Environmental Product Declaration ISO 14025

epd®norge.no
The Norwegian EPD Foundation

arper Catifa 46, 4-leg

NEPD-nr: 102E

Approved 01.08.2011 in accordance with ISO14025, § 8.1.4.
Valid until: 01.08.2016.

Signature: Susan Fossdal

Verification of data:

Independent verification of LCA data and other environmental information in the declaration is performed by Prof. Annik Magerholm Fet, Global & Local in accordance with ISO 14025, § 8.1.3 and based on the ISO 14001 certification.

Signature: Annik Magerholm Fet

This declaration has been compiled by:
Michela Possagno (Arper) and Leo Breedveld (2B).

PCR:
Product Category Rules (PCR) for seating (NPCR003, 2008).

About the EPD:
EPDs from other program operators than EPD-Norge are not necessarily comparable.

Key performance indicators (cradle to grave)

Global warming:	18,7 kg CO_2 eq.
Energy consumption:	432,9 MJ
Expected lifetime:	15 years

Information about the producer:

Arper SpA
Via Lombardia 16
31050 Monastier (TV), Italy
e-mail: info@arperitalia.it

ISO14001 certified by DNV
Certificate No. 65477-2009.
Obtained on 14-10-2009.

Information about the product:	Catifa 46, in single colour and two-tone PP with 4-leg steel base.
Functional unit:	One seating solution provided and maintained for a period of 15 years.
Included life cycle stages:	From cradle to grave, covering the entire life cycle from raw material extraction, transport, production, distribution, use and maintenance to end-of-life.
Performance year:	2010.
Data development year:	Foreground data: producer and main suppliers (2010). Background data: Ecoinvent v2.2.
Assumed market:	World.
Contact person:	Michela Possagno.

Product specification

Table 1: Product composition

Materials		Mass [kg]	Fraction [%]	Fraction from vendors with certified EMS	Fraction of components with certified EPD	System boundaries (see additional information)
Catifa 46 4-leg	Polypropylene (PP)	2,271	37,7%	100%	0	AEF
	Steel	2,004	33,3%	100%	0	AEF
	Polyurethane (PUR)	0,022	0,4%	0	0	AEF
	Polyethylene (PE)	0,006	0,1%	0	0	AEF
Packaging	Cardboard	1,619	26,9%	0	0	AEF
	Polyethylene (PE)	0,086	1,4%	0	0	AEF
	Steel	0,011	0,2%	0	0	AEF
	Paper	0,005	0,1%	0	0	AEF
Total		**6,024**	**100,0%**	**71,0%**	**0,0%**	**AEF**

Resource consumption

Table 2: Material resource consumption per life cycle stage

Category	Resources	Unit	Upstream				Core	Downstream				Total
			RM	MP	PA	T	P	D	U	DPr	DPa	
Renewable materials	Water	kg	195,39	234,31	68,38	0,95	23,16	2,88	22,69	0,34	0,26	548,36
	Biomass	kg	0,02	0,13	0,66	0,00	0,00	0,00	0,00	0,00	0,00	0,81
Non renewable materials	Natural gas	kg	1,32	0,59	0,39	0,01	0,13	0,01	0,04	0,00	0,00	2,49
	Coal	kg	2,01	1,46	0,31	0,00	0,04	0,01	0,01	0,00	0,00	3,83
	Oil	kg	2,58	0,28	0,24	0,10	0,01	0,31	0,00	0,00	0,00	3,53
	Iron	kg	1,30	0,16	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,45
	Copper	kg	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Salt	kg	0,04	0,06	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,11
	Calcite	kg	0,62	0,11	0,03	0,00	0,00	0,00	0,00	0,00	0,00	0,76
	Clay, sand, gravel	kg	0,49	0,04	0,19	0,00	0,00	0,00	0,00	0,00	0,00	0,72
	Nickel	kg	0,09	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,09
	Chromium	kg	0,08	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,08
	Unspecified	kg	0,08	0,01	0,02	0,00	0,00	0,00	0,00	0,00	0,00	0,12
Total		kg	204,03	237,14	70,23	1,06	23,34	3,21	22,73	0,35	0,26	562,35

NOTE: The abbreviations used in the above table are RM = Raw materials, MP = Material processing, PA = Packaging materials, T = Transport, P = Production, D = Distribution, U = Use, DPr = Disposal product, DPa = Disposal packaging.

