ENVIRONMENTAL PRODUCT DECLARATION

CATIFA 46

EPD Program: International EPD System (www.environdec.com)
Programme operator: EPD International AB
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Reference standard: ISO 14025
Reference PCR: PCR 2009:02 v3.0 "Seats" CPC Code: 3811
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THE COMPANY AND THE PRODUCT

Arper is working on the assessment of the environmental impact of some of its products, to encourage the research aimed at both the improvement of its technical and environmental performances and to realize its commitment to the respect of the environment. Arper has already obtained an EPD certification for several of its products and aims at obtaining it for all the most representative models of its production.

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 valorization 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 it adopted the ISO 14001 environmental management system, in 2007 it introduced the use of the LCA tool, obtaining several product certifications that highlight the different aspects of the achieved results. 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).

PRODUCT DESCRIPTION

Suitable for both indoor or outdoor spaces, Catifa 46 is available in a wide range of materials, colors and finishes of the shell and trunk. The shell is made of curved plywood, one or two colors polypropylene, with either soft, hard leather or fabric covering and various upholstered finishes. The frame is available in chromed steel, satin stainless steel, aluminum, powder-coated aluminum, wood and it is available in different versions: four legs, sled and trestle.

This declaration describes Catifa 46 with propylene shell and a 4-leg or trestle structure. The 4-leg frame is available with a painted or chromed steel finish, the one with trestle structures one comes with a painted or aluminum finish.

This EPD summarizes the indicators related to the environmental impact of Catifa 46 with a white body, which can also be considered representative for versions featuring a body in different colors (black, sepia, anthracite, ivory, yellow, red, pink, petrol green, green). In fact, it has been ascertained that the differences between the masters account for less than 10% on the overall impact of Catifa, as contemplated by the PCR adopted.

Figure 1 and Figure 2 show the exploded views of the Catifa 46 chair with the 4 legs and trestle base, while Table 1 and Table 2 summarize the materials of the chairs and of the packaging. Either the single chair can be individually packed, or 4 pieces together.

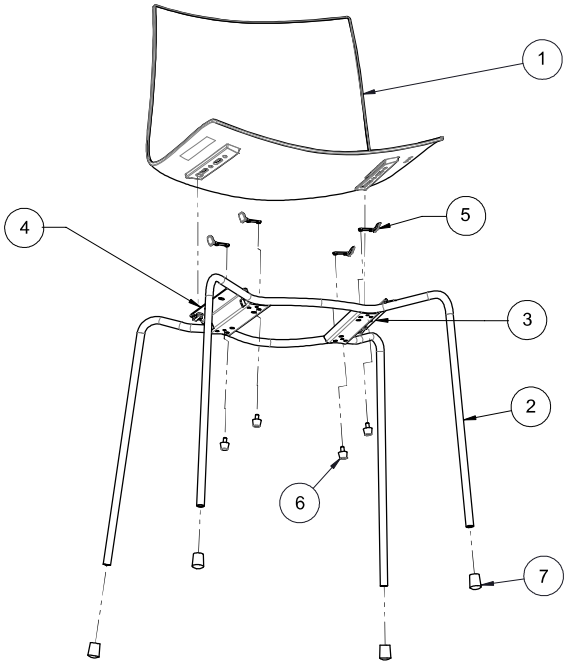

Figure 1 Exploded view of Catifa 46 chair with 4-legs base. PP shell; 2) 4-Legs base; 3) Trays; 4) "Clip It Easy"; 5) Hole cover; 6) Leg cap.

