

ECO-FRIENDLY CLOTHING: HOW TO DESIGN CLOTHES THAT PROTECT THE PLANET

¹Wang, Xin, ²Zhang, Yi, ³Chen, Xiaomei, ⁴Zhao, Qiang, ⁵Sun, Yu
Quanzhou Normal University, Quanzhou, Fujian, China.

Abstract: The concept of environmental protection has been constantly evolving in the past few decades. In the clothing industry, major brands have begun to integrate this concept into their design process. This paper studies how these brands have incorporated environmental protection into their clothing design, and discusses the challenges and opportunities they face.

Keywords: environmental protection, clothing design, sustainable development, major brands, challenges, opportunities

1. Introduction

Human beings has a written history of more than 5,000 years. In the continuous development of history, human civilization and natural environment have been constantly fighting and integrating. Natural environment determines the development direction of regional human society, and human social activities also cause irreversible changes to the natural environment. In order to make the human society and the natural environment better integrated development, the concept of environmental protection is also constantly innovating. The concept of environmental protection refers to a new concept put forward to maintain the sustainable development of the environment in a regional or global scope. Human beings should reduce the impact on the natural environment in various social activities and coexist in harmony with nature.

The concept continues to develop, and then becomes one of the necessary factors to directly drive consumers' consumption activities. In the world, all the major brands have integrated the concept of environmental protection into their own clothing design, and constantly hold various kinds of clothing press conferences to show the environmental protection concept of harmonious coexistence between man and nature. This paper aims to study how the major clothing design companies combine the concept of environmental protection with clothing design, and design a new clothing in line with the concept of environmental protection.

2. A review of environmental protection concepts

2.1. The emergence, development and evolution of environmental protection concepts

Environmental problems are a phenomenon that human beings have been required to face since ancient times. Because the development of social productive forces is gradually improving, so the environmental problems also develop, in different historical stages of the environmental problems are also very different, and in today's society is facing the biggest environmental problem is-environmental pollution.

In order to better improve the quality of life, the life mode based on environmental protection has become a new goal of people's life. Because of the increasing amount of waste in life, the consumption of resources and environmental deterioration, so in order to reduce unnecessary waste, the concept of low carbon and environmental protection has become the mainstream idea in the 21st century^[1](Hu Xiaoqing, 2012).

With the rise of environmental protection heat, environmental protection has become the new favorite of designers. Because the theme of environmental protection is currently the most concerned topic of the public, but also the most sympathetic way to arouse the public. First of all, a variety of topics about conservation and environmental protection frequently appear. Secondly, the major enterprises have also joined in the environmental protection action, playing an important leading role in the environmental protection activities.

In the clothing industry which is closely related to our life, the real reason for the concept of environmental protection and sustainable development into the fashion industry is the outbreak of "fashion pollution protest" incident, which has also attracted wide attention from fashion brands and designers. With the concept of environmental protection, the concept of waste utilization is gradually accepted by more and more people. Such as well-known environmentalists Vivienne Westwood, (Vivienne Westwood) in the spring and summer 2018, the west queen will add waste disposable items to clothing, make clothing in more three-dimensional feeling more reflect the concept of the concept of environmental protection, as well as the use of abandoned disposable water bottles to some models as shoes, fully express the idea of waste use.

"Buy, buy, buy" is a common problem of modern consumers. Due to the psychological impact of impulse consumption, most clothing and related products are abandoned and left idle after using them once or two times, while Vivienne Westwood advocates buying less and buying high-quality products.

2.2. Research status of environmental protection concept

Developed countries led by the United States, such as Sweden, France, The United Kingdom and Japan, took the lead in studying the environmental protection of clothing from the strategic perspective. Looking at the foreign clothing market, a large number of authoritative data on the consumption of environmentally friendly clothing show that the total global green consumption has exceeded us \$300 billion in the last year. 84 percent of the Dutch, about 89 percent of the Americans, and about 90 percent of the Germans consider their environmental standards when buying^[2](Feng Xiaohan, Yang Rongrong, 2011).

