Environmental Declaration ISO 14025/ISO 21930

epd-norge.no
The Norwegian EPD Foundation

HÅG

HÅG Capisco Puls 8010

Figure 1

Environmental Indicators.	Cradle to gate	Use phase	
Global warming:	31	1	kg CO_2-eq.
Energy consumption:	607	37	MJ
Amount of recycled materials:	48		%
Guarantee period:		10	yr

NEPD nr: 212

Approved according to ISO14025, §8.1.4: 17.06.2011
Valid until: 17.06.2016

Verification of data:
Independent verification of data and other environmental information has been carried out by Senior Research Scientist Hanne Møller in accordance with ISO14025, §8.1.3.

Declaration compiled by:
MSc. Camilla Skjerve-Nielssen and Siv.ing. Kari-Anne Lyng

Østfoldforskning

PCR:
Product Category Rules for Seating solution (The Norwegian EPD Foundation, 2008). PCR approved by the Norwegian EPD Foundation's verification committee. See also "*Methodological Decisions* ".

About EPD:
EPDs from other program operators than the Norwegian EPD Foundation may not be comparable.

Information about the producer:
HÅG asa
Fridtjof Nansens vei 12
Postboks 5055, Majorstuen
N-0301 OSLO, Norway
Org.nr.: NO-928902749
ISO 14001 certified by Dovre Sertifisering (NO-S-0000016).
HÅG's Environmental Management System includes procedures for collection of LCA data and EPD development.

Information about the product:	Office Chair
Functional unit:	Seating solution, produced and maintained for 15 years.
Scope of assessment:	This environmental declaration covers the product's life cycle from raw material extraction until the finished seating solution, incl. use & maintenance. The user phase is represented by a use scenario in Southern Germany. A scenario for disposal is presented.
Year of study:	2011
Data:	Specific data: 2006 to 2008, Specific database data: Late 1990s to 2006. (See Figure 5)
Expected market area:	Europe & U.S.A.
Company contact:	Carl P. Aaser, Tel: + 47 22 59 59 10, e-mail: carl.aaser@sbseating.com

Product Specification

Table 1

	Mass kg/seating solution	Share %	% included in the analysis	% from suppliers with a certified Environmental Management System*	% of components with EPD*	System boundaries (see the last page for more information)	Hazardous content
Steel	*3,9*	*27 %*				A-G	The sitting solution meets the following minimum emissions requirements in the Greenguards certification: Formaldehyde: < 0.025 ppm (< 0.03 mg/m³) (Greenguard certificate). It has not been possible to obtain data on the content of brominated flame retardents & heavy metals. These chemicals have not been
Aluminium	*2,9*	*21 %*				A-G	
Other metals	*0*	*0 %*					
PUR	*0,2*	*1 %*				A-G	
Plastics	*3,9*	*27 %*				A-G	
PVC	*0*	*0 %*					
Textiles: wool, polyester	*0,08*	*1 %*				A-G	
Cardboard (packaging)	*1,8*	*13 %*				A-G	
Various	*1,5*	*11 %*				A-G	
Total	***14,2***	***100 %***	***98,3 %***	***54 %***	***0 %***		

