

Research on Manufacturing of Green Clothing Industry Based on Consumption of Energy Resources

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Keywords: Resource consumption, green clothing design, clothing manufacturing, energy saving and emission reduction.

Abstract: The world's energy resources are currently being consumed severely, and the apparel industry is no exception. How to save energy and reduce emissions and reduce energy waste is the research on thermoelectricity in various industries. Based on this research background. The paper discusses the related theories of green clothing industry and fashion products under the background of energy resource consumption, and discusses the green design strategies of clothing design. It analyses the thinking patterns of domestic and foreign designers in green clothing design. Guidance on fashion design.

1. Introduction

Since the introduction of the green design concept in the 1980s, it has marked the beginning of human attention to environmental issues. In 1995, the concept of sustainable development was put forward by the CPC Central Committee as an important strategy for national development, and it has been 21 years. The global attention to environmental issues is not only the responsibility of governments and companies, but also the interests of each of us. From the perspective of the product, the design objects of the product include product research, development, display, and publicity. Therefore, the design behaviour has become an overall planning behaviour. In product design, there are many kinds of design styles. To alleviate the pressure of products on the environment, green design is one of the categories, and it is an essential classification system. Clothing, food, clothing, and transportation are the basic living principles of human beings. The most fashionable clothing design is the focus of this study. Fashion, that is, first experimented by a few people in a certain period, and predicted to become a life style admired and imitated by the public. In the application of fashion, the green design of fashion products can promote the green consumption, while alleviating the contradiction between man and nature. Although the environmental problems cannot be solved quickly, but the environmental awareness has been improved to achieve the three of man, nature and society. In terms of harmony, it has guiding significance.

Green design is not just a design style, nor is it just an adjustment of the design method, but a regular measure under the design strategy. It is a sustainable development idea produced under environmental damage. Based on protecting the natural environment, it is conducive to adjusting the industrial structure of enterprises and strengthening people's environmental awareness. The theoretical significance of this subject research: The current status of China's green design theory research is slightly weaker than foreign countries. This article, while enriching theoretical materials, summarizes the scope of application of related fashion products, which is helpful to define the important position of fashion in the field of sustainable development. Practical significance: Through case analysis of dozens of brands at home and abroad, and combing discussions on green design methods and ideas, it has certain guiding significance for developing designers' thinking patterns and planning design behaviours for sustainable design.

2. Application of green design in clothing design and manufacturing

In the period of low industrialization, clothing was mainly divided into two types, one was aristocratic clothing, and the design process was luxurious and complicated. The other is civilian clothing, simple and frugal, and through the transformation of old clothes to follow the trend of the times, there is not much waste. Due to the advancement of the times, mechanized production has begun to replace individual handicrafts, mass production has become possible, and there is a chance that surplus fashion will not be consumed. In the middle of the 19th century, chemical dyes began to flourish. The bright colours dyed by these dyes were popular for a while, but at the same time brought some problems. These dyeing and weaving chemicals can cause environmental pollution such as water, air, soil during the sewage discharge process. It is the inevitable result of the development of economy and science and technology, and it will arouse the contradiction between the fashion industry and the environment. In the 1960s, the "anti-traditional" cultural trend¹⁸ appeared in many western developed countries. They refused fashion and chose to wear vintage blue-collar workers' clothing and second-hand store used clothes. This wearing concept is a manifestation of environmental concerns. While rejecting fashion, they have also led another fashion trend. At the same time, this is the beginning of consumers' pursuit of natural and comfortable environmentally friendly fabrics.

With the development of industrialization and the rapid development of the economy, a fast fashion trend has set off at home and abroad. Fast fashion brands such as ZARA, H & M, and UNIQLO have diverse styles, fast updates, and low prices, which can stimulate consumers' excessive consumption. The production, sales, consumption, and processing of all aspects will have a negative impact on the environment. A series of environmental issues have caused human reflection, and the ecological concept has begun to gain popularity. In fact, the concept of sustainability was first expanded in the fields of management and science and technology, and then developed in the field of design, and has become one of the design methods of the fashion industry. Today, sustainable design has become one of the uncommon styles on the fashion show, and many domestic and foreign brands have begun to explore green design. As shown in Figure 1, it is the application of environmental protection and green design in clothing design and manufacturing.

