

Design for Recycling

recycled product
recyclable product



Generalitat de Catalunya
Departament de Medi Ambient
Junta de Residus



centre català
del reciclatge

The Government of Catalonia, with the aim of encouraging the recycling of waste in Catalonia, created the Catalan Centre for Recycling attached to the Waste Agency of the Department of the Environment at the end of 1999.

One of the Centre's priority work areas is ecodesign, or more particularly, **design for recycling**. The **Guide of Case Studies of Ecodesign, Design for Recycling**, is one of the Centre's publications aimed at the industrial fabric of Catalonia, that offers design for recycling as an instrument of environmental prevention to be applied during the design stage of products.

Therefore, given the new legal framework of Europe and the globalisation of markets, the companies that wish to remain competitive, open to new opportunities, must recognise and face the challenges of the demands for environmental quality, and the application of design for recycling is a means to achieve this.

The structure of the guide

The guide introduces the following aspects:

- The stages to be followed by a company that incorporates design-for-recycling criteria into its products
- The range of the main ecodesign strategies that can be applied to the design of the products.
- A collection of 35 case studies of design-for-recycling experiences on products made by Catalan companies in the following sectors:
 - car components
 - building
 - packaging and wrapping
 - urban amenities
 - others



What is design for recycling?

The designed-for-recycling¹ method incorporates recycling and recyclability criteria into the design phase of products, with the aim of obtaining recycled and/or recyclable products. The environmental variable is just another requirement of the product that is added to all the others, such as its cost, its safety, its manufacturability, its use, etc.

The application of this variable does not affect the rest of the properties of the product, and price and environmental improvement are combined with the aim of manufacturing products with a reduced environmental impact associated to its entire life cycle and competitive prices.

What are products designed for recycling, or in other words, recycled and/or recyclable products?

Recycled products are those which are manufactured using recycled materials or components from products no longer in use.

Recyclable products are those that are manufactured to be recycled at the end of their useful life. In other words, mono-materials are used, the toxic and hazardous substances are eliminated and a modular manufacturing system is used that produces easily-dismantled products, compatible materials are used, material that is difficult to use is identified by means of codes, and so on.

¹ Julio Rodrigo and Francesc Castells, Rovira i Virgili University

The stages to be followed by a company that incorporates design-for-recycling criteria into its products

Company commitment

- 1** • The company management approves the project.
• The entire organisation is informed.

Creating the work team and scheduling the project

- 2** • Define the work team according to the type of company and its possibilities.
• Design, schedule and carry out the diverse stages of the design-for-recycling process for each product.
• Assess the need for each purchase and the associated environmental impact.

General analysis of the product

- 3** • Analyse the following aspects of the product:
 - Information about the product: detailed description (functions, components, etc.), key aspects of the design and production, materials used in its manufacture and transport, resources used during its use, emissions generated and average life.
 - Company, resources and capacities: installations, resources, environmental policy, work team, and so on.
 - Pressure and potential for the change of the product: environmental aspects, new materials, new technologies and requirements of clients or market demand.
 - Market: functions, quality, price, and so on.
 - Competitive products: identification of other products made by competitors with good environmental performance.

Assessment of the environmental impact of the product and proposal for environmental improvements

- 4** • Draw up the analysis of the life cycle of the product:
 - Overall view of the most significant environmental impacts caused by the product during the different stages of its life cycle.
 - Identification of the priorities and environmental improvements to be taken into account during the design process.

Introduction of the environmental improvements selected

- 5** • Prioritise the improvements selected.

Assessment and follow-up

- 6** • Assess the effect of the environmental improvements incorporated.
• Set up dynamics and tools for continuous environmental improvement.

Ecodesign strategies applicable to the various stages of the life cycle of products:

Obtaining raw materials

Design for:

- Preserving resources
- A low impact of the materials

End of life

Design for:

- **Recyclability**
 - the use of mono-materials
 - the disposal of toxic and hazardous substances
 - modular manufacturing and easy dismantling
 - the use of compatible materials
 - identification of materials that are difficult to recognise, by means of codes

Manufacturing

Design for:

- **Recycling:**
 - use of recycled materials
 - re-using the components of products no longer in use
- Clean production

Use

Design for:

- Efficient use of energy
- Saving water
- Minimisation of the consumption of auxiliary products
- Pollution prevention
- Durability

Distribution

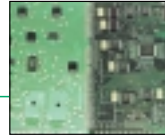
Design for:

- Efficient distribution

Presentation of case studies of design for recycling:

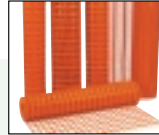
Car components

- Lubricating oil
- Devices, control boxes and electronic circuit systems



Building

- Pipes
- Plastic flooring
- Soundproofing boards
- Asphalt conglomerate



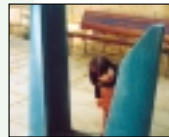
Packaging and wrapping

- Packaging with a return and recovery system for the supply of the base product
- Packaging for perfumes, moisturising creams, etc.
- Boxes for food distribution
- Pallets
- Diverse bags (for rubbish, agricultural plastic films, etc)
- Recycled paper



Urban equipment

- Rubbish containers
- Urban fences
- Fountains
- Canopies



Others

- Glass articles
- Shoes
- Shopping trolleys
- ...



The Catalan Centre for Recycling at the Waste Agency has a list of categories of recycled and/or recyclable products at the following website:
<http://www.junres.es/CCR/index.stm>

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<http://www.junres.es/CCR/index.stm>



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