Compared with the foreign environmental awareness and environmental protection concept of clothing design, China is relatively indifferent, because in the face of the green consumption wave sweeping the world, most enterprises are lack of sensitivity and practical actions. Among the textile enterprises can carry out ecological textile certification is very few, only a few enterprises and products have been green certification.

3. The application of environmental protection concept in reality

3.1. Practical application of environmental protection concept

3.1.1. LVMH The Group promotes LED lighting and energy-saving cooling equipment

With the rise of environmentalism, the clothing and luxury industries have been questioned from all walks of life, so LVMH, the world's largest luxury group, has devoted itself to environmental protection and taken the responsibility of protecting the environment. According to my data collection, LVMH group's sustainable development plan is increasingly perfect. The LVMH Group has set up a special carbon emission fund to promote LED lighting and energy-efficient air-conditioning equipment and to reduce greenhouse gas emissions in its stores and factories. The group's carbon emissions fund raised 11.3 million euros in 2018 and gradually increased the number of specific environmental measures to 112 from only 64 in 2017. These environmental measures helped LVMH reduce greenhouse gas emissions by 2,500 units in 2018, equivalent to 1,600 European households. In order to increase environmental protection, LVMH, the company put forward an environmental protection initiative with the theme of LIFE LVMH Initiatives for the Environment, and strive to implement environmental protection in every link from procurement to production, from design to retail.

3.1.2. Levi's launches Project F.L. X plan

In the world, 90 percent of clothing consumers have at least a pair of chic jeans. In popular culture, denim clothing is a fully personalized popular element, which spans the global clothing of the gender, age, traditional concepts and other aspects of consumers in different market groups. "As a fashion item recognized by the housing market," jeans "occupy an extremely important place in the fashion circle. Jeans type is the most fashionable category fold and wear effect of pants, for the designer deliberately create "old" effect, to achieve this unique other fashion style, factory before each pair of jeans after twenty recurrence of dehydration grinding, then artificial grinding, after bleaching and coloring to finish a finished product. To make the jeans better visually, the water also adds surfactant to be softness. Now people mouth of jeans on behalf of the "fashion" is actually hundreds of tons of water as a price, according to the People's Daily in 2006, according to information processing plant each production a ton of denim clothing and related products, there will be about 200 tons of water will be polluted, including about 2500 kinds of chemical substances in the sewage, cannot be recycled. Therefore, the famous denim brand Levi's (Levi's) launched the F.L. X plans to improve jeans productivity and environmental protection to replace traditional manual operations through automatic machines and reduce the use of chemical formulas to achieve environmental conservation.

3.1.3. Starbucks launches its first "container store" in Taiwan

Over the years, Starbucks, a global coffee chain giant that has been challenging its unique stores, has begun to explore more different business models to meet the needs of different consumer groups. On September 26, 2018, the first Starbucks container store in Taiwan, Zhuilan Store, was opened in Ji'an Township, Hualien County. It is understood that as the world's first Starbucks café built by abandoned containers, founded in 2012, it is not only conducive to the recycling of waste resources, help protect the environment, but also trigger more creative inspiration. This time, in order to present a better effect, Starbucks specially hired the famous Japanese designer Kengo Kuma to design this "container store". This design is not only beautiful but also more environmentally friendly, so that the recycled containers can be fully utilized. In addition, Starbucks announced in July 2018 that it would eliminate the use of plastic straws in all its 28,000 stores by 2020^[3](Yang Tao, 2020). This is also similar to the use of waste containers to create environmental protection of the store.

3.2. The application of environmental protection concept in clothing

3.2.1. The design and application of environmental protection concept in clothing materials

The famous Magella Fashion House (Maison Margiela) is always unique and elusive in costume design. Designer John Galliano (John Galliano) also like Martin Magilla (Martin Margiela) has the same way of deconstruction and restructuring, making the design look more intriguing. The hat is made only of a transparent raincoat material, while the bag is designed more like a pillow at home. Single tone such as white, gray and other main tone color and with the bright color of men's wear contrast is also quite strong.