It Takes 2,700 Liters of Water to Make One Cotton Shirt



Enough Water for One Person to Drink for 2½ Years

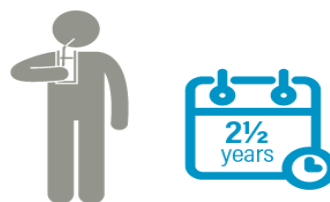


Figure 1. Application of the green idea in clothing design

3. Green Design Application Strategy

3.1. Green Design's Application Strategy in Fashion

3.1.1 Connotation of green design strategy.

The design strategy is to infer the favourable conditions, unfavourable conditions and threats posed by the external environment of the enterprise, then analyse the strengths, weaknesses and implementation strategies of competitors, and comprehensively consider the formulation of

strategies that can win in competition. Therefore, the design strategy is to develop a series of comprehensive and long-term strategies with the purpose of surpassing the opponent to develop itself, with competition for consumers and the market as the main content. Green design strategy is a plan, behavioural policy, etc. to obtain market competitive advantage through product design from an environmental perspective. As the second largest industry for environmental pollution, China is also the world's largest clothing producer. The responsibility it shoulders cannot be ignored. Regardless of green design strategies, designing only meets the aesthetic needs of human beings will cause great harm to the environment. Therefore, researching green design strategies has important guiding significance for guiding design thinking, disseminating green consumption concepts, and promoting green lifestyles [1].

3.1.2 Application of Green Design Strategy in Fashion.

Green design is not just a design style, nor is it just a change in design methods. It is a regularization of design strategies and a sustainable development idea produced under severe environmental pollution. Based on protecting the natural environment, it is conducive to adjusting the industrial structure of enterprises to strengthen people's environmental awareness. Fashion as a product must show innovation in the overall design. Functionally, visually, and perceptually, all aspects affect each other. Fashion design strategy refers to the method designed to improve the competitiveness of clothing brands. It has a guiding and planning role in the design activities of the company, clearly proposes the design direction, guides the designer to carry out green design according to specific goals and thinking methods, and is conducive to the integration of resources during the entire production cycle evaluation process to achieve the clothing sustainable development. Green strategies can increase consumers' awareness of environmental protection, change the behaviour and attitude of green consumption, and realize the harmonious development of people, nature and the environment. As shown in the figure, it is the green design strategy in clothing design.

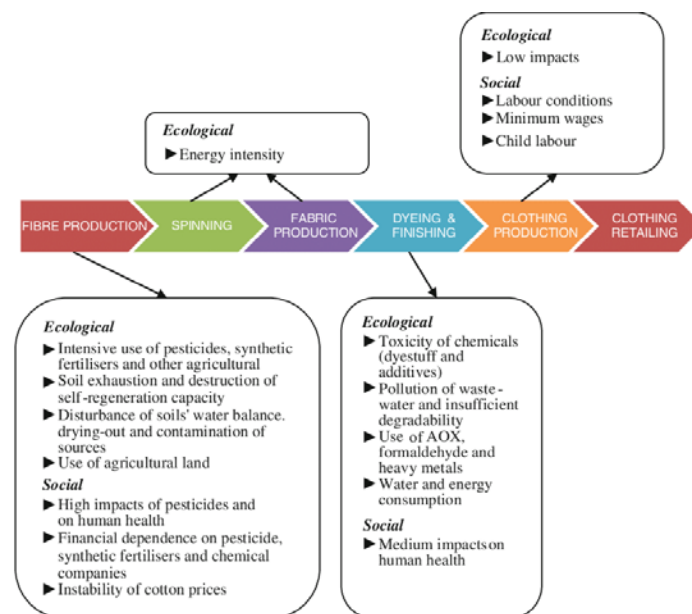


Figure 2. Analysis of green clothing design strategies

3.2. Green Design in the Basic Three Elements of Fashion

Green design is a way of thinking about design that emerged in the 1980s. Nowadays, due to the deterioration of the environment and the shortage of resources, the current design style is becoming more and more popular. Fashion designers at home and abroad have different design approaches to green design, but the main thing is to start from the three elements of clothing. The change and combination of the three elements of fabric, shape and colour constitute a diversified design of fashion styles. Based on the author's investigation and research on the performance of green design

in fashion, 79.35 consumers recognize the use of fabrics. Colour design accounts for 55.92 and style changes account for 44.78, which confirms the importance of green design in these three perspectives. Studying the performance of green design in the three basic elements of clothing can guide designers to use the correct green design thinking to create fashion. Choosing natural non-toxic and harmless or renewable and recyclable fabrics is the basis of design. Similarly, shape and colour are also factoring for designers to consider in green creation.

4. Guidance and suggestions for fashion designers for green design

4.1. Domestic Green Consumption Data Analysis

In the questionnaire survey in this article, I learned about the state of green consumption in China. According to the survey, only 1.62 people did not care about environmental issues at all. More than 60% of consumers will consider environmental protection factors when purchasing fashion consumer goods, but domestic environmentally friendly products are not popular because only 12.99 people know and follow relevant green fashion information. In addition, more than 66% of the population are completely unaware of the current status of the application of green design, but from the perspective of the consumer willingness of consumers, 91.1% of consumers are willing to buy green clothing, and 98.38% of people have a preference for green fashion and a willingness to try, even 63.81% of consumers are willing to pay a higher price for green products, and are willing to try new green application items in recognized brands, and only 1.39 do not care about green consumption. This is a market that promotes better trends for green products.

