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Cultural Inheritance under the Concept of Sustainable Development: Shaping the Xiangyun Yarn Green Industrial Chain

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Abstract: *With the development of social economy and the highlighting of environmental problems, people's attention to the concept of sustainable development is increasing, and as the intangible cultural heritage of Xiangyun yarn, in-depth research is carried out from the perspective of cultural heritage, sustainable development and the construction of green industrial chain. This paper explores the inheritance dilemma of Xiangyun yarn in contemporary society from the perspective of sustainable development concept, and discusses how to utilize the eco-friendly characteristics of Xiangyun yarn as well as the advantages of cultural inheritance to build the green industrial chain in combination with the concept of sustainable development. This study aims to explore the combination of cultural inheritance and green industrial chain under the concept of sustainable development. The objective is to provide new ideas and references for promoting the development of national traditional culture and the construction of a green industrial chain.*

Keywords: *sustainable development, cultural inheritance, Xiangyun yarn, green industrial chain*

1. Background and significance of the study

1.1. Historical Development and Inheritance Status of Xiangyun Yarn

1.1.1. Historical development

Xiangyun yarn has a 400-year history, originating in the early Ming Dynasty. Due to the impact of war and industrialization, it was almost lost in the 1980s. It was restored gradually in 2003 and was listed in the National Intangible Cultural Heritage List in 2008. In 2011, the Shunde District Government successfully applied for the designation of "Shunde Xiangyun Yarn" as a "Protected National Geographical Indication ". After being designated an Intangible Cultural Heritage, the market for Xiangyun yarn heated up rapidly, and Lunjiao of Shunde became the place where Xiangyun yarn dyeing and finishing techniques was inherited. The fragrance dyeing factories of Lunjiao are springing up. As of 2017, the annual output of Lunjiao Xiangyun yarn is about 2 million, and the products are sold to Hangzhou, Guangzhou and Shenzhen and other important distribution centers.

1.1.2. Current status of transmission

Xiangyun yarn is a kind of coarse linen fabric woven in folklore using traditional weaving techniques. Because of its natural, environmental protection, not easy to fade, rich patterns and other characteristics, loved by people, it not only has a high collection value, but also has a certain medicinal value. At present, the Xiangyun yarn industry has formed relatively complete industrial chain, the products mainly include clothing, home furnishings and travel souvenirs three categories, exported to all over the world. In recent years, with the enhancement of people's awareness of environmental protection and changes in consumer attitudes, Xiangyun yarn gradually into people's lives. Some cultural enthusiasts and government departments are committed to combining the concept of modern social development and market demand, the introduction of more emphasis on green and fashion elements of Xiangyun yarn products, so that Xiangyun yarn can revitalize in contemporary society.

1.2. Overview of the concept of sustainable development and the green industry chain

Sustainable development means meeting current needs without compromising the ability of future generations to meet their needs. It is a development theory and strategy that emphasizes the coordinated

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development of the economy, society, and the environment, with a focus on long-term stability and balance. The goal is to improve and enhance the quality of human life through the protection of natural resources and the environment, while also providing incentives for economic development. This approach represents a new concept of development, ethics, and civilization.

The green industry chain refers to an industrial development model that is oriented towards sustainable development and environmental protection. The model aims to achieve a positive feedback loop of economic growth and environmental protection through initiatives such as renewable energy, resource recycling, the energy conservation, and the emission reduction. The green industrial chain comprises production, processing, and sales links with the goal of reducing negative environmental impact, improving resource efficiency, promoting resource recycling, and reducing pollution. It aims to promote green development, achieve harmonious interaction with nature and society, balance short-term interests with long-term development, and ensure industry sustainability.[2]