As shown in Figure 1.



Figure 1: Maison Margiela Autumn and winter 2018.

In an interview with the British version of ELLE, designer Stella McCartney revealed that she will use environmental awareness to better respond to her clothing brand. In the future, clothing design and production will be used in large quantities, as well as an environmentally friendly flagship store in London, UK. The design of the flagship store to the use of the store permeates the concept of environmental protection, and is known for its environmental friendliness.

3.2.2. The design and application of environmental protection concept in clothing styles

Vivian Westwood (Vivienne Westwood), the representative designer of the top environmentalists in the fashion industry, appeared in the 2018 spring and summer men's fashion show, in order to better express the concept of environmental protection, she used four different poker symbols in life to convey the theme of this season "We Are Mother Fucker". Throughout the show, the Empress Dowager used her flashy expression to show imminent environmental protection in her clothes. The most important element that can reflect environmental protection is that the Empress Dowager holds all kinds of disposable waste in the clothing, and even some models step on disposable mineral water bottles and rope them as shoes. In the autumn and winter fashion show of 2019, the Empress Dowager used a different approach from the spring and summer 2018 fashion show to make an environmental declaration again. In the release of the fall / Winter 2019 collection, the queen added British street style fashion. The series uses asymmetrical silk satin dresses and plaid suits to form a very funny mix and match, constantly appearing on T-shirts and skirts in the form of graffiti prints and slogans, to talk about the environmental problems of the current society.

As shown in Figure 2 and Figure 3.



Figure 2: Vivienne Westwood Spring / Summer, 2018 .



Figure 3: Vivienne Westwood Autumn / Winter 2019.

3.2.3. The design and application of environmental protection concept in clothing color

Stella McCartney (Stella McCartney), who has always focused on sustainability, and famous photographer Harley Weir and artist U rs Fischer have focused on the issue of “waste” and “excessive consumption” in the new advertisement in the fall and winter of 2017.

In the shooting of this advertising blockbuster, the new models and the popular models were dressed in brown and gray clothes to show the city’s failure and pollution caused by garbage pollution, which formed a very strong contrast with the environment full of waste garbage in the shooting. On the other hand, models wearing green dresses with brown gauze, lie in the garbage accumulated by a variety of disposable waste, which can bring people

a strong visual impact and convey the brand's attention to the problem of waste and excessive consumption of resources and the positive attitude.

As shown in Figure 4.



Figure 4: Stella McCartney 2017 Autumn and winter series of advertising.

4. The application of the environmental protection concept in the design

4.1. Inspiration source

This design is related to the current topic is closely related to the environmental protection issues. Because with the continuous expansion of consumption scale, the waste in life is constantly increasing, resulting in serious consumption and deterioration of resources. Therefore, in order to reduce unnecessary waste, the concept of low carbon environmental protection has become the mainstream idea in the 21st century^[1](Hu Xiaoqing, 2012).

Inspired comes from Figure 5

Clothing accessories craft

Theme: Environmental Art

Source of inspiration:

With the increasing scale of consumption, the increasing amount of domestic waste has caused the depletion of resources and the deterioration of the environment. To reduce unnecessary waste, the concept of low-carbon environmental protection has become the mainstream thought in the 21st century



Figure 5: Environmental art design drawing.

4.2. Design philosophy

The reason why people often say that art comes from life, because the inspiration and experience that life gives to the creators are indelible. After being deaf, Beethoven wrote the symphony of fate that shocked the world, and Li Bai created the classic eternal pass into the wine after his exile.

With people's pursuit of high quality of life, environmental protection has become a key topic. The concept of environmental protection has subtly infiltrated into our daily life, and the clothing in line with environmental protection has become a fashion and trend. This design is mainly based on the concept of environmental protection, constantly find the fashion elements from the environmental protection, and through clothing and accessories to convey the concept of environmental protection, the design of environmental protection, fashion as one of the clothing. It is hoped that through such a design, more people will begin to pay attention to environmental protection and devote themselves to environmental protection activities, and contribute their own meager strength to green environmental protection.

