# **Environmental Product Declaration**

A presentation of the environmental performance of **Westside**. An environmental declaration according to the objectives of ISO/TR 14025, based on Life Cycle Assessment (ISO 14040-43).



# **Product Description**

The **Westside** chair is made with a single shell, with just the right shape, angle and flexibility to provide maximum comfort for the back.

The **Westside** chair is engineered for demanding spaces like informal office areas, cafeterias and hotels where traditional seating falls short.

The model chosen for analysis is the **Westside** chair reference 11 LUG 30:

- Plastic shell in plastic
- Tubular structure in steel
- Width: 545mm
- Depth: 590mm
- Height: 820mm

# Manufacturer

The selected product **Westside** chair is manufactured in Sarrebourg, France, 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.

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**

The Westside chair consists of the materials listed below. The total weight is 5.057 kg, including packaging.

metals	kg	%	plastics	kg	%	other materials	kg	%
Steel	2.156	42.6	PP (polypropylene)	2.611	51.6	Cardboard	0.015	0.0
			LDPE film (low density polyeth for packaging	nylene) 0.154	3.0	for packaging	0.015	0.3
			PC (polycarbonate)	0.094	1.9			
			PE foam (polyethylene) for packaging	0.015	0.3			
			PA6 (polyamide)	0.013	0.3			

# **Environmental Product Declaration**

The potential environmental impacts of the Westside chair (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 14040-43) in spring 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 seating - 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 transformation into material ready to be used.

# Production

This stage comprises all production and assembly processes taking place at Steelcase or at their suppliers. Data was obtained EMEA market (Europe, from suppliers and from the Middle East and Africa) ISO 14001 environmental management system of the production site.

## Transport

Transport from suppliers to the production site and transport from the production site to the is considered.



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



End of life

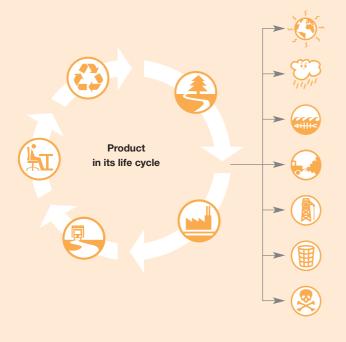
Any product can be disposed of in different ways, or become a resource itself. Based on current European averages it was assumed that about 60% of the products are sent to landfill, 27% are incinerated and 13% are recycled at the end of their useful life.

## 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 <sub>2</sub> -eq.]	18 844	5910	10 100	2 550	No relevant environmental impacts occur	284
	Acidification	[g SO <sub>2</sub> -eq.]	194	72	101	23	No relevant environmental impacts occur	- 2
	Eutrophication	[g NO <sub>3</sub> -eq.]	164	57	72	37	No relevant environmental impacts occur	-2
	Photochemical smog	[g C <sub>2</sub> H <sub>4</sub> -eq.]	6	2	0	3	No relevant environmental impacts occur	0

## Life Cycle Assessment

Environmental impact categories



#### **Global warming**

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

#### 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 the Westside chair

The contributions of inventory parameters to different impact categories throughout the entire life cycle of the Westside chair are listed below. Life cycle inventory parameters are mentioned only if they contribute more than 1% of the total impact in that impact category.

Category	Paramet	er	Inventory value Unit	Characterized impact	<b>value</b> Unit
Global warming	CO₂ HC CH₄	(carbon dioxide) (hydrocarbons) (methane)	17019 g 3 g 23 g	Total	<b>18844 g CO<sub>2</sub>-eq.</b> 90.4 % 5.3 % 3.0 %
	SO <sub>x</sub> NO <sub>x</sub>	(sulphur oxides) (nitrogen oxides)	109 g 122 g	Total	<b>194 g SO<sub>2</sub>-eq.</b> 56.3 % 44.1 %
Eutrophication	NO <sub>x</sub>	(nitrogen oxides)	120 g	Total	<b>164 g NO<sub>3</sub>-eq.</b> 99 %
Photochemical smog	NMVOC* CO CH <sub>4</sub> VOC*	(from diesel engines) (carbon monoxide) (methane) (from heating with natural gas	5 g 92 g 23 g 0.5 g	Total	6 g C₂H₄-eq. 50.0 % 45.0 % 2.6 % 1.5 %
Abiotic resource depletion	Coal Oil Iron Lignite Natural gas Manganese		3 000 g 4 088 g 1 644 g 260 g 2 527 g 10 g		
Waste	Bulk waste Hazardous	waste	535 g 1 g		- -
Toxic substances	Toxic substances		3 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

#### Environmental labels and declarations on products and materials



Westside complies with the French environmental certification "NF Environnement" (ISO 14024)

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

## End of life

• Westside is 97% recyclable by weight. The cardboard, PE foam and LDPE film used for packaging are 100% recyclable.

 Westside is quick and easy to disassemble using normal hand tools. It contains only a few different materials, making sorting for recycling easy. Plastic parts are clearly labelled for easy sorting and an effective recycling.

• Westside can be integrated into the Steelcase Environmental Partnership Program designed to ensure environmentally responsible after use strategies for furniture.

## Use

• Westside was designed for a long product life, with replaceable elements.

## Transport

Westside is lightweight and stackable.
Minimised packaging weight and volume also help us improve filling rates
and thus require less energy for shipping.

### Materials

 Westside contains no hazardous materials (i.e. no Lead, Mercury, Cadmium, Chrome VI, (seating) or CFC or HCFC in the foam, no dangerous materials such as PVC, and no hazardous flame retardants such as halogenated flame retardants.

• Westside contains 14% recycled materials, by weight.

- The packaging consists of cardboard, PE foam and LDPE film (Low Density Polyethylene), both containing at least 30% recycled material.
  - The Westside chair weighs only 4.9 kg and is made with only 2 main low energy materials (steel and PP). The use of gas injection in the plastic shell is an innovation.

• Paper and packaging use water based inks without solvent.

## Production

• The production site in Sarrebourg has an ISO 14001 certified environmental management system.

• Westside was designed to be made with minimal waste, energy consumption and environmental impact.

• Powder-coat 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.

# **Compilation and Verification Process**

- The LCA study of the Westside chair (reference 412 LUG 30) was carried out by Steelcase, according to ISO 14040-43, 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 0 412 80800 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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