		Catifa 46 4-legs base. chromed		Catifa 46 4-legs base. painted	
	Materials	kg	%	kg	%
Catifa 46	Steel with surface treatment	2,388	48%	2,429	50%
	PP	1,560	32%	1,560	31%
	PP + talc	0,962	20%	0,962	19%
	PE	0,011	0%	0,011	0%
	TPU	0,003	0%	0,003	0%
	Total	4,924	100%	4,965	100%
Packaging x 1	Cardboard	2,440	96%	2,440	95%
	PE	0,067	3%	0,088	3%
	Paper	0,032	1%	0,032	1%
	Galvanized steel	0,014	0%	0,014	1%
	Total	2,553	100%	2,574	100%
Packaging x 4	Cardboard	4,330	93%	4,330	92%
	PE	0,265	6%	0,349	7%
	Paper	0,032	1%	0,032	1%
	Galvanized steel	0,014	0%	0,014	0%
	Total	4,641	100%	4,725	100%

Table 1: Materials in Catifa 46, 4-legs base

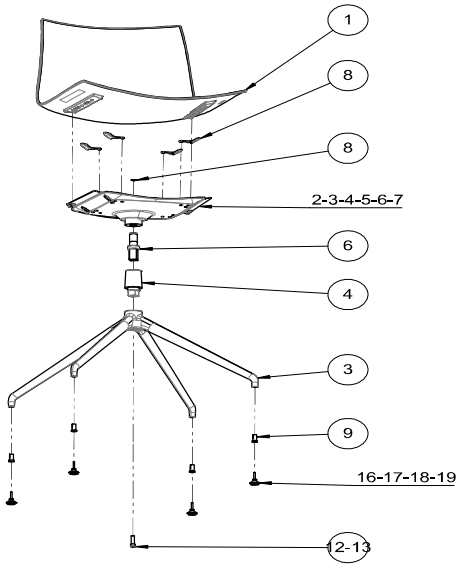

Figure 2 Exploded view of Catifa 46 chair with trestle base.

1) PP shell; 2-7) Under-shell plate; 8) Seeger; 9) Leg pin; 10) Conical adapter; 11) 4-ways base; 12-13) Screw, Washer; 14) Hole cover; 15) Leg cap expander; 16-19) Leg cap.

		Catifa 46 trestle, aluminum		Catifa 46 trestle, painted	
	Materiali	kg	%	kg	%
Catifa 46	Steel	2,626	35%	2,652	36%
	Aluminum	2,400	32%	2,400	32%
	PP	1,560	20%	1,572	21%
	PP + 5 % Talc	0,962	13%	0,962	11%
	GEB015 (low-alloy steel)	0,029	0%	0,029	0%
	PE	0,010	0%	-	-
	Total	7,587	100%	7,615	100%
Packaging x 1	Cardboard	3,157	96%	3,157	88%
	PE	0,083	3%	0,383	11%
	Paper	0,032	1%	0,032	1%
	Steel	0,022	0%	0,022	0%
	Total	3,294	100%	3,594	100%
Packaging x 4	Cardboard	4,511	74%	4,511	74%
	PE	1,517	25%	1,517	25%
	Paper	0,032	1%	0,032	1%
	Steel	0,022	0%	0,022	0%
	Total	6,082	100%	6,082	100%

Table 2: Materials in the Catifa 46 chairs with trestle base.

ENVIRONMENTAL IMPACT DECLARATION

DECLARED UNIT

The declared unit considered is 1 seat with a duration of 15 years. Product life time corresponds to the time the seat maintains its function: in absence of statistical data, life time is assumed equal to the default value of 15 years.

SYSTEM BOUNDARIES

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

Specifically, upstream processes include raw materials, their transport, the production of the chair components, the assembly of the structure of the legs and of the body and the packaging of the body and of the structure.

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

The downstream processes include the distribution of the packaged product, the use phase and the end of life of the packaging and of the product.

No cut-off rules were applied.

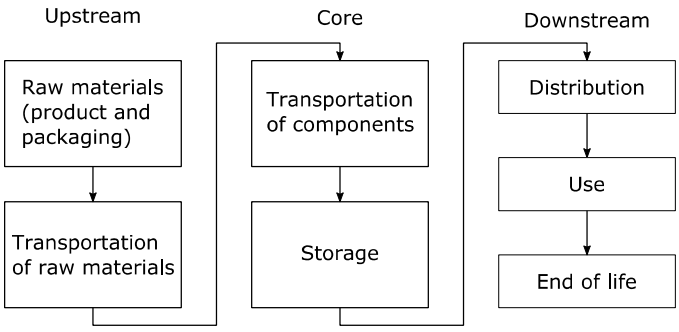

Figure 1: System Boundaries of the LCA of Catifa 46 chair

TIME BOUNDARIES

Primary data come from Arper and are referred to the year 2020. Secondary data come from the Ecoinvent v 3.7 database, allocation and cut-off by classification, published in 2021.

