

## Ecological design of household electronic products

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**Abstract.** Modern household electronic products design solved those environmental harmful problems caused by unreasonable design from ecological way. Ecological design of household electronic products is to assure the minimum harm to environment in the whole product life cycle, that is to cut down environment harmful factors in raw materials choosing and producing, using, disuse, recycling, processing and other steps to the minimum extent. When designing, a certain research and knowledge should be considered, then the household products design would be more ecological, and harmony coexist with the environment.

### Introduction

Ecological design is based on sustainable concept and takes the full view of the whole product life cycle, even in the beginning of product design, resource and environment issues are considered, such as choosing clean energy and environment friendly materials. Solving dirt and saving energy from original step is an effective way of promoting saving and environment friendly living and consumption style.

### "Ecological concept" and design

**Definition of ecological design.** With the gradual improving of human environmental awareness, the importance of product design with ecological basement is also rising. Product design concept starts to follow sustainable development principles, and begin to think about ecological environmental problems during product design. To protect environment and improve the living quality have become one of the task which should be considered and finished in product design, "ecological concept" gradually become an important influence in the whole product development and design.

Ecological concept design takes recycled resources using production, to save resources, and turns to ecological design on the base of harmony coexistence with the nature. By means of deassembly, recycling and reusing ways, product's life and using life cycle are prolonged. By the end of its life, the used out materials can be reclaimed and treated, so as to be use in other product's producing and manufacturing, and then improving the resources reusing rate. The primary task of ecological design is to see saving resources as an efficient mean in the coexistence of human and the nature, because the realization of product needs echnology and economy bases, while recycling, it also needs certain cost and technology, and so as the realization of ecological and energy saving products. Nowadays, many materials have high cost on recycling use, even higher than traditional disuse treatment. Therefore, product with lower resources in producing and manufacturing relatively is a cost saving and economical way. And so, it is the most economical and effective choose in ecological conceptual design is to reduce the use of resources.

**Product and Ecological Design.** So many products appear in the market with great improved functions and decorations to satisfy the consumer needs, designers have to change different product appearance, including change the material and technology, pursuing new form, and all these bring new material pollution and waste, which cause so many inconvenient to the living environment. As human gradually recognize the environmental problems, they begin to search ever kinds of means to solve them, which contain technology,mental and design aspects. And then born "Ecological design", "Sustainable design", "Green design", "Energy-saving design". Ecological design will turn

to be the main product producing style with the purpose of protecting the environment. It try all best to reduce the harm to the environment caused by product design when realizing the consumer functional needs. And this is good for both human and the nature.

### **Green needs of household electronic products**

As China's industry in transition, consumer psychology gradually diversified, people pay more and more attention to mental function when focus on practical function of the product at the same time, and thus consumer durables production is decreased, the market replacement of those regions with higher penetration will gradually increase in order to satisfy consumer demand. All kinds of domestic demands are increasing, the volume of trade with foreign countries is also increasing, and so as the product categories in Chinese market. The various kinds of electronic products in China's own brand supplies a higher level consumption demand to consumers, the opening market gradually realized the blend of abroad technology, and the advances in technology enable enterprises to gradually onto the track of sustainable development.

Firstly, household electronic product design turns to a personal trend. It more emphasis the environment and consumers' fashional tastes, just like popular fashion, people tweet electronic products with fashionable view. Then it is humane sense. To certain extent, human design is not only the modern appliances design trend, but also the basic trend of other product design. Once satisfied the functional demand, human feeling appears. And then human-oriented design should be concerned, which is more emphasize the exchange between human and things. Broken down the indifference and serious feelings of products and turned it out to be a friendly, comfortable, convenient and full of human design will be the main stream of future design. The third trend is high technological. Household electronic products turn to be more and more smart, it can be changed according to consumer needs and realize intelligence. This is the best work condition with the lowest water, electricity and time costs, which achieves the environmental friendly needs. And the last trend is green consumption of the whole household electronic products. People now prefer to construct an ecological family living environment that is healthy, fashion and freely interconnection, and this needs integration of all household electronic appliances. In front of this new consumption need, household appliances design mode has to improved from the traditional ways to a higher ecological systematic ways.

### **Exemplification of "Ecological concept" in household electronic product design**

Green design is the main method in ecological design. From the purpose of product design aspect, it is to use green materials, cost minimum material resources and get the maximum using value. Those products can improve human living quality and are suitable with the current social aesthetic needs.

The most basic and important way is to use renewable, recycle and less pollution, low energy cost materials. Those are all called ecological materials. Then product structure design in ecological way should be considered. When realizing the basic function, focusing on the structure in easy disassembling and recycling ways in order to get more rational design is another effective way. Finally, suitable function, technology or new technology, new theory can also insure less energy cost and energy lost.

Ecological concept focused on the harmony of human and the nature, emphasize the environmental balance, and is targeted to try all best to reduce energy cost, improve energy recycling rate. When considering recycling problems at the beginning of ecological design in the whole product life long time, that we can fully use resources and protect the environment.

### **"Ecological design" trends of future household electronic products**

**Household electronic products in harmony with the nature.** Life from nature, and man is part of the nature, who live every day in the embrace of nature, nature is a source of inspiration for

designers to create. Harmony between man and nature can make our lives filled with taste of nature. Household electronic products as a link bridge between the user and the natural environment, should bring as much natural elements to the user as possible, which is also an important manifestation of the concept of ecological design principles, and it will give people a brandnew and modern lifestyle. Product design goal is to attain consumer demand, product design for the harmony between man and nature, the communication of household electronic products and the natural environment is another major goal of the pursuit of ecological design, we should better take use of ecological design elements in household electronic product design, use natural renewable resources as the basic condition for their products, make them better integration with nature.

**Simple appropriate structure and surface treatment.** As ecological product design, using a simple structure and surface treatment process can save materials. And the simple structure is a minimalist design. Famous French designer Philippe Starck's work is a good illustration of this point, which mostly use recyclable materials in design. As shown in Figure 1, named environmental television designed by Philippe Starck, the overall design is simple and elegant, and full of fantasy. Applied in paper material, it is easy for recycling. The minimal decoration as well as shape in the extreme, nice function, unpretentious temperament and mellow, gives a simple but rich effect.



Fig.1 Environmental television design



Fig.2 Smart watch design

**Proper function.** Simple design also need to ensure consumers' proper functions. Different consumer groups, the functional requirements of a product is not the same. A simple and suitable design simplifies the unnecessary features and decorative needs, ensure providing the unmistakable features that really suitable for the users. Such a product design can guarantee to meet consumer demand basis, to minimize the unnecessary and redundant functions. thereby reducing waste on the whole, and to conserve resources. Figure 2 is a smart watch design, simple and elegant in the overall design appearance, but no lack of sense of technology, appropriate design not only to meet the needs of consumers, but also will guide the consumer's needs. In the growth of consumer demand, the product can have up to achieve increased function needs besides the basis of the previous one. This is the consider for product continues possibilities in product design, and it is the needs of sustainable design.

## Conclusion

Product function should give people a sense of affinity but not waste their time in familiarity in the gradually rapid working and living pace currently. When designing, materials choosing, whether can be recycled and reuse should be considered. If the designers pay no attention to the living environment, have no environmental conscious and show no interests in the pollution and harm caused by product in and after using, it eventually will bring loss to enterprises, and also make incurable damages and disasters to the nature. Green product design and producing, must begin with ecological design. It bases on ecological concept and method, such as saving energy and protecting environment, emphasizing protecting the natural nature, fully use resources, human oriented and is friendly to the living environment.

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