The clothing design effect drawing is shown in figure 6:

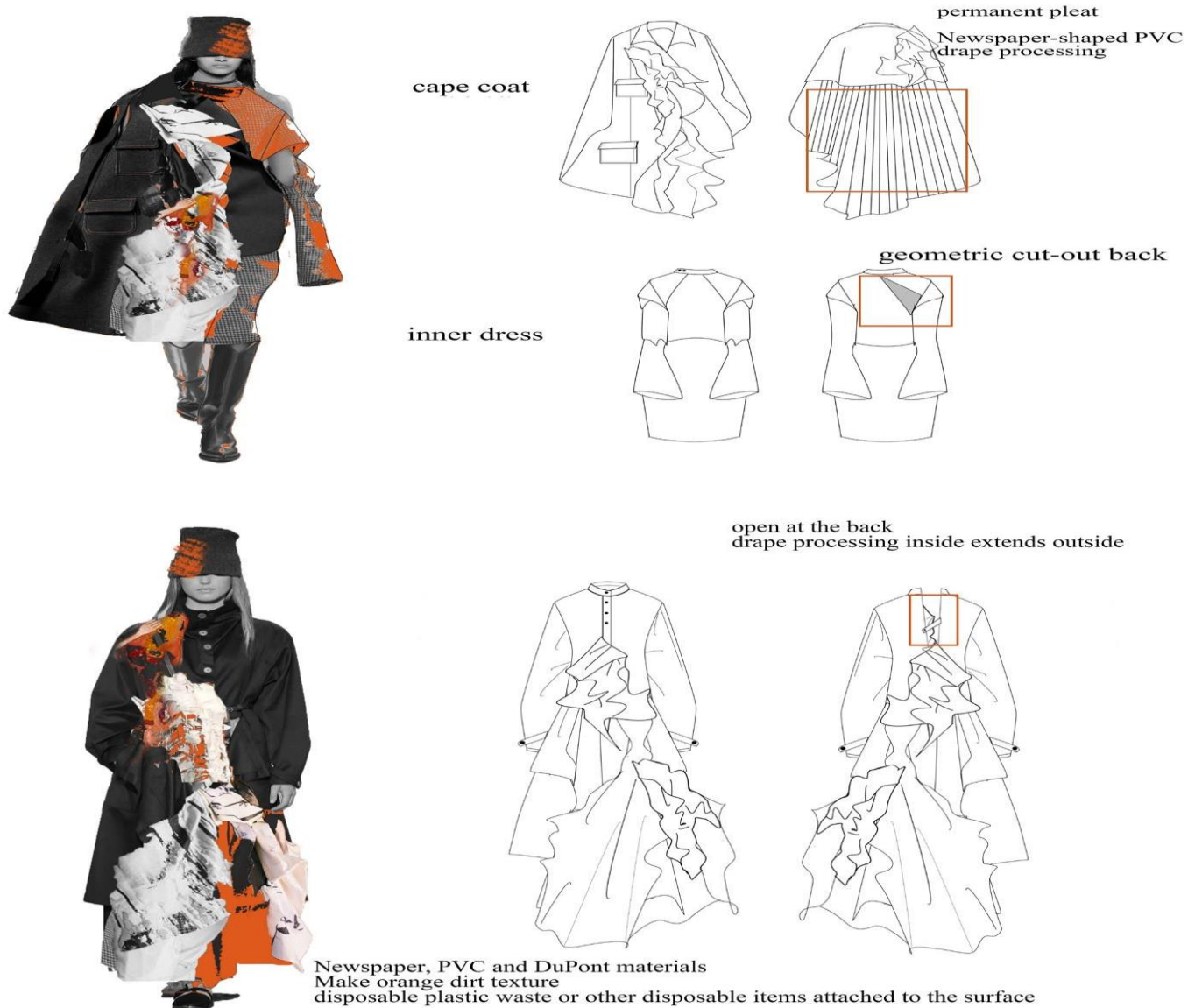


Figure 6: Newspaper PVC and DuPont paper material clothing design drawing

4.3. Fabric selection

4.3.1. Denim fabric

The three main elements of clothing are mainly color, fabric and style. Therefore, clothing fabric is the most important clothing element besides clothing style and color. The choice of clothing fabrics, to a large extent, will determine the final effect of clothing presentation^[4].(Lu Aixiang, 2016).Therefore, the choice of fabrics has become an indispensable part of the clothing production link.

