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ENVIRONMENTAL PRODUCT DECLARATION

BABAR

EPD Program: International EPD System (www.environdec.com)
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EPD®
THE INTERNATIONAL EPD® SYSTEM

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CONTENTS

THE COMPANY AND THE PRODUCT

Arper's ecodesign programme aims at the reduction of its products' environmental impact, improve technical performances and fulfill its engagement towards the environment. Arper already obtained for some of its products the EPD certification and continues working on EPD certifications for the most representative collections of Arper.

ARPER

Arper manufactures chairs, tables and furnishing accessories. Arper's approach is relationship oriented, and it translates into a design aimed at aesthetics and usability; from a global, innovative and personalized perspective; in the valorisation of local contexts within the internationalization strategies; in organizational policies always based on transparency and the preservation of a solid and coherent brand identity.

Arper values the importance of environmental sustainability and it is characterized by an increasing commitment in this area: in 2006, ISO 14001 environmental management system was adopted, in 2007, the use of the LCA tool was introduced. Through LCA Arper obtained the EPD (Environmental Product Declaration), an ecolabel that requires the implementation of an LCA study and compliance with a set of pre established requirements, defined by product category (Product Category Rules). Arper obtained the first EPD certifications for Catifa 46 and Catifa 53 in 2008. In 2018 Arper obtained the EPD process certification.

PRODUCT DESCRIPTION

Babar is an indoor stool in plastic with a seat in soft integral polyurethane, regulating with seat height between 63.5 and 76.5 cm. The structure is in stainless steel with a satin or chrome finish. The ABS seat insert is available in four colours.

This declaration summarises the results for the white stool whit chrome finish structure. This version is representative for the other models, since its environmental impact is the most similar to the average environmental impact of the 4 stools. Representativeness of the data was verified through sensitivity analysis, where the difference between the values of the indicators of the different Babar stools does not exceed 10%.

Table 1 lists the materials declaration of Babar and its packaging.

TABLE 1: MATERIALS OF WHITE BABAR WITH CHROME FINISH

WHITE BABAR WITH CHROME FINISH			
	Materials	kg	%
Babar, white, chrome	Steel	9,213	80,9%
	ABS	1,384	12,2%
	PUR	0,462	4,1%
	PP / glass fiber	0,102	0,9%
	Master	0,082	0,7%
	Felt	0,048	0,4%
	POM	0,044	0,4%
	Paint	0,042	0,4%
	PVC	0,006	0,0%
	Rubber	0,004	0,0%
	Total	11,39	100%
Packaging x 1	Paper	2,520	76,3%
	Cardboard	0,496	15,0%
	Steel	0,256	7,7%
	PE	0,030	0,9%
	Total	3,31	100%

ENVIRONMENTAL INFORMATION

FUNCTIONAL UNIT

The functional unit is represented by 1 stool with a lifetime of 15 years.