** In % of analysed mass, input to the assembly department at HÅG*

Resource Consumption

Material resources

Table 2

Material resources		Unit	Raw materials production & processing	Transport of components to HÅG	Processing & assembly at HÅG	User phase	Total	Comments
Recycled, renewable resources	Recycled paper/cardboard	kg/seating solution	0,5			0,0	0,5	
	Recycled textiles	kg/seating solution						
New, renewable resources	Water	kg/seating solution	1 402	0,9	20,0	48	1 472	Including process & cooling water. Not including turbine water.
	Biomass as a raw material	kg/seating solution	1,6	1,2E-04	4,7E-04	0,037	1,6	
Recycled, non-renewable resources	Recycled steel	kg/seating solution	3,3				3,3	
	recycled aluminium	kg/seating solution	3,0				3,0	
	recycled copper	kg/seating solution						
	recycled plastic	kg/seating solution	0,017				0,017	
New, non-renewable resources	Iron	kg/seating solution	2,4	1,3,E-03	6,9E-03	7,3E-03	2,4	
	Bauxite	kg/seating solution	0,016	2,6,E-06	2,1E-03	3,5E-04	0,019	
	Limestone	kg/seating solution	1,0	1,6,E-03	0,029	0,021	1,1	
	Minerals, sand & stone	kg/seating solution	4,4	6,1E-03	0,021	0,124	4,5	
	Copper (in ore)	kg/seating solution	1,1E-02	2,9E-06	9,9E-05	1,9E-03	1,3E-02	
	Coal as a raw material	kg/seating solution	5,0E-04		3,6E-03	2,2E-07	4,1E-03	
	Oil as a raw material	kg/seating solution	3,1		3,7E-04	0,00	3,1	
	Natural gas, raw material	kg/seating solution	1,4		8,4E-06	0,00	1,4	
Unspecified		kg/seating solution					0,08	Water is not included in this calculation in order to make it more precise.
		%					0,4 %	
Total		kg/seating solution					21	All resources except for air and water.

Land use and water resources

Land use has not been quantified. Water consumption is included in Table 2.

Energy resources

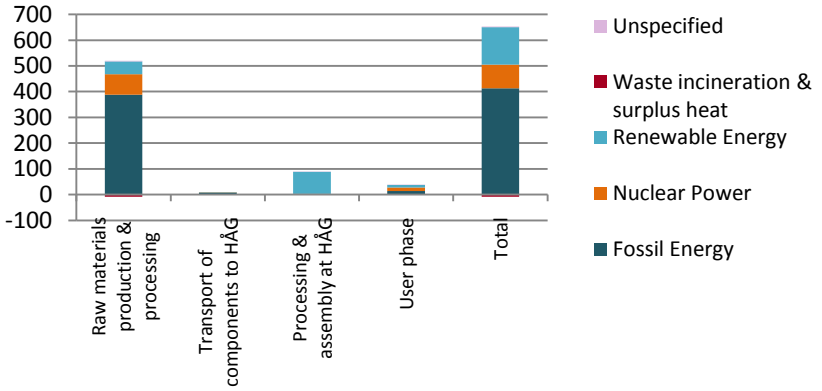


Figure 2.
Energy carrier distribution, in total and for each life cycle phase (%).

Table 3: Energy consumption specified for the different energy carriers and life cycle stages

Energy resources		Unit	Raw materials production & processing	Transport of components to HÅG	Processing & assembly at HÅG	User phase	Disposal	Total	Comments
Fossil Energy	Coal	MJ/seating solution	135	1,3E-01	0,15	6	See "Treatment of waste from the final product"	141	Including lignite
	Oil	MJ/seating solution	93	7,4	1,05	2		103	
	Natural gas	MJ/seating solution	158	0,13	0,75	6		165	
	Peat	MJ/seating solution	2,6	2,3E-07	1,1E-04	6,0E-01		3,2	
	Sulphur	MJ/seating solution	0,13	1,2E-07	3,4E-05	3,5E-05		0,14	
Nuclear Power		MJ/seating solution	79	0,16	0,21	13		93	
Renewable Energy	Biomass	MJ/seating solution	2	6,9E-04	1,5E-03	0,00		2	
	Hydro power	MJ/seating solution	46	0,09	86	8,9		141	
	Wind power	MJ/seating solution	2,0	3,7E-03	4,0E-03	0,48		2,5	
	Solar power	MJ/seating solution	0,006	4,9E-05	5,4E-05	1,4E-03		0,008	
	Geothermal energy	MJ/seating solution	0,00	-	-	0,000		0,00	
Various	Waste incineration & surplus heat	MJ/seating solution	-8,4	-	-	0,00		-8,4	
Unspecified		MJ/seating solution	2,14	-	1,0E-02	3,7E-02		2,19	Including any use of energy with hydrogen as the energy carrier
Total		MJ/seating solution	511	7,9	88	37		644	
Total, to factory gate		MJ/seating solution			607				

The electricity consumption is calculated based on nordic production mix (except if the companies buy certified renewable electricity).