2. The Necessity of Developing Green Industrial Chain in the Xiangyun Yarn Industry

2.1. Development Status of China's Green Industrial Chain

China has made significant progress in developing green industrial chains and is becoming an important driver of economic growth. The government has supported the development of green industry chains by introducing policies and regulations on environmental regulation, the energy conservation, and new energy development. These policies aim to encourage and guide enterprises to transform into green industrial chains. Significant progress has been made in the field of clean energy, including wind power and photovoltaic, making it one of the largest renewable energy markets in the world. The development of clean energy provides the fundamental conditions for the green industrial chain. China has shown a strong ability to innovate in the fields of green technology and environmental protection industries. This has led to the emergence of numerous environmental protection science and technology enterprises, which has promoted the development of the green industrial chain. However, China's technical level and innovation capacity in the green industrial chain is still lacking in some areas, particularly in the research and development and application of high-end environmental protection technologies. Additionally, the market mechanism of the green industrial chain requires the further improvement. Furthermore, the development of the green industry chain necessitates significant financial support, and the current lack of financial investment in some areas has constrained its development.

2.2. Current status of the development of the Xiangyun Yarn industry

The road to the inheritance of Xiangyun yarn is not a smooth one, and how to better protect and pass on the intangible culture of Xiangyun yarn is an issue of constant concern to everyone.[1] The production process of Xiangyun yarn is complex and involves several procedures, such as winding, weaving, and dyeing. Skilled craftsmen are required to carry out each step with precision, which makes the process time-consuming, labor-intensive, and expensive. The Xiangyun yarn industry faces a challenge in scaling up production due to the complexity of its production process, which cannot be mechanized and standardized. Additionally, there are limited channels for disseminating Xiangyun yarn, and the development of domestic and international markets has been unsatisfactory. As a national intangible cultural heritage, the development strategy is supported by the state. However, the protection and inheritance policies for Xiangyun yarn are inadequate. This has resulted in a lack of inheritors, as the policies fail to attract contemporary young people.[1]Therefore, this paper explores the development of the green industrial chain of Xiangyun yarn, adhering to the concept of sustainable development, and assists in the inheritance of Xiangyun yarn culture.

2.3. The significance of the sustainable development of Xiangyun Yarn dyeing and finishing techniques

One of the primary objectives of sustainable development is to minimize negative impacts on the environment. However, the use of dyes and chemicals in the dyeing and finishing of Xiangyun yarn can have adverse effects on the environment. Therefore, the development of environmentally friendly dyeing and finishing technologies, as well as the use of low-pollution and low-energy-consumption dyestuffs and chemicals, is crucial. Promoting the use of environmentally friendly dyeing and finishing technologies, such as low-temperature dyeing, water treatment and waste recycling, can reduce water and soil pollution, lower energy consumption and achieve environmental sustainability in Xiangyun yarn

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dyeing and finishing.

The development of sustainable Xiangyun yarn dyeing and finishing techniques can bring new vitality to traditional crafts, combine modern design and technological innovation, promote the development of the Xiangyun yarn industry and cultural heritage, promote environmental protection, and promote sustainable economic growth. The development of efficient, low energy and low cost dyeing and finishing techniques will increase the competitiveness and market share of the Xiangyun yarn industry.

3. The Direction of Shaping the Green Industrial Chain of Xiangyun yarn

3.1. Traditional production process of Xiangyun Yarn

The dyeing and the finishing process of Xiangyun yarn is summarized by the ancients as "three steam, nine boils and eighteen suns", and all the processes are completed manually by the workers, and the quality control is all based on the experience of the "masters". The process is extremely complex, the production time is long, the technical difficulty is great, it is highly dependent on natural conditions, and its output depends on sunlight. (figure 1)