According to the design idea, in the initial fabric selection, the black denim fabric with a relatively stiff material was selected as the primary fabric of the overall clothing. Because the cowboy fabric air permeability is good,

wear comfortable, and thick texture, not easy to deformation. Considering that the fabric should be processed and modified in the later stage, so denim fabric is the first choice of fabric choice.

The rendering of denim clothing fabric is shown in Figure Figure 7:



Figure 7:Denim fabric.

4.3.2. Thousand bird case fabric

In 1948, the elegant Mr.C hristian Dior applied the modified canine tooth pattern on the packaging of the perfume^[5] (Eunice,2019),Therefore, the first time on the fashion stage, and got a new name-thousand bird case. Since then, the qianbird case, which was only used in men's wear, has gradually become popular in women's wear. According to the design idea and referring to the final clothing renderings, the bottom dress in the clothing is made with the fabric of Qianbirds, which forms color contrast with the black denim fabric chosen by the coat.

The rendering of the fabric is shown in Figure Figure 8:



Figure 8: Thousand bird box fabric.

4.3.3. Patent leather fabric

The so-called patent leather fabric, mainly refers to the leather or PU leather leather fabric into the shower paint processing, make its surface more bright and strong, its feature is full leather color, natural, waterproof, not easy

to deformation, easy to take care of. In order to make the visual effect more impact, the black stiff denim fabric of the early primary election was replaced with patent leather fabric. While the color contrast is strong, it also forms a sharp contrast on the material, making the overall visual effect more attractive.

The rendering of patent leather fabric is shown in figure 9:



Figure 9: Patent leather fabric fabric.

4.4. Manufacturing process

4.4.1. Make the style and silhouette

The style of clothing has an important influence on the final effect presentation of clothing, and it can play a role in decorating and beautifying all kinds of body types. If the style of a dress or a dress is too old, the ordinary can not attract people's attention, bringing a strong visual impact to people.

In this design, the basic style of the dress has carried out a second transformation, focusing on the sleeves, waist and shoulders of the transformation and re-creation, and cutting off on both sides of the sleeves to increase the visual impact and sense of hierarchy. And pulling the waist line on the dress can make the curve of the human body more obvious. Creative transformation on the coat shape through some common fabric transformation techniques, will make the environmental protection theme more prominent. And the hollow-out processing is applied in the second set of the back, so the clothing shape is full of hierarchy and more changeable. Finally, the silhouette of the coat is enlarged to increase the sense of volume of the clothing and make it more attractive.

4.4.2. Production of sample clothes

Before making clothes, the production of clothes samples is also an indispensable and important link^[6](Min Yue., 2015).

k. Because often the clothing can not be directly made into the clothing effect diagram, is the need to be constantly changed can be completed. Therefore, the sample clothing of clothing is the best way to modify the clothing, through the production of the sample clothing to see what the style, size and details of the clothing need to be adjusted and changed.

As shown in figure 10 and figure 11:



Figure 10: Sample clothes making drawing front and side.



Figure 11: Sample garment making drawing back and side.

4.4.3. Garment making

The production of ready clothing is particularly important in the creation of the whole design, which is the most intuitive expression technique of clothing renderings. The costume design series of "Environmental Protection Art" adopts the asymmetric decorative effect, and has been created twice in some places, so that the whole clothing has a sense of hierarchy and visual impact, so that the seemingly thin design becomes more full. Fabric transformation, as the name suggests, is to transform the fabric twice on the original basis, to make it more creative and practical^[7](Ma Jian, 2010). Fabric transformation not only needs to have the ornamental value, but also needs to reflect a certain value in the clothing. These two points can be fully reflected in the texture and texture of the fabric.