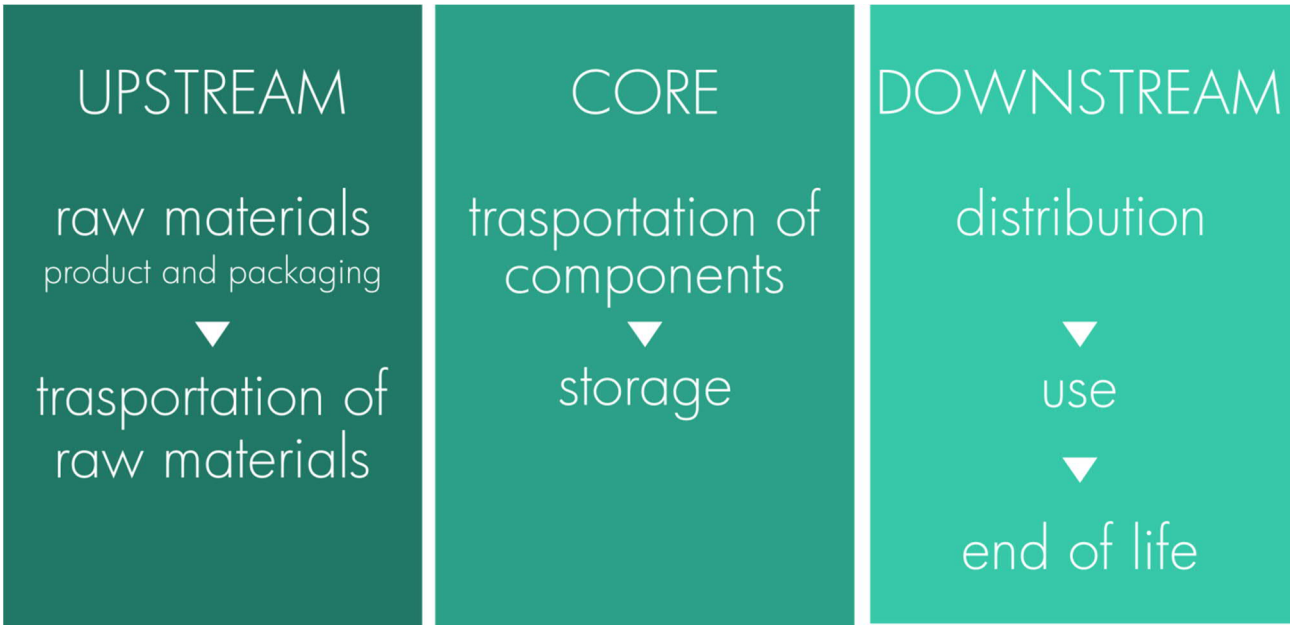
SYSTEM BOUNDARIES

The system boundaries include production of raw materials, production of components and packaging materials, assembly, transport of raw materials and components, storage, distribution, use phase and end of life of the product and its packaging.

Specifically, upstream processes consist of raw materials, their transport, production of the stool components, assembly and packaging.

Core processes include transport to the storage warehouse and consumption of electricity and water for storage. The production and assembly of the product are not included in the core processes since Arper does not manufacture or assemble its products internally.

Downstream processes include the distribution of the packed product, use phase and end of life stage of both product and packaging.



TIME BOUNDARIES

Primary data originate from Arper and refer to 2018. Secondary data originate from the ecoinvent v3.5 database (allocation, cut-off by classification) published in 2018.

GEOGRAPHICAL BOUNDARIES

Components and packaging materials are produced in Italy, except for the polyoxymetthylene (POM) of the bushing produced in Germany and raw gas mechanism, which is produced in Korea. The product is sold both in Italy and abroad. The distribution and end of life scenarios consider the sales figures of the reference year.

BOUNDARIES IN THE LIFE CYCLE

The following processes are excluded from the LCA: infrastructure, building of site, production of manufacturing equipment and personnel activities. For those LCA processes that already contained infrastructure, such as processes from the ecoinvent database, infrastructure has not been excluded. Data for a minimum of 99 % of total inflows to the core module shall be included. Inflows not included in the LCA shall be documented in the EPD.

CO_2 BIOGENIC EMISSIONS

The carbon neutrality approach is used for atmospheric emissions of CO_2 from materials of biogenic origin. With this approach, it is assumed that all atmospheric CO_2 emissions absorbed during the process will be released into the air during the end-of-life phase. Biogenic carbon emissions and removals are reported in an indicator dedicated.

ALLOCATION RULES

Raw materials and production processes are included for virgin resources. No allocation is made for materials subject to recycling. The recycling process is included for input of recycled resources. Outputs subject to recycling are regarded as inputs to the next life cycle. For the energy and water consumption of the storehouse, volume allocation has been applied.

DATA QUALITY

This LCA study is based on primary data for the fundamental aspects of the study, such as the weight of the packaging components and materials. Primary data have been collected from Arper's suppliers, while generic data originate from the ecoinvent database v3.5.

The LCA calculation has been performed using the LCA software SimaPro 9.

The use of proxy data does not exceed the limit of 10% of the impact of the impact categories (see Annex 1 in the LCA Report). All material inputs of the production process have been considered.

The methodology described in the manual about data collection and EPD process has been used for data collection and LCA calculations.

Some ecoinvent v3.5 processes, like the injection moulding of plastic components have been adapted to the Italian market, to make them more representative. Accordingly, the electricity mix has been changed. Similarly, the German electricity mix was selected for the production of the polyoxymetthylene (POM) of the bushing. Electricity mixes were taken from the ecoinvent database.

For the main components of the stool, primary data relative to the consumption of the different production processes were made available by the supplier. In detail, primary data were made available for the following components: the seat, the structural cone, the base and footrest.

Primary data have been used for product storage, provided by the company responsible for the storage.

For the distribution and disposal of the product, sales data of the year 2018 have been used.

Distribution considers a distance between Arper's headquarters and the capital city of the exporting country. In case of transport by ship, a road transport to cover the distance from Arper's facility to the nearest port, transport by ship to the main port of the destination and a local transport of 100 km by road (truck 16-32 t) have been assumed.

