 319600 | info@magisdesign.com

MAGIS

Index

Company and product.....	3
Environmental information.....	5
Information on the company and certification	13
References.....	15

Company and product

For more than 40 years we have been creating design products for the home, office and contract. Magis was founded in 1976 in Northern Italy. Since then we have become a global player in the world of design, always remaining faithful to our essence: to redefine the horizons of design. We are always looking for new ideas, new design languages and innovative production methods. Our portfolio therefore ranges from the most puristic to the most expressive lines. Some will say that Magis is eclectic. We are a family-run company and we believe in strong family values. We help each other to grow together. What we care about is building lasting and positive relationships with our employees, customers and partners. To strengthen our community, we produce in Italy. In this way, we help preserve the exceptional craftsmanship for which our region has been known for centuries. Each Magis product is made to the highest possible quality and reflects the extraordinary skills and expertise of our employees. True to our vision, we are always looking for exceptional talent in design. Many of them have become famous around the world during this journey: figures such as Jasper Morrison, Konstantin Grcic, Philippe Starck, Ronan & Erwan Bouroullec and Jerszy Seymour have been with us.

The structure of the Bell Chair is in regenerated polypropylene mixed with glass fibre, obtained from the waste generated by the production of Magis furniture and by the local automotive industry. The chairs are available in 3 colours: *Sunrise*, *High Noon* and *Midnight*. This EPD is valid for all three Bell Chair colours. This document reports the results of the *High Noon* Bell Chair.

CHAIR			PACKAGING						
Material	kg	%	Material	x4		x12		x16	
				kg	%	kg	%	kg	%
PP pre-consumer	2.075	72.5%	Paper	0.002	0.2%	0.005	0.2%	0.004	0.2%
Glass fibre	0.656	22.9%	Cardboard	0.825	76.1%	0.433	21.8%	0.357	23.4%
Master PP	0.114	4.0%	Plastic	0.257	23.7%	0.725	36.5%	0.544	35.7%
PE	0.018	0.6%	Wood	0.000	0.0%	0.825	41.5%	0.619	40.6%
Total	2.863	100.0%	Total	1.084	100.0%	1.988	100.0%	1.524	100.0%

Table 1 contains the materials used for the construction of the chair and for the packaging.

CHAIR			PACKAGING						
Material	kg	%	Material	x4		x12		x16	
				kg	%	kg	%	kg	%
PP pre-consumer	2.075	72.5%	Paper	0.002	0.2%	0.005	0.2%	0.004	0.2%

MAGIS

Glass fibre	0.656	22.9%	Cardboard	0.825	76.1%	0.433	21.8%	0.357	23.4%
Master PP	0.114	4.0%	Plastic	0.257	23.7%	0.725	36.5%	0.544	35.7%
PE	0.018	0.6%	Wood	0.000	0.0%	0.825	41.5%	0.619	40.6%
Total	2.863	100.0%	Total	1.084	100.0%	1.988	100.0%	1.524	100.0%

Table 1 - List of materials of Bell Chair and its packaging related to a chair.

Environmental information

The aim of this EPD is the LCA assessment of the entire Bell Chair life cycle through the quantification of environmental impacts.

LCA approach

The approach used to conduct the LCA study is attributive. The attributive model of the life cycle of a product represents the evaluation of the real, average or specifically estimated supply chain.

Declared unit

In accordance with the guidelines contained in the PCR 2009:02 v3.0 [5], the functional unit of the LCA is represented by a unit of furniture (including its packaging) maintained during its life, in this case the Bell Chair. The life span of the product corresponds to the time during which the chair maintains its function. In the absence of statistical data, the life expectancy of Bell Chair is set with the default value of 15 years.

System boundaries

The system boundaries considered for this study are “from cradle to grave”, therefore from the extraction of raw materials to the final disposal of the product.

The Bell Chair life cycle study is divided into Upstream, Core and Downstream processes, as required by PCR 2009:02 v3.0 [5] (Figure 1).

