Environmental Product Declaration

A presentation of the environmental performance of **Kalidro**. An environmental declaration according to the objectives of ISO/TR 14025, based on Life Cycle Assessment (ISO 14044).



Product Description

Simplicity and intelligence is the success of Kalidro.

The 4 leg desk system offers a complete range that is easy to install and to configure. The comfortable height adjustment and the smart cable management fulfil customers' demands.

The model chosen for analysis is the most popular model (reference W3812700). It is equipped as follows:

- Top dimensions: 1600 x 800
- Top type 10
- Top thickness: 19 mm
- Top colour: crystal
- Corner element + frame: snow
- Leg: silver
- Features: cable brackets

Manufacturer

The selected product **Kalidro** is manufactured in Rosenheim, Germany, by Steelcase, for the EMEA market (Europe, Middle East and Africa).

Since 1912, Steelcase has been committed to continually reducing the environmental impacts of its products and activities on a global scale, by constantly seeking more effective ways to conserve resources, prevent pollution and nurture environmental consciousness in its people every day. Sustainable development is embedded in everything we do.

Steelcase has management systems for quality (ISO 9001) and for the environment (ISO 14001 and/or EMAS II), ensuring that our customers are guaranteed the same level of product performance, wherever they are in the world.

Steelcase has a multi-site PEFC certification; for its production facilities at four European sites. The certification acknowledges that Steelcase has gone to great lengths to ensure that the wood used in its products has been sourced from environmentally friendly suppliers.

To show continuous improvements, Steelcase communicates the environmental performance of its products through voluntary environmental labels and declarations. The Steelcase Environmental report looks at things that have helped spur our environmental thinking and commitment and the subsequent actions and results.

For further information see www.steelcase.com



Material Declaration

Kalidro consists of the materials listed below. The total weight is 37 kg including packaging.

metals	kg	%
Steel	15.240	40.1
Aluminium	3.468	9.1

plastics	кд	%
LDPE film (low density polyethylen for packaging	^{e)} 0.511	1.4
Expanded PP (polypropylene for packaging)	0.243	0.7
PA 6 GF 30% (polyamide 6 with 30% glass fibre)	0.188	0.5
PP (polypropylene)	0.139	0.4
PA 6 (polyamide 6)	0.129	0.3

other materials	kg	%
Particle board	16.885	45.7
Cardboard for packaging	1.245	3.4

Environmental Product Declaration

The potential environmental impacts of **Kalidro** (incl. packaging) throughout its entire life cycle – including raw materials extraction, production, transport, use, and end of life – were assessed using Life Cycle Assessment (LCA – ISO 14044) in December 2006. Both method and product may have been subject to improvements since then. Environmental declarations from different programmes may not be comparable. The **functional unit** – i.e. the quantified performance of the product for use as a reference unit – used in the Life Cycle Assessment was chosen as "Provision of comfortable office working – with the features stated in the product description – for 8 hours a day, 5 days a week over 15 years".

Life Cycle Inventory Analysis

The Life Cycle Inventory Analysis covers all life cycle stages as shown below.



This stage includes raw

materials extraction and

ready to be used.

transformation into material

Materials



Production This stage comprises all production and assembly processes taking place at Steelcase or at their suppliers. Data was obtained from suppliers and from the ISO 14001 / EMAS II environmental management systems of the production site.

Transport

Transport from suppliers to the production site and transport from the production site to the EMEA market (Europe, Middle East and Africa) is considered.

Use

During the use stage of the product – the longest stage of the life cycle – no relevant environmental impacts occur.



End of life Any product can be disposed of in different ways, or become a resource itself. Based on current European averages it was assumed that about 60% of the products are sent to landfill, 27% are incinerated and 13% are recycled at the end of their useful life.