Table 3: Energy resource consumption per life cycle stage

Category	Resources	Unit	Upstream				Core	Downstream				Total
			RM	MP	PA	T	P	D	U	DPr	DPa	
Renewable energy	Biomass, Feedstock	MJ	0,81	2,46	13,52	0,00	0,01	0,00	0,40	0,00	0,00	17,20
	Hydro power	MJ	6,94	2,90	1,15	0,01	0,30	0,02	0,01	0,00	0,01	11,34
	Wind power	MJ	0,18	0,35	0,06	0,00	0,01	0,00	0,00	0,00	0,00	0,60
	Solar power	MJ	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01
Non renewable energy	Coal	MJ	58,26	39,88	8,33	0,07	1,10	0,20	0,14	0,01	0,02	108,01
	Oil	MJ	112,96	12,18	10,58	4,44	0,65	13,47	0,04	0,07	0,03	154,41
	Natural gas	MJ	71,78	32,28	21,16	0,28	6,92	0,82	1,97	0,03	0,02	135,24
	Peat	MJ	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Sulphur	MJ	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Hydrogen	MJ	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Nuclear energy	MJ	2,69	2,51	0,83	0,01	0,06	0,02	0,01	0,00	0,01	6,13
Total		MJ	253,60	92,56	55,63	4,80	9,05	14,53	2,57	0,12	0,09	432,94

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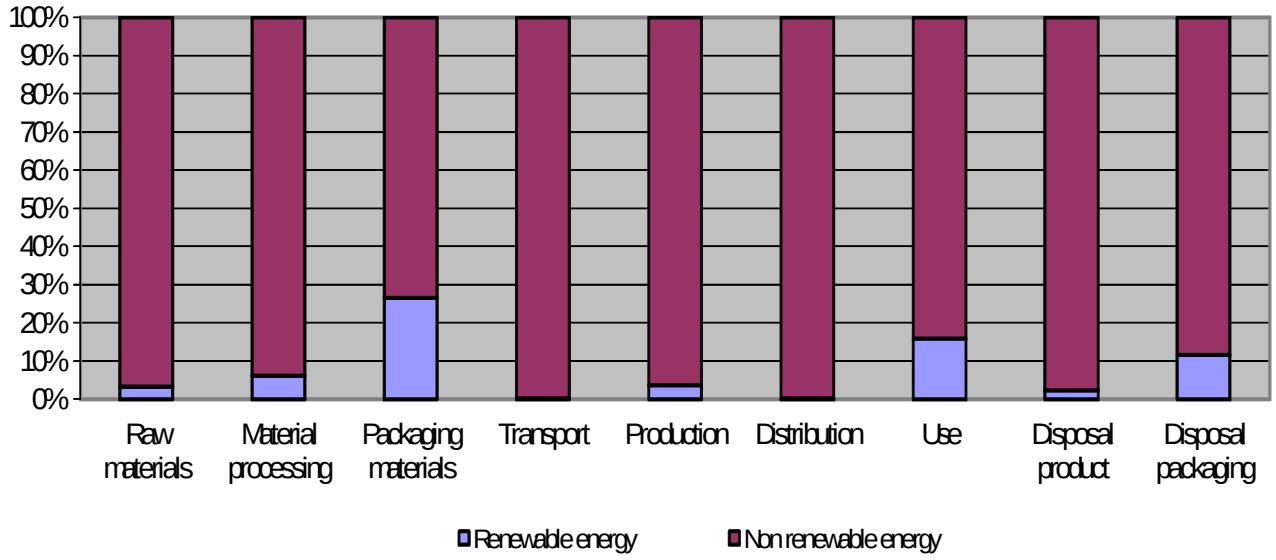

Figure 2: Energy carriers specified by percentage per life cycle stage.

Land use and water resources:
Land use has been calculated according to the LCIA method Ecoindicator 99 resulting in an indicator value of 0,61 PDF m^2yr (Potentially Disappeared Fraction per m^2yr). The main contributors to the land use indicator are packaging materials (79,53%), material processing (10,31%), use (7,32%), raw materials (2,80%) and production (0,06%). Water consumption is described in Table 2.

Output and environmental impacts

Table 4: Environmental impact categories

Environmental impact category	Unit	Upstream				Core	Downstream				Total
		RM	MP	PA	T	P	D	U	DPr	DPa	
Global warming	kg CO_2 eq	8,81	4,69	2,18	0,35	0,51	1,05	0,13	0,49	0,51	18,73
Ozone layer depletion	mg CFC-11 eq	0,22	1,61	0,22	0,05	0,05	0,16	0,02	0,00	0,00	2,33
Acidification	g SO_2 eq	50,75	17,54	6,81	1,70	1,32	7,23	0,17	0,14	0,23	85,87
Eutrophication	g PO_4^{3-} eq	12,06	15,18	3,43	0,39	0,26	1,29	0,06	3,73	1,29	37,71
Photochemical oxidation	g C_2H_4 eq	3,51	0,93	0,39	0,04	0,06	0,19	0,04	0,02	0,16	5,34