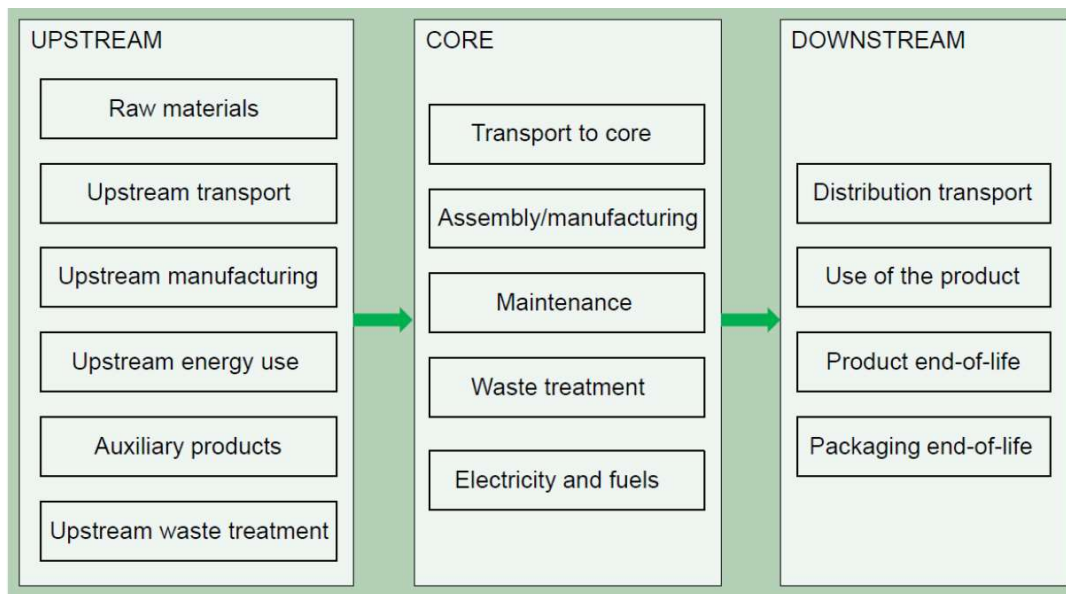


Figure 1 - System boundaries according to PCR 2009:02 v3.0 [5].

Specifically, in this study, the Upstream processes include the extraction of raw materials and their transport, the production of finished products (polypropylene, fiberglass, etc.), the production of the chair, the chair feet, its pallet and packaging.

The Core processes include: the transport of the monobloc chair from the supplier to the Magis storage warehouse and the consumption of the company itself. The production and assembly of the product are carried out at a Magis supplier company.

Downstream processes include the distribution of the packaged product and the end of life of the packaging and the product.

Geographic and temporal representativeness of the data

Magis headquarters are in Torre di Mosto in the province of Venice. The primary data, used for the most significant processes, refer to production in 2022. The secondary data are present in the ecoinvent v3.8 database, published in 2021 [6].

Specific data are used to describe the production phase of the elements of the chair, assembly and storage in the warehouse; generic data are used to describe the procurement phases of raw materials, packaging and downstream phases (use phase, recycling, disposal). Specific data comes from the manufacturer and major suppliers, while generic data is selected from the LCA database of ecoinvent v3.8 [6].

The data assumptions at the disposal stage are justified by the recycling properties of the materials and generic disposal data typical of each country.

The study refers to the Italian situation for upstream production processes. The product is sold in Italy and abroad.

Allocation

Allocation represents the allocation procedure according to which the inputs and outputs of the system are divided between the different products in order to reflect the underlying physical relationships. The production processes of the raw materials in this study do not involve the formation of by-products, for which it is therefore not necessary to apply criteria for allocating environmental loads.

As regards the allocation related to the end of life, the “cut-off” approach is adopted. With this type of approach, the outputs subject to recycling are considered inputs for the next life cycle, so no type of allocation is made for materials subject to recycling. Neither the gains nor the environmental burdens resulting from the recycling process are assigned to the waste stream. However,

the collection and transport of waste to the recycling plant are included in the analysis.

The allocation was applied on the basis of the mass criterion of the packaged product and of the total mass of the pieces produced in 2022 for the consumption of electricity, heat, water and the company waste produced. Only the consumption inherent in the warehouse is considered, while consumption related to offices is excluded.