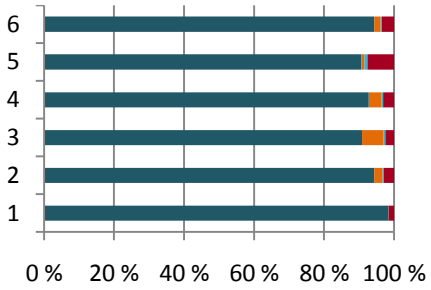
Emissions and Environmental Impacts

Environmental Impacts Table 4

	Indicator	Unit	To the factory gate	User phase
1	Global warming potential, 100 yrs	kg CO2 equ./seating solution	31	1,1
2	Ozone depletion potential	kg CFC-11 equ./seating solution	1,2E-06	1,0E-07
3	Acidification potential	kg SO2 equ./seating solution	0,13	0,004
4	Fotochemical oxidation potential	kg ethene equ./seating solution	0,015	3,7E-04
5	Eutrophication potential	kg phosphate equ./seating s.	0,033	9,9E-04
6	Heavy metals, EI 95	kg Pb equ./seating solution	8,8E-04	1,4E-05

The distribution of environmental impact for each life cycle phase (%)

Figure 3



Waste and the most significant emissions, kg Table 5

Emission		Unit	Raw materials production & processing	Transport of components to HÅG	Processing & assembly at HÅG	User phase	Disposal	Total	Comments
Emissions to air	CO2 (fossil)	kg/seating solution	27	0,57	0,120	1,0	See "Treatment of waste from the final product"	29	
	CH4	kg/seating solution	0,12	1,0E-04	2,2E-04	0,002		0,12	
	N2O	kg/seating solution	1,1E-03	6,9E-06	3,8E-05	5,2E-05		1,2E-03	
	NOx	kg/seating solution	0,06	6,2E-03	6,3E-04	0,002		0,07	
	SOx	kg/seating solution	0,07	1,4E-03	3,8E-04	0,003		0,08	
	VOC	kg/seating solution	0,007	1,0E-03	5,4E-05	2,3E-04		0,008	
	CO	kg/seating solution	0,11	2,3E-03	1,9E-04	5,4E-04		0,11	
	Dioxin	kg/seating solution	1,9E-11	3,3E-14	0	1,9E-13		1,9E-11	
	Chromium	kg/seating solution	7,5E-06	9,1E-09	7,9E-08	5,3E-07		8,1E-06	
	Lead	kg/seating solution	8,3E-05	3,1E-08	3,1E-08	1,6E-06		8,4E-05	
Emissions to water	Water to waste treatment	kg/seating solution	37	-	16	-		62	
	COD	kg/seating solution	0,08	3,8E-04	4,3E-04	1,0E-03		0,08	
	Tot-N	kg/seating solution	6,7E-03	5,9E-07	3,4E-06	4,0E-05		6,7E-03	
	Tot-P	kg/seating solution	5,9E-03	3,6E-07	8,6E-06	2,4E-04		6,1E-03	
	Dioxin	kg/seating solution	1,5E-13	-	-	6,7E-21		1,5E-04	
	Chromium	kg/seating solution	1,4E-04	2,1E-07	3,7E-07	3,4E-06		1,5E-04	
	Lead	kg/seating solution	6,7E-05	4,2E-08	1,4E-07	3,3E-06		7,1E-05	
Waste	Waste to material recycling	kg/seating solution	1,88	-	1,02	1,455		4,4	Including reuse
	Waste to energy recovery	kg/seating solution	1,20	-	0,25	-		2,51	
	Waste to incineration	kg/seating solution	0,016	-	-	0,000		0,016	Without energy recovery
	Waste to landfill	kg/seating solution	22,37	2,0E-01	8,4E-02	1,381		24,0	
	Radioactive waste	m3/seating solution	2,8E-07	6,8E-10	7,4E-10	6,1E-08		3,4E-07	NB! m3 in unit
	Hazardous waste	kg/seating solution	0,41	3,0E-05	0,70	0,003		1,1	Including slag/ashes.
	Other waste	kg/seating solution	0,30	3,5E-03	8,2E-03	2,4E-04		0,31	Unspecified waste

"Processing and assembly at HÅG" also includes emissions from production of the energy that is used in HÅG's production.