The use phase consists of a consumption of 0,1l of hot water and 0,8 g of soap per chair. For soap, a solution with 5% alkylbenzene sulfonate is considered, while a consumption of 5,58 MJ of thermal energy is assumed to heat water.

For the transport of the product and packaging at the end of its life, a road transport (truck 16-32 t EURO 5) of 100 km is assumed. For the end of life scenario, average national data have been used for the countries in which the product is sold.

IMPACT ASSESSMENT

Table 2 until Table 5 show the environmental indicators of Babar, white with chrome finish.

Environmental indicators consist of 8 impact categories (global warming, ozone layer depletion, acidification, photochemical smog, eutrophication, human toxicity, ecotoxicity and land use), material and energy resources (renewable and non renewable), consumption of water and waste. The categories come from the CML-baseline method (global warming, photochemical smog and eutrophication), CML-non baseline method (acidification), USEtox 1.04 reccomended + interim method (human toxicity and ecotoxicity) and Recipe H/A 2016 method (land use).

The indicators are broken down into upstream, core and downstream processes.

TABLE 2: BABAR WHITE WHIT CHROME FINISH, ENVIRONMENTAL INDICATORS		Units	Total	Upstream	Core	Downstream
Environmental Impact Categories	Global Warming	kg CO_2 eq	57.5	51.9	0.4	5.3
	Carbon dioxide biogenic	kg CO_2	-1.04	-1.55	0.01	0.50
	Acidification	kg SO_2 eq	0.3	0.3	0.0	0.0
	Photochemical oxydation	g C_2H_4 eq	23.2	22.6	0.1	0.5
	Eutrophication	kg PO_4^{3-}	0.2	0.2	0.0	0.0
	Human toxicity	CTUh 10^{-5}	12.8	12.7	0.0	0.2
	Ecotoxicity	CTUe 10^{3}	3.1	2.4	0.0	0.8
	Land use	species.yr 10^{-8}	4.6	4.4	0.0	0.1
Use of resources	Non-renewable resurces, materials	kg	30.6	26.6	0.3	3.8
	Non-renewable resurces, energy	kg	25.2	23.9	0.1	1.2
	Renewable resurces, materials	t	426	422	1	2
	Renewable resurces, energy	MJ	136	135	0	1
	Secondary resurces, materials	kg	-	-	-	-
	Secondary resurces, energy	kg	-	-	-	-
	Recovered energy	MJ	-	-	-	-
	Total amount of water *	m^3	426	422	1	2
	Direct amount of water used by the core process	l	376	0	376	0
Wastes	Hazardous wastes	kg	0.842	0.251	0.000	0.590
	Non-hazardous wastes	kg	-	-	-	-
	Materials subject to recycling	kg	0.005	0.005	0.000	0.000

* the total amount of water includes all direct and indirect consumptions of blue water in the system studied. Cooling water is omitted in this calculation.

TABLE 3: BABAR WHITE WHIT CHROME FINISH,	Units	Total	Upstream	Core	Downstream

MATERIAL AND ENERGY RESOURCES						
	Non-renewable resources, materials	kg	30.6	26.6	0.3	3.8
	Gravel	kg	14.0	10.2	0.2	3.6
	Iron	kg	8.9	8.9	0.0	0.0
	Calcite	kg	4.1	4.0	0.0	0.1
	Sodium chloride	kg	1.1	1.1	0.0	0.0
	Other	kg	2.5	2.4	0.0	0.0
	Non-renewable resources, energy	kg	25.2	23.9	0.1	1.2
	Coal, hard	kg	6.0	5.0	0.1	0.8
	Oil, crude	kg	4.7	4.5	0.0	0.2
	Gas, natural / m3	kg	0.1	0.1	0.0	0.0
	Coal, brown	kg	11.3	11.1	0.0	0.1
	Other	kg	3.2	3.2	0.0	0.0
Use of resources	Renewable resources, materials	t	426	422	1	2
	Water, RoW	t	281	280	0	1
	Water, CN	t	25	24	0	1
	Water, IT	t	23	22	1	0
	Water, FR	t	15	15	0	0
	Water, SE	t	11	11	0	0
	Water, CH	t	10	9	0	0
	Water, AT	t	8	8	0	0
	Other	t	54	53	0	1
	Renewable resources, energy	MJ	136	135	0	1
	Energy, gross calorific value, in biomass	MJ	81	80	0	0
	Energy, potential, hydropower	MJ	47	46	0	0
	Energy, kinetic	MJ	6	6	0	0
	Other	MJ	2	2	0	0