As the backbone and texture of fabric transformation, it plays a key role in the final product, because it is its visual beauty and expression mode are the way to express the final effect. Dupont paper, retro newspaper printing PVC

and transparent veil fabric is overlapped and folded to express the surface texture in the garment making. And all the production of small texture superposition processes could make the seemingly messy fabrics reflect a certain sense of space, concave and convex feeling, weight and volume. On the above basis, in order to highlight the concept of environmental protection, the acrylic pigment is used to process the clothing, so that the orange acrylic pigment can express stains, increase the visual impact, let people feel the concept of environmental protection more intuitively, and use the fluorescent orange line to lock the clothing edge processing, echoing the orange acrylic pigment.

In order to increase the sense of series, in the later stage of the second set of ready-to-wear production, the fabric used in the first set of ready-to-wear dress is added to the skirt of the second set of clothing, and it is pleated, and the first set of clothing has more sense and continuity of series.

We can see the design concept become more perfect through the two sets of garment effect. Clothing has become more complete through constant attempt and modification processed in the aspect of details from the thin fabric, not rich level, small size and not comfortable neck structure problem at the beginning.

See the pictures as shown in figure 12 and figure 13:



Figure 12: Garment making detail drawing.

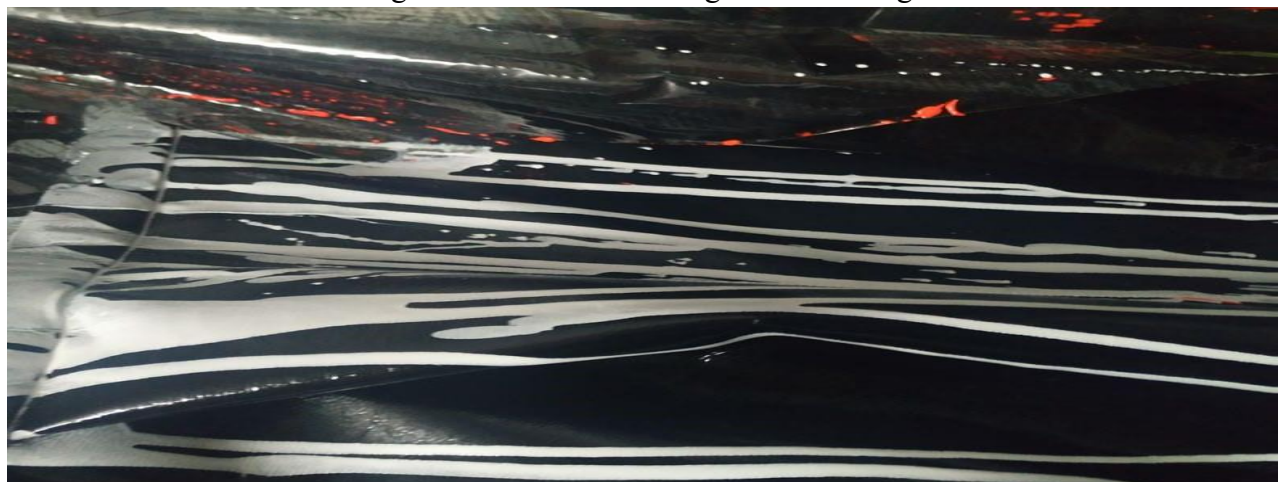


Figure 13: Detail drawing.

5. Conclusions

In the process of environmental protection, clothing design can be said to be the most intuitive means to express, in the face of environmental protection theme display, we have to mention its visual art value. First of all, the design of environmental protection clothing brings us the most direct feeling is the reduction. From the idea of environmental protection that the designer wants to express, we can restore the fact of environmental pollution visually, so that we can arouse the resonance of the public's environmental awareness faster and more directly^[8](Du Ping, 2016). Secondly, the visual experience of garbage pollution or air pollution in the design theme is the main embodiment of designers' creativity.

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