TERRITORIAL BOUNDARIES

Components and packaging materials are produced in Italy, with the exception of the 4-ways base of the trestle, which is produced in Vietnam. The product is marketed both in Italy and abroad. The distribution and end-of-life scenario consider the sales of the reference year.

BOUNDARIES IN THE LIFE CYCLE

The construction of the company's buildings and infrastructure, the production of work equipment, other capital assets and personnel activities are not included in the LCA. For processes comprising the infrastructure, such as the processes deriving from the ecoinvent database, the infrastructure has not been omitted.

ALLOCATION RULES

As regards end-of-life allocation, the "cut-off" approach was adopted. 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 consumptions of the storage warehouse 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 were collected from Arper's suppliers. For secondary data, the ecoinvent v3.7 database was used. Some ecoinvent v3.7 processes, such as powder coating, welding, extrusion of steel bars and injection molding of plastic parts, have been adapted to the Italian situation (or Vietnamese in the case of the spokes of the trestle base) changing the energy mix in order to make them more representative of the system studied.

The LCA calculation was performed using the SimaPro 9.2 software.

The use of proxy data does not exceed the limit of 10% of the overall impact of the main impact categories, as contemplated by the reference PCRs. All the material inputs of the production process have been considered.

For data collection and LCA calculations, the methodology described in the manual for data collection and the EPD processing process was used.

For the main components of the chair, primary data about consumption of production processes were obtained from the supplier. The components for which primary data have been made available are: the polypropylene shell; for the 4 leg version: the legs, the trays, the clips, the feet and the stacking caps, data on chromium-plating and painting processes; for the trestle version, data about the clips.

For the energy consumption of the main components of the seat, national residual electricity mix was used by adapting the processes related to the italian national mix available in ecoinvent database. The Vietnamese energy mix was used for the production of the trestle 4-ways base "Electricity, medium voltage {VN} | market for electricity, medium voltage | Cut-off, S".

For the packaging methods of Catifa 46, the information from the sales data in the year 2020 was used: 86% of the Catifa 46 4 legs and 84% of the Catifa 46 trestle are packed in a 4-piece box packaging.

For the product storage primary data were used, provided by the company responsible for the storage of shells and packed structures.

In the distribution phase, sales data were used, considering a road transport (ecoinvent database process: Transport, freight, lorry 16-32 metric ton, EURO4 {RER}) and the distance between Arper's headquarters and the capital city of the exporting country. In the case of transport by ship, land transport (truck 16-32 t EURO4) is assumed to cover the distance from the port to the nearest Arper's facility and then transport by ship to the main port of the assessed foreign country.

In addition, a local transport of 300 km by road (truck 16-32 t EURO4) is evaluated.

In the use phase, a consumption of 0.1 l of hot water and 0.8 g of chair soap is assumed. For soap, a solution with 5% Alkylbenzene sulfonate is considered. To heat the water, a consumption of 5.58 MJ of thermal energy is assumed.

For the transport of the product and packaging at the end of its life, a road transport (truck 16-32 t EURO 4) for 100 km is assumed. For the end-of-life scenario, average national data (Rapporto Rifiuti Urbani 2020 ISPRA, OECD and Eurostat data) were used for the countries in which the product is sold.

ENVIRONMENTAL IMPACT INDICATORS

The following tables show the environmental impact indicators for the life cycle of 1 Catifa 46 chair with 4-leg base, chrome-plated and painted versions and trestle, aluminum and painted versions.

Environmental indicators consist of 10 impact categories (global warming total/fossil/biogenic/land use, acidification, photochemical oxidant formation potential, eutrophication, abiotic depletion, abiotic depletion for fossil fuels and water scarcity), material and energy resources (renewable and non renewable), human toxicity, ecotoxicity and land use, consumption of water and waste. The indicators are divided into the contribution of the upstream, core and downstream phases.

