Developing Design Method for Green Innovative Products

發展一綠色創新產品之設計方法

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Abstract

The development of green creative products has been the current trend and challenge facing the development of a sustainable society. In this paper, a design method was proposed and an improved design of the fire-extinguishing system for household kitchen was used as an example to demonstrate the process of this design method. The method includes three stages which are problem definition, problem solving, and solution evaluation. This innovative design idea provides a reference model to improve original product or to design a new product with eco-design and TRIZ.

Keywords: TRIZ, Eco-Innovation, Function Attribute Analysis Diagram, IDEF0 System Analysis, Eco-Compass.

1. Introduction

The early design phases, especially in preliminary design phases, greatly affect the eco-effectiveness of a product. Therefore, it is very important to consider the environmental impact in the design phases. Design for X (X may be manufacturing, assembly, delivery, etc.) has been an important design philosophy for product engineers [Kao et al. 2001, Huang and Mak 1999]. In recent years, many eco-design methods have been proposed [Tukker et al. 1999, Gottberg et al. 2006]. Furthermore, there are many TRIZ tools adopted in eco-design tasks to construct an eco-innovation method [Pujari 2006, Smith 1999]. However, how to analyze the problem and evaluate the related design result is seldom investigated. Therefore, it is worthwhile to discuss how to develop a integrated method which can be adopted to whole problem solving process rather than some piecewise tool. In this paper, some popular tools such as the TRIZ tools, system analysis tools, as well as criteria-evaluation tools are adopted to form an effective design methodology for the analysis and evaluation of the green product development. The proposed method includes three stages - problem analysis, problem solving, and solution evaluation.