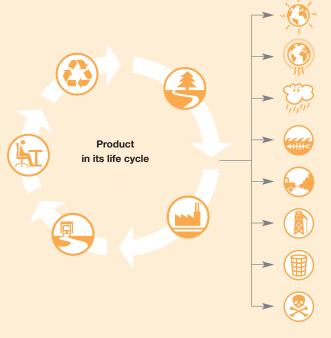
Distribution of the environmental impacts for the relevant life cycle stages

	Category	Unit	Total	Materials	Production	Transport	Use	End of life
	Global warming	[g CO ₂ -eq.]	51 500	50 100	17 500	2 550	No relevant environmental impacts occur	- 18 600
535	Stratospheric Ozone depletion	[g CFC11-eq.]	0.0152	5 910	7.25 x 10 ⁻⁷ *	5.39 x 10 ^{-19 *}	No relevant environmental impacts occur	- 0.00306
	Acidification	[g SO ₂ -eq.]	263	343	88	23	No relevant environmental impacts occur	- 191
	Eutrophication	[g NO ₃ -eq.]	401	277	186	39	No relevant environmental impacts occur	- 100
	Photochemical smog	[g C ₂ H ₄ -eq.]	26	30	1	4	No relevant environmental impacts occur	- 8

* This value is extremely lower than 0,0001 g CFC11-eq (Chloro-Fluoro-Carbon 11 equivalent).

Life Cycle Assessment

Environmental impact categories



Global warming

is due to emissions of greenhouse gases, causing the rise of the global temperature.

Stratospheric ozone depletion is due to aerosols and other gaseous pollutants, causing the destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life.

Acidification

is due to emissions of acids, causing the degradation of materials such as metals, limestone and concrete, and damage to trees and life in lakes and rivers.

Eutrophication

is due to emissions of nutrients, causing blooms of algae. The degradation of dead algae consumes oxygen leading to the loss of plants and animals.

Photochemical smog

is due to a mixture of pollutants which includes volatile organic components, particulates, nitrogen oxides, ozone... It's harmful to human health (causing inhalation irritations lung problems, coughing and wheezing) and the environment (damage to plants and crops).

Abiotic resource depletion

is due to extraction and consumption of non-renewable resources such as oil, coal and metals.

Waste

is the bulk waste and hazardous waste created during the whole life cycle of the product.

Toxic substances

are substances which cause harm to the natural environment or human health, emitted during the whole life cycle of the product.

Environmental aspects of Kalidro

The contributions of inventory parameters to different impact categories throughout the entire life cycle of Kalidro chair are listed below. Contributions to Stratospheric Ozone Depletion are tracked but not mentioned below due to extremely low values. Life cycle inventory parameters are mentioned only if they contribute more than 1% of the total impact in that impact category.

Category	Parameter		Inventory value Unit	Characterized impact	value Unit
Global warming				Total	51 500 g CO₂-eq.
	CO ₂	(carbon dioxide)	43 200 g	lotal -	83.9 %
100	HCs	(hydrocarbons)	18 g		10.5 %
~ (² A) ~	CH4	(methane)	67.9 g		3.3 %
	CO	(carbon monoxide)	363.3 g		1.4 %
- 3	00	(carboit monoxide)	303.3 Y		1.4 70
Acidification				Total	263 g SO ₂ -eq.
\sim	NOx	(nitrogen oxides)	178.5 g		47.5 %
Ç¥[]}	SOx	(sulphur oxides)	99.3 g		37.8 %
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Eutrophication				Total	401 g NO3-eq.
	NOx	(nitrogen oxides)	178.5 g		60.1 %
\frown	phosphates	(11.7 g		30.4 %
CCCC	NO ₂ -N	(nitrogen oxide)	15.1 g		5.1 %
	110211	(introgen exists)	10.1 g		0.1 /0
Photochemical smog				Total	26.2 g C₂H₄-eq
	CO	(carbon monoxide)	363.3 g		41.6 %
	toluene		13.8 g		31.6 %
	NMVOCs*	(from diesel engines)	6.73 g		15.4 %
	ethene	(norm alcool originoo)	0.9 g		3.8 %
	CH ₄	(methane)	67.9 g		1.8 %
Abiotic resource depletion					
<u> </u>	Iron		11 200 g		_
	Crude oil, fuel	(in ore)	7 660 g		-
(図))	Coal, fuel	/	6230 g		_
	Lignite, fuel		5 140 g		_
	Natural gas		3 540 g		_
	Naturai gas		5340 g		
Waste					
\bigcirc	Bulk waste		3440 g		-
	Hazardous was	te	34.2 g		-
Toxic substances			04.0		
	Toxic substance	es	21.8 g		-

No characterized impacts were calculated for Abiotic resource depletion, Solid waste and Toxic substances, due to lack of credible, internationally agreed characterisation factors.