Simplifications in the LCA

- It has been assumed that the company's capital assets (such as machinery and buildings) do not make a significant contribution to the life cycle assessment, therefore they are not considered in the analysis of the product system;
- Maintenance and use phase of the chair have been excluded;
- The ecoinvent database v.3.8 was used for secondary data [6];
- To facilitate the calculations of the LCA and the presentation of the results, the LCA software SimaPro v.9.4 [7] was used.

Emissions of CO2

The carbon footprint calculation uses the 100-year global warming potential (GWP100). The carbon footprint includes greenhouse gas emissions and removals from fossil fuels, biogenic sources and direct land use change. The emissions are distinct for the different sources.

Other environmental information

None of the substances present in the current version of the “Candidate List” European regulation 1907/2006 / EC (REACH Registration, Evaluation, Authorization and Restriction of Chemicals) is present in a concentration greater than 0,1% by weight in the marketed product. Furthermore, we declare that the product is not subject to classification or labelling pursuant to Directive 67/548 / EC and Regulation EC No. 1272/2008 (CLP) as it is considered an article and therefore outside their scope of application.

Inventory analysis

This LCA study is based on primary data for the fundamental aspects of the study, such as the weight of the components and packaging materials. The primary data of the LCA were collected by Magis and concern the weights of all the components of the chair, packaging, some production processes and sales data.

Secondary data is used for all processes for which primary data are not available, such as the production of packaging, the processing of some raw materials and the disposal of the final product and its packaging. The ecoinvent database v.3.8 is used for the secondary data used in the study [6], allocation, cut-off by classification and literature data is used. The ecoinvent database is available in the SimaPro v.9.4 software used for the calculations [7].

For the main components of the chair, primary data relating to the materials making up the chair and the consumption of the production processes were obtained from the supplier. The components of the chair for which primary data have been made available are: the monobloc chair in regenerated polypropylene mixed glass fibre and the pallet of the same material, the polyethylene feet and the relative packaging.

The energy consumption for the production of the chair was obtained by considering the primary data from Magis' supplier related to granulation and extrusion with addition of glass fibre. The supplier's plant utilizes a share of photovoltaic energy from its panels installed on the plant's roof. The remaining part is purchased from the national grid, and has been represented using the national residual energy mix. The energy purchased by Magis is represented by the residual energy mix for Italy. The chair is manufactured at the Magis supplier's factory.

For the packaging methods of the Bell Chairs, the information obtained from the 2022 sales data have been used: the three packaging formats have been considered, consisting in 4, 12 and 16 monobloc Bell Chair chairs with a Bell Pallet were stacked for each packaging.

For the Magis plant, consumption was allocated on the basis of the mass criterion of the packaged product and the total mass of parts produced in 2022.

For the distribution and disposal of the product, the 2022 sales figures were considered, and three scenarios have been modelled based on the sales of each packaging format (x4, x12 and x16).

The distribution phase considers the distance between Magis and a final reseller of the product to the customer. For land transport in European countries, road transport is assumed (ecoinvent database process: “Transport, freight, lorry 16-32 metric ton, euro5” and “Transport, freight, lorry> 32 metric ton, euro4”) from the plant of Magis up to the evaluated country. The distance from a final reseller to the customer was also considered in the mileage of road transport. For transport by sea to non-European countries, a transport by ship is assumed (ecoinvent database process: “Transport, freight, sea, container ship”) from the Magis site to the evaluated country. distances were calculated with Google Maps [8] e SeaRates [9].

For the transport of the product and packaging at the end of its life, a road transport is assumed (ecoinvent database process: “Transport, freight, lorry 16-32 metric ton, euro4”) for 100 km. Eurostat and OECD data were used to set up the disposal scenario [10][11] in reference to the sales data of the product.

The use of proxy data does not exceed the limit of 10% of the overall impact of the main impact categories, as required by the reference PCR.

Impact assessment

To evaluate the environmental performance of the product, the PCR method was used, created with the indicators indicated in the same document.

PCR method

For the evaluation of the environmental performance of the product, the method defined by the PCR 2009:02 v3.0 [5].