Additional Information

The Environmental Declaration has been compiled based on the Product Category Rules (PCR) for the product category Seating solution (2008). This declaration fulfills the requirements in the relevant product category rules.

In accordance with the PCR the furniture's lifetime is assumed to be 15 years. However this furniture will normally have a longer technical lifetime. HÅG gives a 10 year guarantee for all of their seating solutions used for up to 8 hours per day.

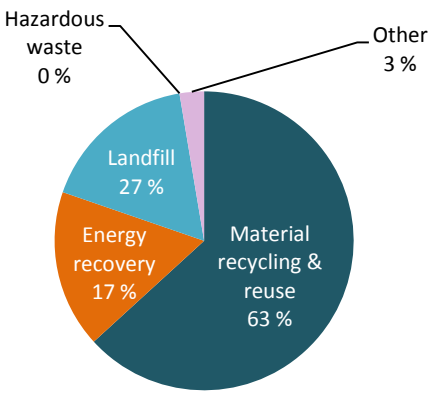
HÅG is committed to environmental protection being an important part of its operations, with focus on the entire value chain of their products. HÅG is ISO 14001 certified and EMAS registered and has Greenguard Indoor Air Quality Certification® under the Greenguard Standard for Low Emitting Products for a number of their seating solutions.

HÅG wants to use recycled and recyclable materials in all of their products and makes conscious choices regarding materials and their content. HÅG endeavours not to use PVC or chromium in new products.

HÅG takes back old office chairs, regardless of brand, with the purchase of new seating solutions. The “Take back” system is also meant to ensure that no HÅG chairs end up on a landfill.

The chair is constructed for a long life, as the mechanical parts and textile cover can easily be changed. The chair is designed such that it can easily be dismantled into pure material fractions for recycling. All of the large plastic parts are marked in accordance with ISO 11469.

Treatment Of Waste From The Final Product



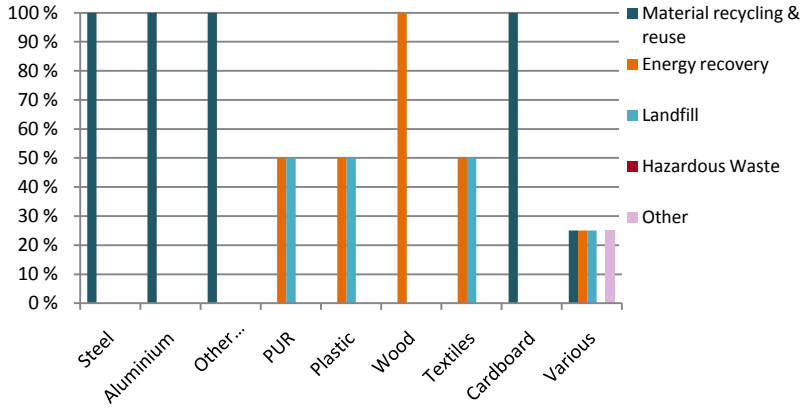


Figure 4: Probable waste treatment for HÅG Capisco Puls 8010

HÅG focuses on designs that make dismantling and recycling easier, by using the minimum amount of glue and embedding in its products.

It is currently assumed that the plastic materials go to energy recovery and landfill. None of the components can be viewed as hazardous waste.

Figure 5: Probable waste treatment for materials in a seating solution

The seating solution has a technical lifetime that exceeds the maintenance period of the functional unit (15 years). Most of the chairs are therefore reused by new owners. When the seating solution finally ends up in the Norwegian waste system, the construction is dismantled and the various materials are separated.