TABLE 3: CATIFA 46, 4 LEGS, CHROMED FINISH, ENVIRONMENTAL INDICATORS					
Impact category	Units	Total	Upstream	Core	Downstream
Global warming (GWP100a)_total	kg CO_2 eq	22.89	19.01	0.10	3.78
Global warming (GWP100a)_fossil	kg CO_2 eq	22.21	18.74	0.10	3.37
Global warming (GWP100a)_ biogenic	kg CO_2 eq	0.648	0.237	0.001	0.409
Global warming (GWP100a)_land use	kg CO_2 eq	3.2E-02	3.1E-02	2.29E-05	5.50E-04
Acidification Potential	kg SO_2 eq	7.7E-02	6.9E-02	3.75E-04	7.61E-03
Eutrophication potential	kg PO_4^{3-}	3.12E-02	2.83E-02	8.07E-05	2.78E-03
Photochemical oxidant formation potential	kg NMVOC eq	6.8E-02	5.8E-02	4.00E-04	8.9E-03
Abiotic depletion	kg Sb eq	1.54E-04	1.48E-04	2.83E-07	6.01E-06
Abiotic depletion (fossil fuels)	MJ	366	338	1.46	26.5
Water scarcity	m^3 eq	11.7	9.6	0.018	2.04
Renewable resources, energy	MJ	5.42	4.99	0.05	0.38
Renewable resources, materials	MJ	22.0	22.0	-	-
Renewable resources, total	MJ	27.46	27.03	0.048	0.38
Non renewable resources, energy	MJ	298.5	269.5	1.5	27.2
Non renewable resources, materials	MJ	112.5	112.5	-	-
Non renewable resources, total	MJ	411	382	1.54	27.2
Water use	m^3	2.98E-01	2.47E-01	4.94E-04	5.13E-02
Hazardous waste	kg	9.38E-02	5.94E-02	6.53E-05	3.44E-02
Non hazardous waste	kg	6.27	4.02	0.045	2.21
Radioactive waste	kg	-	-	-	-
Human toxicity, cancer	cases	4.52E-05	4.51E-05	5.96E-09	1.45E-07
Human toxicity, non-cancer	cases	3.93E-06	3.56E-06	1.01E-08	3.60E-07
Freshwater ecotoxicity	PAF.m^3.day	230133	208907	308	20918
Land use	species.yr	8.04E-09	7.47E-09	2.55E-11	5.44E-10

Table 3: Results of the characterization of the Catifa 46 chair, 4 legs, chromed finish.

TABLE 4: CATIFA 46, 4 LEGS, PAINTED, ENVIRONMENTAL INDICATORS					
Impact category	Units	Total	Upstream	Core	Downstream
Global warming (GWP100a)_total	kg CO_2 eq	25.5	21.5	0.10	3.82
Global warming (GWP100a)_fossil	kg CO_2 eq	24.8	21.2	0.10	3.41
Global warming (GWP100a)_ biogenic	kg CO_2 eq	0.679	0.269	0.001	0.409
Global warming (GWP100a)_land use	kg CO_2 eq	3.61E-02	3.55E-02	2.30E-05	5.54E-04
Acidification Potential	kg SO_2 eq	0.1159	0.1079	0.0004	0.0077
Eutrophication potential	kg PO_4^{3-}	3.48E-02	3.19E-02	8.10E-05	2.81E-03
Photochemical oxidant formation potential	kg NMVOC eq	0.0747	0.0652	0.0004	0.009
Abiotic depletion	kg Sb eq	1.40E-04	1.33E-04	2.84E-07	6.05E-06
Abiotic depletion (fossil fuels)	MJ	404	376	1.47	26.7
Water scarcity	m^3 eq	12.8	10.7	0.02	2.04
Renewable resources, energy	MJ	7.66	7.26	0.048	0.38
Renewable resources, materials	MJ	22.0	22.0	-	-
Renewable resources, total	MJ	29.7	29.3	0.048	0.38
Non renewable resources, energy	MJ	340.7	311.7	1.55	27.3
Non renewable resources, materials	MJ	113.3	113.3	-	-
Non renewable resources, total	MJ	454	425	1.55	27.3
Water use	m^3	3.33E-01	2.82E-01	4.94E-04	5.13E-02
Hazardous waste	kg	9.96E-02	6.46E-02	6.57E-05	3.49E-02
Non hazardous waste	kg	6.61	4.34	0.045	2.23
Radioactive waste	kg	-	-	-	-
Human toxicity, cancer	cases	3.31E-05	3.30E-05	5.99E-09	1.46E-07
Human toxicity, non-cancer	cases	4.26E-06	3.88E-06	1.02E-08	3.65E-07
Freshwater ecotoxicity	PAF.m^3.day	232075	210624	309	21141
Land use	species.yr	8.38E-09	7.81E-09	2.57E-11	5.49E-10