* VOCs = Volatile organic compounds, NMVOCs = non-methane VOCs

Additional environmental information

Environmental labels and declarations on products and materials



Kalidro complies with the German environmental certification "Blauer Engel"



The wooden components of Kalidro are labelled with PEFC (Programme for the Endorsement of Forest Certification)



The particle boards comply with the low emission E1 standard (EN13986)

Actions for reducing the environmental impacts at each stage of the environmental life cycle

End of life

Kalidro is 99% recyclable by weight. The cardboard and plastics used for packaging are 100% recyclable. After delivery of the desks, about 40% of the flexible EPP edge protections are returned to Steelcase and directly reused for other desks. If broken during transport or installation they can be repaired.
Kalidro is quick and easy to disassemble using normal hand tools. For easy sorting and an effective recycling, plastic parts weighing more than 50 g are marked for recycling.
Kalidro can be integrated into the Steelcase Environmental Partnership Program designed to ensure environmentally responsible after use strategies for furniture.

Jse

 Kalidro is designed for a long product life, with replaceable parts that are easy to change.
 Maintenance information is available in the User's manual

Transport

 Minimised packaging weight and volume helps to improve filling rates and thus require less energy for shipping.

- Materials
 - Kalidro contains 34% recycled materials by weight, and contains no hazardous materials (i.e. no Lead, Mercury, Cadmium, and Chrome VI), no PVC, and no halogenated flame retardants.
 - The packaging contains at least 55% recycled materials.
 - The table-top thickness has been reduced to 19 mm, which means 25% less wood than for usual table-tops.
 - The legs' corners are made of 100% recycled aluminium. This leads to a 30% reduction of impacts on Global Warming on the whole life-cycle, compared to the use of primary aluminium.
 - The legs tubes are made of powder painted steel. This leads to a 25% reduction of impacts on Global Warming on the whole life-cycle, compared to the use of anodised primary aluminium.
 - Paper and packaging have prints with water-based inks i.e. without solvent.

Production

- The production site in Rosenheim has an ISO 14001 and EMAS II certified environmental management system. • Powder painting is VOC-free and free of heavy metals;
- unused paint that does not attach to the product can be directly reused in the process. Furthermore, more elements are painted at the same time, thus saving energy.
- Minimal steel waste generation: the desk structure requires no cutting operation.
- Wood waste from table tops cutting is used for heating (gas filtering system): this saves 40 tons of natural gas and avoids 150 tons of CO2 emissions per year for the Kalidro production.
- Glue used to attach edges on the table-top is water based and releases no VOCs.

Compilation and Verification Process

- The LCA study of **Kalidro** (reference W3812700) was carried out by Steelcase, according to ISO 14044, together with the ENSAM of Chambéry -France (Ecole Nationale Supérieure des Arts et Métiers). It was then critically reviewed by the IPU Product Development - Denmark.
- The independent verification of the environmental declaration (EPD ISO/TR 14025) was carried out by IPU Product Development Denmark.

References

Form of document

- ISO/TR 14025: Environmental labels and declarations Type III environmental declarations.
- Lee, K.M., Park, P.: "Application of Life-Cycle Assessment to Type III Environmental Declarations", Environmental Management, Vol. 28, No. 4, 2001, pp. 533-546.

LCA method and characterisation factors

- EDIP method: Wenzel, Hauschild, Alting: "Environmental Assessment of Products" Volume 1 (Methodology, tools and case studies in product development), Chapman and Hall, 1997, ISBN 041280800 5.
- Intergovernmental Panel on Climate Change (IPCC), status reports, 1995 and 2001.

End of life scenario

• European Topic Centre on Waste and Material Flows, Copenhagen, Denmark, Sept. 2002, http://waste.eionet.eu.int

Contact

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