In the following table, the values of environmental impact indicators are available for the life cycle of 1 Bell Chair in the “High Noon” colour. The values are reported separately for the Upstream, Core and Downstream phases the total value for each indicator is reported as well.

The indicators “Materials for energy recovery”, “Exported energy, thermal” and “Exported energy, electricity” have been calculated assuming that the product is sold to “home” end users. The waste will be handled by the municipal service, so the incineration with energy recovery happens outside of the system boundary.

Impact category	Unit	Total	Upstream	Core	Downstream
Climate change	<i>kg CO2 eq</i>	1,09E+01	4,30E+00	8,38E-01	5,74E+00
Climate change - Fossil	<i>kg CO2 eq</i>	9,57E+00	4,85E+00	7,03E-01	4,02E+00
Climate change - Biogenic	<i>kg CO2 eq</i>	1,30E+00	-5,54E-01	1,35E-01	1,72E+00
Climate change - Land use and LU change	<i>kg CO2 eq</i>	5,28E-03	4,75E-03	9,18E-05	4,45E-04
Ozone depletion	<i>kg CFC11 eq</i>	9,07E-07	5,63E-07	1,16E-07	2,28E-07
Acidification	<i>mol H+ eq</i>	4,08E-02	3,07E-02	1,96E-03	8,09E-03
Eutrophication, freshwater	<i>kg P eq</i>	1,53E-03	1,40E-03	6,60E-05	6,68E-05
Eutrophication, marine	<i>kg N eq</i>	8,62E-03	5,52E-03	3,98E-04	2,70E-03
Eutrophication, terrestrial	<i>mol N eq</i>	8,35E-02	5,39E-02	4,03E-03	2,55E-02
Photochemical ozone formation	<i>kg NMVOC eq</i>	2,48E-02	1,63E-02	1,27E-03	7,20E-03
Resource use, minerals and metals	<i>kg Sb eq</i>	4,68E-05	4,23E-05	1,23E-06	3,27E-06
Resource use, fossils	<i>MJ</i>	1,08E+02	8,18E+01	1,09E+01	1,50E+01
Water use (AWARE)	<i>m3</i>	2,13E+00	1,95E+00	1,25E-01	5,33E-02
Particulate matter	<i>disease inc.</i>	3,52E-07	2,53E-07	1,61E-08	8,34E-08
Ionising radiation	<i>kBq U-235 eq</i>	7,54E-01	6,33E-01	4,52E-02	7,56E-02
Ecotoxicity, freshwater	<i>CTUe</i>	7,81E+01	6,07E+01	4,76E+00	1,27E+01
Human toxicity, cancer	<i>CTUh</i>	5,51E-09	4,60E-09	1,31E-10	7,76E-10
Human toxicity, non-cancer	<i>CTUh</i>	1,49E-07	1,30E-07	3,43E-09	1,56E-08
Land use	<i>Pt</i>	8,27E+01	7,08E+01	2,14E+00	9,74E+00
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	<i>MJ</i>	1,08E+02	3,30E+00	1,09E+01	9,34E+01
Use of non-renewable primary energy resources used as raw materials	<i>MJ</i>	0,00E+00	7,84E+01	0,00E+00	-7,84E+01
Total use non-renew. primary energy res.	<i>MJ</i>	1,08E+02	8,17E+01	1,09E+01	1,50E+01
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	<i>MJ</i>	1,95E+01	1,27E+01	3,23E-01	6,49E+00
Use of renewable primary energy resources used as raw materials	<i>MJ</i>	0,00E+00	6,28E+00	0,00E+00	-6,28E+00
Total use renew. primary energy res.	<i>MJ</i>	1,95E+01	1,90E+01	3,23E-01	2,09E-01
Use of secondary material	<i>kg</i>	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels	<i>MJ</i>	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Impact category	Unit	Total	Upstream	Core	Downstream
Use of non-renewable secondary fuels	<i>MJ</i>	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Net use of fresh water	<i>m3</i>	6,26E-02	5,70E-02	3,22E-03	2,38E-03
Hazardous waste disposed	<i>kg</i>	1,90E-04	1,36E-04	1,73E-05	3,74E-05
Non-hazardous waste disposed	<i>kg</i>	2,33E+00	8,00E-01	1,35E-01	1,40E+00
Radioactive waste disposed	<i>kg</i>	3,55E-04	2,28E-04	2,71E-05	1,00E-04
Components for re-use	<i>kg</i>	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	<i>kg</i>	2,05E+00	2,00E-02	6,86E-02	1,96E+00
Materials for energy recovery	<i>kg</i>	1,53E+00	0,00E+00	1,84E-02	1,52E+00
Exported energy, electricity	<i>MJ</i>	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	<i>MJ</i>	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 2 - Bell Chair environmental impact indicators required by PCR 2009:02 v3.0 [5].