Table 4: Results of the characterization of the Catifa 46 4 legs, painted.

TABLE 5: CATIFA 46, TRESTLE, ALUMINIUM, ENVIRONMENTAL INDICATORS					
Impact category	Units	Total	Upstream	Core	Downstream
Global warming (GWP100a)_total	kg CO_2 eq	43.5	38.5	0.134	4.85
Global warming (GWP100a)_fossil	kg CO_2 eq	42.5	38.3	0.132	4.11
Global warming (GWP100a)_ biogenic	kg CO_2 eq	0.907	0.168	0.002	0.738
Global warming (GWP100a)_land use	kg CO_2 eq	6.2E-02	6.1E-02	3.06E-05	8.06E-04
Acidification Potential	kg SO_2 eq	2.21E-01	2.08E-01	4.96E-04	1.21E-02
Eutrophication potential	kg PO_4^{3-}	6.23E-02	5.73E-02	1.06E-04	4.98E-03
Photochemical oxidant formation potential	kg NMVOC eq	1.44E-01	1.29E-01	5.33E-04	1.39E-02
Abiotic depletion	kg Sb eq	3.49E-04	3.41E-04	3.76E-07	8.46E-06
Abiotic depletion (fossil fuels)	MJ	598	559	1.92	37.05
Water scarcity	m^3 eq	15.6	13.4	0.02	2.13
Renewable resources, energy	MJ	29.4	28.8	0.06	0.5
Renewable resources, materials	MJ	25.3	25.3	-	-
Renewable resources, total	MJ	54.7	54.1	0.06	0.5
Non renewable resources, energy	MJ	528	488	2.03	37.9
Non renewable resources, materials	MJ	125	125	-	-
Non renewable resources, total	MJ	653	613	2.03	37.9
Water use	m^3	0.440	0.385	0.001	0.054
Hazardous waste	kg	6.37E-01	4.13E-01	8.68E-05	2.23E-01
Non hazardous waste	kg	11.3	7.61	0.06	3.63
Radioactive waste	kg	-	-	-	-
Human toxicity, cancer	cases	3.41E-05	3.39E-05	7.91E-09	1.99E-07
Human toxicity, non-cancer	cases	9.22E-06	8.65E-06	1.34E-08	5.52E-07
Freshwater ecotoxicity	PAF.m^3.day	2593469	1155832	406	1437231
Land use	species.yr	1.27E-08	1.18E-08	3.42E-11	8.10E-10

Table 5: Results of the characterization of Catifa 46, trestle, aluminum.