4.2. Necessity of green consumption in the fashion industry

As an era of mass consumption, fashion consumption has an indispensable role in society while affecting people's perceptions and codes of conduct. It can provide people with a rich material foundation, stimulate consumption, promote economic development, and meet people's individual spiritual needs. At the same time, the novelty and transient characteristics of fashion consumption have caused a certain situation of excessive consumption and excessive waste, which is not conducive to the sustainable development of the environment and should be given some attention and reflection. In addition, by analysing the necessity of green consumption, in order to understand the market in depth, green design can still satisfy consumers' pursuit of fashion, and can change consumers' consumption patterns and attitudes to a certain extent.

Sustainable consumption has been the mainstream trend in the development of international fashion, and it is gradually emerging in China [2]. Consumers should bear corresponding social responsibilities while considering individual interests. Fashion consumption is a social consumption behaviour that determines the level of social and economic development. It is part of social culture and arises under a certain social background. It has different effects on the ecological environment. The factors of environmental degradation are not only the result of production behaviour, but also closely related to human consumption concepts and lifestyles. Consumers are the main body of the market, and changes in consumer behaviour can drive products to increasingly environmentally friendly designs. At the same time, only the production of green products can reduce the waste of resources and energy in the consumption of the entire society and maintain sustainable development. Therefore, guiding consumers to green fashion consumption behaviours, promoting sustainable fashion consumption concepts, changing consumer behaviours and living attitudes, has played a positive role in promoting sustainable development and maintaining ecological balance. Figure 3 shows the green value in clothing design.

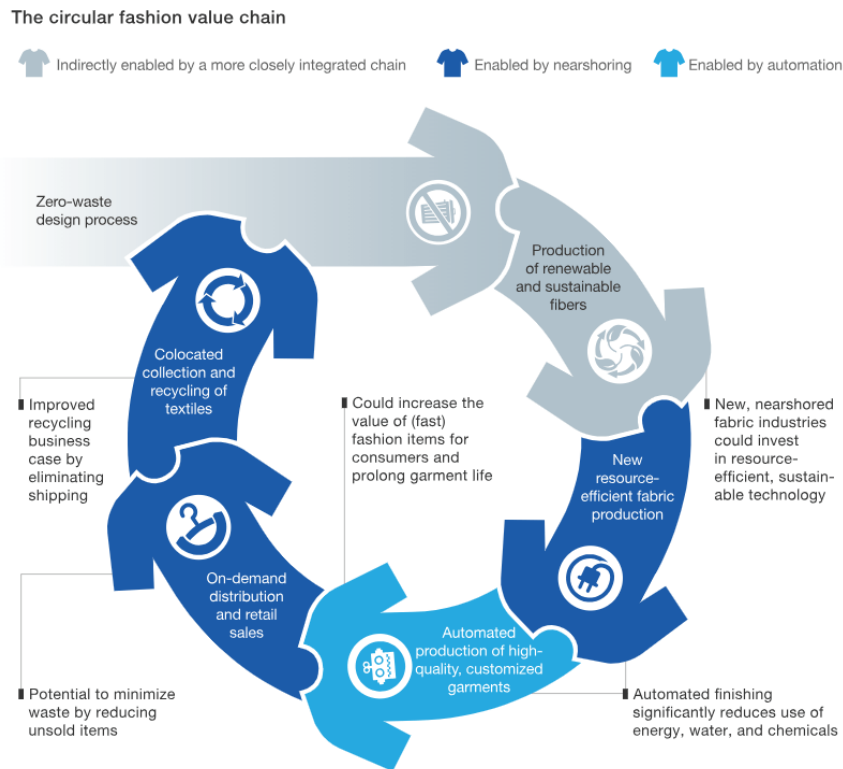


Figure 3. Green Values in Fashion Design

4.3. Domestic Fashion Designers' Guidance and Suggestions on Green Design

4.3.1 Enhance the awareness of green design innovation in product design.

Green design is proposed in the context of the entire society. This is the need of the times. It requires designers to consider not only the functionality and aesthetics of fashion, but also the relationship between environment and needs when designing. It takes environmental factors into consideration, and considers the impact of production, sales, consumption, and processing on the environment. Designers should broaden their horizons and change their concepts. They should not just imitate foreign design shapes, but also consider their application skills in sustainable design. Designers have a direct guiding role in consumer purchasing behaviour. They should actively guide green consumption behaviour, increase consumers' rational consumption awareness, focus on design for environmental protection and sustainable design, and pursue economic benefits while considering Harmonious development with nature. The green design concept of fashion designers includes the following aspects, such as how materials are selected and applied, how styles and colours are designed, process structure design, consumption and maintenance processes, and reuse processing. As a contemporary fashion designer, it is necessary to keep abreast of fashion trends and consciously use the concept of green design. Too much pursuit of the novelty of the form of clothing is not conducive to the harmonious development of the environment. Only by truly achieving environmental protection innovation can we shoulder the corresponding sense of social responsibility [3].