Information on the company and certification

MAGIS CONTACT INFORMATION

The LCA and this EPD were carried out by Magis in collaboration with 2B Srl (www.to-be.it). The company references are:

Magis SpA

Via Triestina, Accesso E - Z.I. Ponte Tezze 30020 Torre di Mosto - Ve / Italia

web-site: <https://www.magisdesign.com/it/>

CERTIFICATION AND CERTIFICATION BODY INFORMATION

Registration N°: S-P-03320

Publication date: 2021-03-15

Validity date: 2026-03-14

Revision date: 2023-07-17

Reference year: 2022

Geographical area: Global

EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden, info@environdec.com

PCR 2009:02, version 3.0 (UN CPC 3811, Seats), PCR review was conducted by: Leo Breedveld, 2B Srl, available on the website of the International EPD Consortium (IEC): www.environdec.com

Quality audit for the declaration and the information in compliance with 14025:2006

☒ EPD product certification ☐ EPD verification

Third party verifier: DNV Business Assurance Italia

Accredited by: Accredia

Procedure for follow-up of data during EPD validity involves third party verifier:

☒ Yes ☐ No

The owner of the EPD has sole ownership, liability and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable.

ADDITIONAL INFORMATION

This EPD certification is developed within the EPD® International System program. This document is available on the website of the Swedish Environmental Management Council (www.environdec.com).

EPDs belonging to the same product category may not be comparable. The comparison of the EPDs must always take place with due caution, particular attention must be paid to the boundaries of the systems and the sources of the data used.

DIFFERENCES COMPARED TO PREVIOUS VERSIONS

Compared to the previous EPD versions, the ecoinvent and SimaPro database versions have been updated to version 3.8 and 9.4 respectively. The republication of this EPD concerns the correction of the weight of the final packaging to the declared unit and the addition of the new x4 and x16 formats. Furthermore, as regards the RE-LIFE polypropylene treatment process, compared to the previously published EPD, the inputs for the polypropylene material are not considered for the cut-off approach as it is a pre-consumer type of regenerated material and some primary data concerning the energy consumption for the production of RE-LIFE have been added.

References

- [1] Magis. (<https://www.magisdesign.com/>)
- [2] Magis, 2B Srl, Project Bell Chair, 2023
- [3] ISO (2021). ISO series on Life Cycle Assessment, UNI EN ISO 14040:2021 (www.iso.org).
- [4] ISO (2021). ISO series on Life Cycle Assessment, UNI EN ISO 14044:2021 (www.iso.org).
- [5] PCR 2009:02 v3.0 “Seats”. Product Category Rules (PCR) for preparing an environmental product declaration (EPD) for seats, the Swedish Environmental Management Council (www.environdec.com).
- [6] ecoinvent, 2021: Database ecoinvent version 3.8. “Swiss Centre for Life Cycle Assessment”, ecoinvent database provider (www.ecoinvent.ch).
- [7] PRé, 2021: Software LCA SimaPro 9.4 PRé Consultants, Netherlands (www.pre.nl).
- [8] Google Maps (<https://www.google.it/maps/preview>).
- [9] SeaRates (<https://www.searates.com/it/>).
- [10] Eurostat Database, (<https://ec.europa.eu/eurostat/en/>) consulted in december 2022.
- [11] OECD, 2018. Environment at a Glance 2018 – OECD indicators. OECD.
- [12] IEC, 2019. International EPD Cooperation (IEC), General Programme Instructions for Environmental Product Declaration EPD, Version 3.01, dated 2019-09-18. Swedish Environmental Management Council (www.environdec.com).