TABLE 6: CATIFA 46, TRESTLE, PAINTED, ENVIRONMENTAL INDICATORS					
Impact category	Units	Total	Upstream	Core	Downstream
Global warming (GWP100a)_total	kg CO_2 eq	44.4	39.3	0.134	4.92
Global warming (GWP100a)_fossil	kg CO_2 eq	43.4	39.1	0.132	4.18
Global warming (GWP100a)_ biogenic	kg CO_2 eq	0.920	0.180	0.002	0.738
Global warming (GWP100a)_land use	kg CO_2 eq	6.26E-02	6.18E-02	3.07E-05	8.10E-04
Acidification Potential	kg SO_2 eq	2.32E-01	2.19E-01	4.97E-04	1.22E-02
Eutrophication potential	kg PO_4^{3-}	6.33E-02	5.81E-02	1.07E-04	5.06E-03
Photochemical oxidant formation potential	kg NMVOC eq	1.46E-01	1.32E-01	5.34E-04	1.39E-02
Abiotic depletion	kg Sb eq	3.56E-04	3.47E-04	3.77E-07	8.50E-06
Abiotic depletion (fossil fuels)	MJ	612	573	1.93	37.2
Water scarcity	m^3 eq	15.9	13.8	0.024	2.13
Renewable resources, energy	MJ	30.3	29.7	0.062	0.54
Renewable resources, materials	MJ	25.3	25.3	-	-
Renewable resources, total	MJ	55.6	55.0	0.062	0.54
Non renewable resources, energy	MJ	540.9	500.9	2.03	38.09
Non renewable resources, materials	MJ	127.1	127.1	-	-
Non renewable resources, total	MJ	668	628	2.03	38.09
Water use	m^3	0.449	0.394	0.001	0.054
Hazardous waste	kg	0.641	0.415	0.000	0.225
Non hazardous waste	kg	11.5	7.74	0.06	3.67
Radioactive waste	kg	-	-	-	-
Human toxicity, cancer	cases	3.43E-05	3.41E-05	7.93E-09	2.01E-07
Human toxicity, non-cancer	cases	9.33E-06	8.75E-06	1.35E-08	5.62E-07
Freshwater ecotoxicity	PAF.m^3.day	2614283	1164518	407	1449358
Land use	species.yr	1.28E-08	1.20E-08	3.43E-11	8.14E-10

Table 6: Results of the characterization of Catifa 46 trestle, painted.

ADDITIONAL ENVIRONMENTAL INFORMATION

Since 2008 "Catifa 46" is GREENGUARD and GREENGUARD GOLD certified, certificate number: 5715-410 and 5715-420.
Catifa 46 with painted base (4-legs and trestle) or aluminum base (trestle) is GECA certified, license number: ARP-2017, Licensee since: 02 July 2009, License expiry date: 07 February 2023.

INFORMATION ABOUT THE COMPANY AND ON THE CERTIFICATION

ARPER – CONTACT INFORMATION

The Life Cycle Assessment Study (LCA) and this Environmental Product Declaration (EPD) were conducted 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)

Phone: 0446-313011, Fax: 0446313070, www.csqa.it.

Accredited by: Accredia (004H)

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

■ Yes □ No

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.

REFERENCES

- 2B Srl, 2021. LCA project Catifa 46 (www.to-be.it).
- Arper Spa, 2B Srl, Manuale descrittivo della procedura EPD Arper v1.3, novembre 2021.
- Arper Spa, 2B Srl, Raccolta dei dati LCA/EPD v1.3, novembre 2021.
- ecoinvent, 2021: Swiss Centre for Life Cycle Assessment, fornitore del database ecoinvent v3.7 (www.ecoinvent.ch).
- Ioelovich, M. et al, 2018. Energy Potential of natural, synthetic polymers and waste materials – review.
- ISO 14025:2006. Environmental labels and declarations, type 3 environmental declarations, principles and procedures (www.iso.org).
- ISO 14040/14044: 2021. ISO series on Life Cycle Assessment (Valutazione del ciclo di vita), UNI EN ISO 14040: 2021e 14044: 2021 (www.iso.org).
- ISPRA, 2020. Rapporto Rifiuti Urbani (www.isprambiente.gov.it).
- Eurostat Database, 2021 (https://ec.europa.eu/eurostat/en/).
- OECD Database, 2021 (www.oecd.org).
- An Econometric Analysis of Global Waste Paper Recovery and Utilization, 2003 (www.researchgate.net).
- PCR 2009:02 v3.0 – Seats. Product Category Rules (PCR) for preparing an environmental product declaration (EPD) for other furniture, the Swedish Environmental Management Council (www.environdec.com).
- PRé Consultants, Olanda. Software SimaPro, versione 9.2 (www.pre-sustainability.nl).
- SEMC, 2015. International EPD Cooperation (IEC), General Programme Instructions for Environmental Product Declaration EPD, Version 3.01, 2019-09-18. Swedish Environmental Management Council (www.environdec.com).