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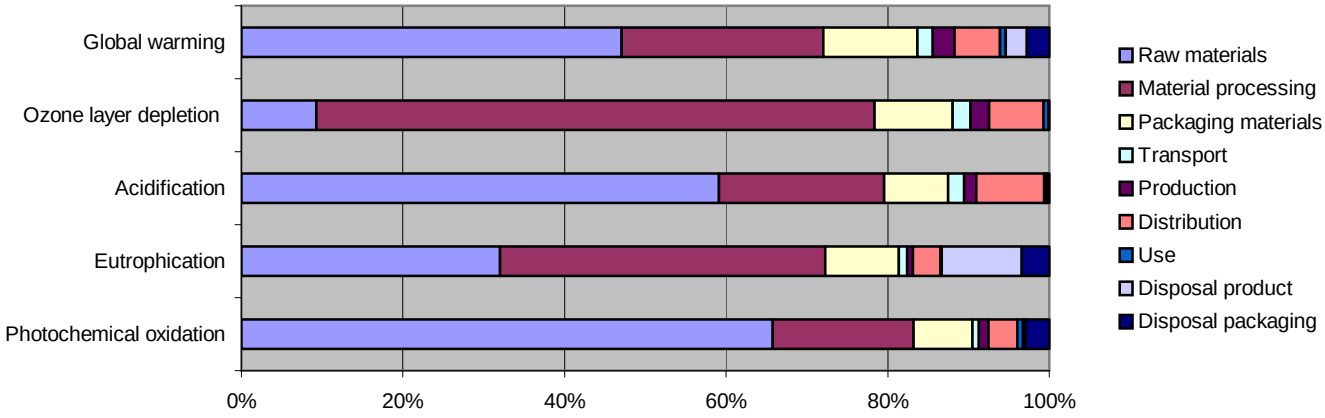

Figure 3: Distribution of environmental impacts per life cycle stage.

Table 5: Largest contributors of waste and emissions

Category	Resources	Unit	Upstream				Core	Downstream				Total
			RM	MP	PA	T	P	D	U	DPr	DPa	
Emissions to air	Carbon dioxide	kg	7,78	4,39	1,97	0,34	0,49	1,02	0,11	0,44	0,00	16,54
	Carbon monoxide	kg	0,06	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,07
	Methane	kg	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Nitrous oxide	kg	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Nitrogen oxides	kg	0,02	0,01	0,00	0,00	0,00	0,01	0,00	0,00	0,00	0,04
	Sulphur oxides	kg	0,03	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,05
	NMVOC	kg	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,02
	Dioxines, air	kg	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Emissions to water	Phosphates	kg	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,02
	Nitrates	kg	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,01
	Dioxines, water	kg	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Waste	Waste to recycling	kg	0,00	0,30	0,00	0,00	0,18	0,00	0,00	2,76	1,11	4,35
	Waste to incineration	kg	0,00	0,00	0,00	0,00	0,01	0,00	0,00	0,26	0,10	0,37
	Waste to landfill	kg	0,00	0,00	0,00	0,00	0,05	0,00	0,00	1,28	0,51	1,84
	Hazardous waste	kg	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

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Additional information

Arper's commitment to environmental protection is part of the company philosophy. Arper's goal is to provide high quality, safe, durable and sustainable products. For this reason, Arper has implemented ISO 14001 (Certificate No. 65477-2009) and the entire seating collection is GREENGUARD certified. Arper's product stewardship programme comprises actions on ecodesign (material and waste minimisation, disassembly of components, recycling of materials), product take-back at the end of life in Australia and environmental communication.

This environmental product declaration has been created according to the PCR for seating. The lifetime of an average piece of furniture is estimated to be 15 years according to the PCR. This is the average lifetime in the possession of the first consumer. The furniture will usually have a longer technical lifetime.

Specific data are used to describe transport, production and use phase, while generic data are used to describe upstream phases (materials and processing) and downstream phases (recycling, disposal). Specific data originate from the producer and two main suppliers (2010), while generic data have been selected from the ecoinvent v2.2 LCA database (2010).

Due to differences in the selected system boundaries and the applied LCA database, one should be careful comparing EPDs of different seating solutions. EPDs with different choices on system boundaries and data are not comparable to other declarations (see PCR seating).

End of life treatment of the product

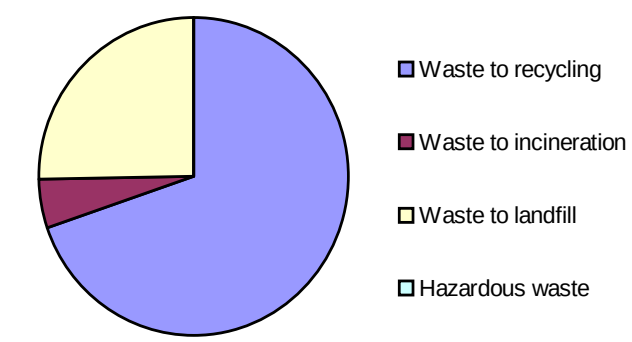

Figure 4: Assumed waste treatment for Catifa 46 with 4-leg steel base.