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TABLE 4: BABAR WHITE WHIT SATIN FINISH, ENVIRONMENTAL INDICATORS		Units	Total	Upstream	Core	Downstream
Environmental Impact Categories	Global Warming	kg CO_2 eq	57.2	51.5	0.4	5.3
	Carbon dioxide biogenic	kg CO_2	-1,03	-1,54	0,01	0,50
	Acidification	kg SO_2 eq	0.3	0.3	0.0	0.0
	Photochemical oxydation	g C_2H_4 eq	23.1	22.5	0.1	0.5
	Eutrophication	kg PO_4^{3-}	0.2	0.2	0.0	0.0
	Human toxicity	CTUh 10^{-5}	12.7	12.5	0.0	0.2
	Ecotoxicity	CTUe 10^{3}	3.1	2.3	0.0	0.8
	Land use	species.yr 10^{-8}	4.6	4.4	0.0	0.1
Use of resources	Non-renewable resurces, materials	kg	30.5	26.5	0.3	3.8
	Non-renewable resurces, energy	kg	25.0	23.7	0.1	1.2
	Renewable resurces, materials	t	401	397	1	2
	Renewable resurces, energy	MJ	134	133	0	1
	Secondary resurces, materials	kg	-	-	-	-
	Secondary resurces, energy	kg	-	-	-	-
	Recovered energy	MJ	-	-	-	-
	Total amount of water *	m^3	401	397	1	2
	Direct amount of water used by the core process	l	376	0	376	0
Wastes	Hazardous wastes	kg	0.840	0.249	0.000	0.590
	Non-hazardous wastes	kg	-	-	-	-
	Materials subject to recycling	kg	0.005	0.005	0.000	0.000

* the total amount of water includes all direct and indirect consumptions of blue water in the system studied. Cooling water is omitted in this calculation.

TABLE 5: BABAR WHITE WHIT SATIN FINISH, MATERIAL AND ENERGY RESOURCES		Units	Total	Upstream	Core	Downstream
	Non-renewable resources, materials	kg	30.5	26.5	0.3	3.8
	Gravel	kg	14.0	10.1	0.2	3.6
	Iron	kg	8.9	8.9	0.0	0.0
	Calcite	kg	4.1	4.0	0.0	0.1
	Sodium chloride	kg	1.1	1.1	0.0	0.0
	Other	kg	2.4	2.4	0.0	0.0
	Non-renewable resources, energy	kg	25.0	23.7	0.1	1.2
	Coal, hard	kg	11.2	11.1	0.0	0.1
	Oil, crude	kg	6.0	5.0	0.1	0.8
	Gas, natural / m3	kg	4.6	4.5	0.0	0.2
	Coal, brown	kg	3.1	3.1	0.0	0.0
	Other	kg	0.1	0.1	0.0	0.0
Use of resources	Renewable resources, materials	t	401	397	1	2
	Water, RoW	t	256	256	0	1
	Water, CN	t	24	24	0	1
	Water, IT	t	24	24	1	0
	Water, FR	t	15	15	0	0
	Water, SE	t	11	10	0	0
	Water, CH	t	10	10	0	0
	Water, AT	t	8	8	0	0
	Other	t	52	51	0	1
	Renewable resources, energy	MJ	134	133	0	1
	Energy, gross calorific value, in biomass	MJ	81	80	0	0
	Energy, potential, hydropower	MJ	45	44	0	0
	Energy, kinetic	MJ	6	6	0	0
	Other	MJ	2	2	0	0

ADDITIONAL ENVIRONMENTAL INFORMATION

Babar is GREENGUARD certified: certification number: 5714-420, licensee since: 4 November 2008, license expiry date: 4 November 2019.

CONTACT AND OTHER INFORMATION

ARPER CONTACT INFORMATION

The LCA and EPD have been produced by Arper in collaboration with 2B Srl (www.to-be.it). The company references are:

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

■ EPD process certification □ EPD verification

Third party verifier: CSQA Certificazioni Srl, Via San Gaetano n. 74, 36016 Thiene (VI)

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Accredited by: Accredia (004H)

OTHER INFORMATION

This Environmental Product Declaration is developed under the EPD® International System. 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. Comparisons between EPDs shall be done carefully, special attention shall be given to system boundaries and data sources.

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