4.3.2 Reasonable selection of materials based on environmental factors.

Choosing healthy and environmentally friendly fabrics is the basis for fashion design. Natural and environmentally friendly fabrics are common in China, such as cotton, linen, wool, and silk fabrics. The use of traditional fabrics is encouraged, such as some handmade fabrics, summer fabrics, and good buckwheat. Although the production is slightly more complicated, it also determines the durable characteristics of the fabric. In addition, some new natural fabrics are extracted from our usual food, tea and other scientifically developed plant fabrics. This is the development and application of a biodegradable material. These fabrics have almost zero

environmental pollution after use. In the case study of the brand in the last chapter, Susan Lee used bacterial fibres to generate fashion, which is the application of this fabric. In 2015, the environmentally-friendly bag company Freitag from Zurich, Switzerland, introduced biodegradable jeans, which is also a new type of environmentally friendly material. This jean uses linen, cotton and linen blends, yarn spinning, and woven fabrics as raw materials. Minimal and no bleaching (Figure 4).

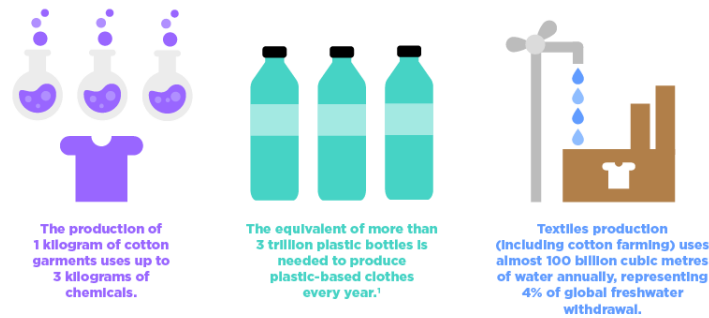


Figure 4. Relevant chemical elements in green clothing design

In addition, the use of recycled materials and recycled materials is also one of the designers' choices. Redesigning based on recycling used fabrics and industrial waste is a kind of recycling of fabrics. In some cases, such as recycling celebrity dresses or catwalk fashion redesigns, or recycling second-hand used clothing to adjust details and resell, they are all re-designed for recycling. Another design method is the re-engineering design supported by green technology, such as fiberizing and remanufacturing discarded fabrics into new fabrics or technically processing garbage waste into new fabrics. Creating fashion is such a green design concept. Of course, the selection of this fabric needs the support of technical conditions [4].

4.3.3. Learn the operation of foreign advanced technology and equipment.

Product green technology innovation is an expansion of the technical field. It is a technological upgrade driven by economic development and a brand-new production method born from the perspective of ecological civilization. Product green technology is an urgent need to maintain ecological balance and harmonious development of the environment. Innovation in the technical field requires the protection of a certain social system. It promotes the promotion of green products and forms a certain social culture under the promotion of the social system. Compared with the traditional production technology in the past, product green technology can reduce the consumption of natural resources, enhance social responsibility, and produce better ecological and economic benefits. Today's society is an era of rapid development of new technology and equipment. The use of science and technology has penetrated all aspects of human life. The concept of sustainable development was put forward, and the application of green technology was also launched. Therefore, making products with less impact on the environment, reducing the degree of pollution to the ecological environment in the production process, sustainable product consumption and post-processing processes, have important practical significance for human social development.

Economically developed western countries have advanced science and technology. Economic development drives technological progress. Technological innovation is also rapid in the fashion industry. Many new environmentally friendly materials require technical support. Only by optimizing product technology can ideas be turned into reality. Taking the development of smart fibre as an example, it has promoted the maturity of 3D technology. This level of technology can avoid the waste of materials in the production process. In early 2016, the architect Shaun Borst rock and the well-known 3D designer Mark Bloomfield jointly developed the Modelled series (Figure 5), which launched wearable 3D printed clothing. This is an innovation in the fashion industry technology. Nylon powder, printed 10 different styles of fashion. At the same time, the shape, size, and colour of the clothing can be customized and redesigned, and the final dressing effect can also

be adjusted [5].



Figure 5. 3D printing series in 2016

5. Conclusion

This article takes "Research and Application of Green Design in Fashion Products" as the topic, and summarizes the relevant theories of green design and fashion products from the current research status at home and abroad. From a theoretical perspective, it summarizes the green design strategies under industrial products and the designs on fabrics, colours, and shapes in fashion products.

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