

enea



Environmental Memory- LOTTUS

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1. General information

Product: LOTTUS

Designer: LIEVORE, ALTHERR, MOLINA

2. Enea with the environment

ENEAD started in 1984 focused to manufacture and market contemporary design furniture. During all these years it had an excellent evolution, with an important presence in the world market furnishing lots of unique buildings in the hands of renowned architects.

The company, in the manufacture of its products, shows its concern for the natural environment through a philosophy of design and production where the following environmental criteria are taken into account:

- **Simplicity:** during the design process seeks to minimize the number of components, achieving a perfect interplay between them.
- **Recycling and reuse:** design seeks the use of recyclable and recycled materials for their manufacture, as well as easy removal that would facilitate the recycling and reuse.
- **Use of non-dangerous materials:** ENEAD also works to reduce and replace the use of dangerous materials or negative for the environment. For example, using epoxy paints that are free from solvents and compounds volatile organic harmful.

ENEAD uses a few production processes of high technology, in addition to an intense process of research and adaptation of materials to the needs of use. Various processes have been submitted from the beginning to a rigorous policy of quality, what has led to the company to be one of the first Spanish companies, manufacturers of furniture design, in obtaining the **ISO 9001 quality certification** and certificate of the **system of management of ecodesign**, awarded by AENOR, complies with the **UNE-EN ISO 14006** and the certificate of the system of environmental management according to the **quality certification UNE-EN ISO 14001**.

All these processes, controls and selection of materials, guarantee the high quality of the products of ENEAD, both in strength and durability as its finish, but with the commitment to achieve all this, taking into account the environment, framed within sustainable development. The objective is always meet current needs without compromising future resources.

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3. LOTTUS, aspects of environmental innovation

Lottus Chair, designed by Lievore Altherr Molina follows the line and style of stool Lottus. It is a program of seats formed by monoshells of injected polypropylene which combine color and upholstery in the seat. The design permits that it can be mounted on different metal structures of painted tube: 4 legged stackable with and without arms, stackable cantilever and swivel central base, with wheels, as well as 3 different types of armrests: steel, aluminium and wing arm. Family evolves presenting Lottus Spin versions, fixed and rotating 4 feet and the child version. Lottus Chair is also available with fully upholstered and Oak veneered shells. Its necessary to add a version of chair with high back HIGH, a new aluminum base for Office chair, wood structure and wood shell in 2D and 3D. All this added to their contained dimensions, its studied ergonomics and its friendly shape, make Lottus chair a versatile product and wide range of application, whether in the most demanding contract as well as in the home.

During the process of design, production, editing and marketing of LOTTUS tried to minimize the number of components in the seat, as well as reduce and replace the use of dangerous materials or negative environment.

3.1. Product specifications

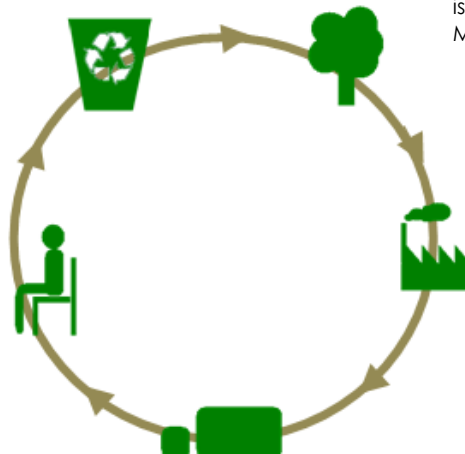
	MATERIAL	Kg.	%
Chair	Steel	2.35444	40.93%
	Polyethylene	0.0086	0.15%
	Polypropylene	3.23	56.14%
	PVC	0.16	2.78%
Package	Polyethylene	0.14	8.93%
	Cardboard	1.4275	91.07%

3.2. Lottus life's cycle.

At the end of life stage referred to different final destinations of the materials that make up the product.

This phase takes into account the transport of materials from their place of origin and have suffered some kind of transformation. For the calculation is included in the phase of MANUFACTURE.

In the phase of use does not need any special maintenance, clean with soap and water, and estimating the useful life of a chair of this type in 10 years, these materials will be negligible compared to the other in the Analysis of the Life Cycle, so it is not included the use phase in LCA.



At this stage are recorded the Transformation that take place in the purchased raw materials to give rise to the product that ENEA offers.

This phase takes into account both packing needed to transport the product as the transport of the product itself. For the calculation is divided in two stages PACKING and TRANSPORT.

3.3. Environmental impacts.

Enea uses environmental software LCAManager, which allows obtaining values for different categories of environmental impacts using various methodologies. In LOTTUS we have calculated values for impacts according to the methodology

- **CML2011:** Impact calculation methodology developed by the Centre of environmental sciences of the University of Leiden-Holanda..
- **Ecoidicator95:** Dutch Ecodesign methodology defined PRE CONSULTANTS. Provides unique value added categories of environmental impact (Goedkoop, 1995).
- **Ecoidicator99:** Dutch ecodesign methodology defined PRE CONSULTANTS. Provides unique value added categories of environmental impact (Goedkoop and Spriensmaa, 1999).

CATEGORY	Metodology	Units	Total Value
Global Warming (GWP)	CML2001	Kg CO ₂ -eq.	19.9
Reduction of the Ozone Layer	CML2001	Kg CFC11-eq.	2.87x10 ⁻⁶
Acidification	CML2001	Kg SO ₂	7.47x10 ⁻²
Photochemical oxidants	CML2001	Kg ethen-eq	5.34x10 ⁻³
Eutrophication	CML2001	Kg NOx-eq.	5.54x10 ⁻²
Heavy Metals	Eco indicador 95	Kg Pb-eq.	2,56E-06

3.5. Additional environmental information

- The product is suitable for reuse.
- The foams have not been manufactured with CFC or HCFC
- All plastic parts weighing more than 50g are marked according to ISO 11469 facilitating their classification for recycling.
- ENEA guarantees the availability of pieces at least 5 years, which avoids their removal and allows you to continue to use with minimal impact when compared with the manufacturing of a new chair.
- The 100% of the steel used is recycled.
- Approximately 10 percent of the plastic used is recycled.
- The materials used are 100% recyclable at the end of its useful life.
- The packaging is made of easily separable materials.
- The paints and lacquers used do not contain aromatic solvents or carcinogenic substances harmful to the reproductive system, mutagenic, toxic or allergenic according to Directive 1999/45/EC.
- The used plastic items do not contain heavy metals and phosphates.
- The waste generated is removed by authorized waste management enterprises.



Eco-design criteria

Diseño Design for the expansion of functions, multifunctionality, modularity and stackable, despite its apparent simplicity.



Design for reuse and recycling, ensuring easy removal and the use of recyclable and recycled materials.

Design for the reduction of use of materials, specially dangerous for human health and the environment.