Given the Norwegian waste system, 63% of the materials are recycled and reused, while **the share of recyclable materials in the seating solution is 95%.**

Methodological Decisions

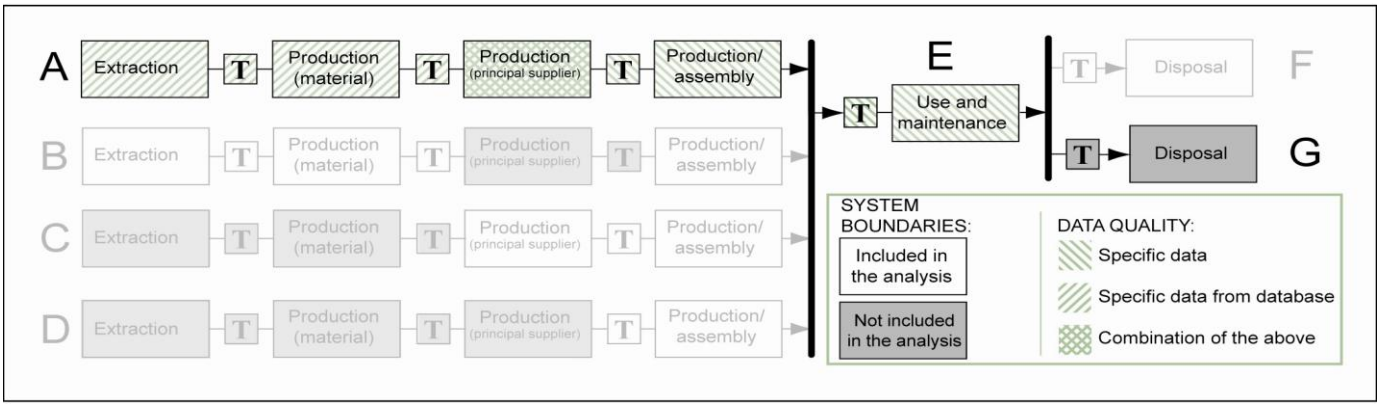


Figure 5: System boundaries and data quality.

Deviation from PCR:

Infrastructure:

Due to choice of database, infrastructure is included in data for energy, raw material production, transport at sea and rail.

Allocation rules:

• Where virgin materials are used, emissions and energy consumption connected with extraction and production are included.

• Where recycled materials are used in the product, emissions and energy consumption related to the recycling process are included.

• Emissions from incineration are allocated to the product system that uses the recovered energy.

• Emissions from incineration of waste without energy recovery are allocated to the production system where the waste arises.

• For suppliers with multi-output processes the allocation is based on the mass balance, as this information has been consistently available from suppliers. There is one exception: The polyester textile producer used economical allocation.

Energy:

• All emissions and consumption of resources related to the production of energy carriers used are included. Literature data has been used for this.

• The electricity consumed is assumed to be from the Nord Pool mix in the Nordic countries, except for the companies that buy certified renewable electricity.

System boundaries:

See Figure 5 and Table 1. Transport upstream is included in "Production (material)".

Use:

The use phase is represented by a scenario for use in Southern Germany. Transport to the customer, vacuum cleaning of the textiles every other year and a textile change once in the maintenance period are included. Washing the metal and plastic is not included. The PCR does not provide detailed guidelines for what should be included in the use phase. The assumptions made are based on experience from office-based companies.

References

Greenguard certificate, Futu, will be available from : http://www.greenguard.org/Default.aspx?tabid=12

The Norwegian EPD Foundation (2008): *Product-Category Rules (PCR) for preparing an Environmental Product Declaration (EPD) for product group Seating solution*

ISO 14040:2006 *Environmental Management - Life cycle assessment- Principles and framework*

ISO 14044:2006 *Environmental Management - Life cycle assessment- Requirements and guidelines.*

ISO 14025:2006 *Environmental labels and declarations - Type III environmental declarations - Principles and procedures.*

Skjerve-Nielssen, C og Lyng, K-A (2011): Ostfold Research report, OR 09.11: "Background data for environmental declaration (EPD) of seating solution HÅG Capisco Puls" (Norwegian)