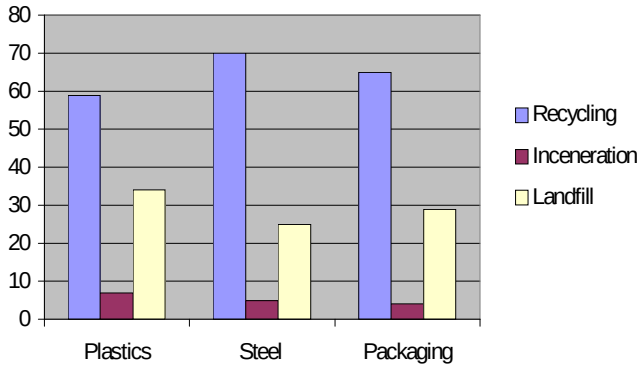

Figure 5: Statistical data of waste management scenarios for different materials.

This analysis is based on Italian statistical data of waste management scenarios for different materials. The average disposal scenario for the different materials is illustrated in figure 5. Figure 4 shows the disposal scenario of the furniture (Catifa 46 with 4-leg steel base). For end of life treatment in other countries, the waste scenario is assumed to be in accordance with the actual system of material treatment in Italy.

Methodological decisions

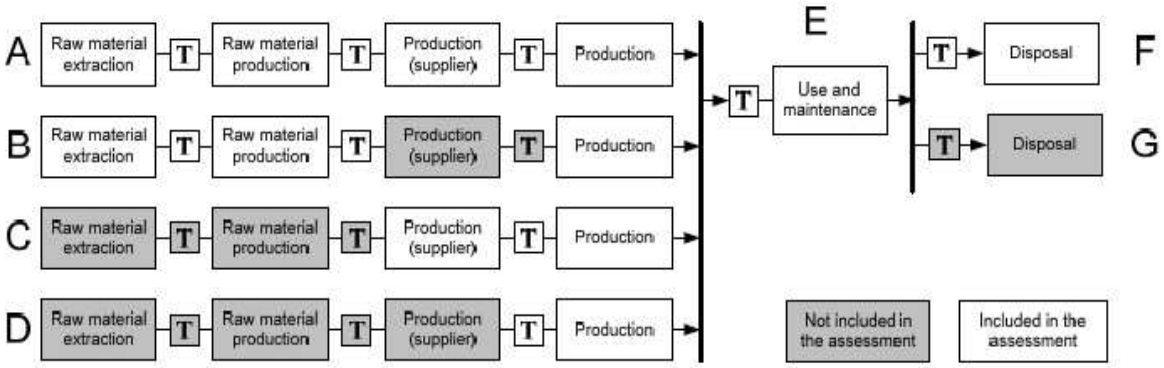

Figure 6: System boundaries. See table 1 for specification of system boundaries for this declaration (AEF).

Cut-off criteria: Processes and activities that contribute to less than 1% of the total environmental impact for any impact category are allowed to be omitted. This cut-off criteria has not been applied. For processes originating from the ecoinvent database, infrastructure has been excluded.

Use phase: The use-phase scenario is illustrated with Italian conditions. The use phase of the seating solution consists of cleaning the chair once a month with a soft cloth and a solution of lukewarm water and neutral soap.

Disposal phase: The disposal phase is based on Italian statistical data (2007). The end of life treatment of the furniture will most likely have less environmental impacts than stated in this environmental declaration since the lifetime of the furniture might be longer than assumed.

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 outputs to the next life cycle. The energy consumption, water use and waste production at the production site (Arper) has been allocated to each single chair by means of mass allocation.

References

ISO 14040:2006. Environmental management, Life cycle assessment, Principles and framework (www.iso.org).

ISO 14044:2006. Environmental management, Life cycle assessment, Requirements and guidelines (www.iso.org).

ISO 14025:2006. Environmental labels and declarations, Type III environmental declarations (www.iso.org).

NPCR003 Product Category Rules for Seating solution (www.epd-norge.no).

NEPD No:101. Arper Catifa 46 4-leg (www.epd-norge.no).

2B, 2008. Internal LCA Catifa 46, 4-leg steel base. Arper SpA, Monastier (www.arper.it).

2B, 2011. Updated internal LCA Catifa 46, 4-leg steel base. Arper SpA, Monastier (www.arper.it).