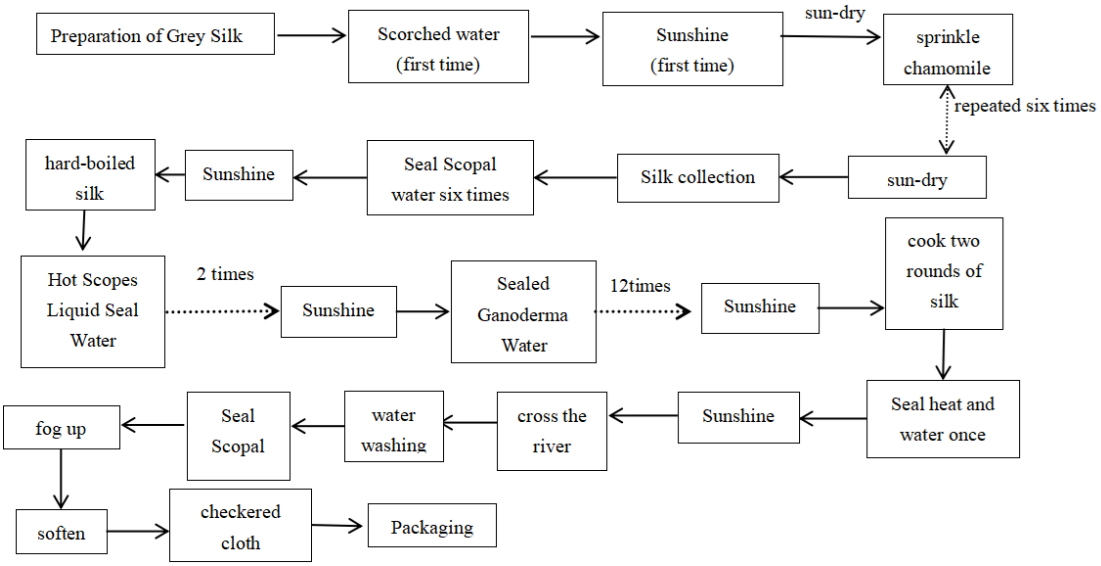

Figure 1: Flow chart of the traditional production of Xiangyun yarn

3.2. Difficulties faced by the production of Xiangyun Yarn

3.2.1. Limitations of natural conditions

With the development of economy, the speed of urbanization accelerated, transportation, residential, commercial land area demand has also greatly increased.[3] The three main raw materials of Xiangyun yarn potato dye yam, mulberry silk, special river mud, dye yam growing environment, mulberry silk agricultural cultivation, the quality of the quality of mud in river water, the production of the production of Xiangyun yarn has very high requirements, but the gradual spread of urbanization, people's the ecological environment have caused varying degrees of destruction. In addition to the dyeing process, other factors such as sunlight, temperature, time constraints, and site requirements also presented challenges to the quality and production of Xiangyun yarn.[3]

3.2.2. Difficulties in the social environment

① Lack of technical personnel; The technical personnel includes scientific research and innovation as well as technical craftsmen.[3] Scientific research and innovation refer to the improvement and innovation in the unique dyeing and drying method of Xiangyun yarn, as well as the innovative design of the products. Technical craftsmen are skilled masters with rich experience who judges the dyeing and drying of Xiangyun yarn through their expertise. It is important to note that subjective evaluations should be excluded unless clearly marked as such. However, training a technical craftsman requires at least 7 to 8 years, and the production process demands high labor and physical strength. These factors discourage

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many young people from pursuing this career path. In addition, the salary is also low, resulting in the Xiangyun yarn inheritors are decreasing.

② The imperfection of the government's protection policy; After Xiangyun yarn was designated as a non-heritage site, the industry received little support apart from tens of thousands of dollars in annual subsidies. Additionally, the local government neglected the subsequent protection and development of Xiangyun yarn after successfully bidding for its heritage.

3.2.3. Fierce market competition

Man-made fibers and synthetic textiles are increasingly replacing traditional silk products. These alternatives are typically less expensive, faster to produce, and offer a wider range of designs. The production process of Xiangyun yarn is more laborious, which makes it face competition from synthetic textiles in the market. In the Xiangyun yarn market, some well-known brands hold a strong market share and brand influence, as well as stable production and sales channels. However, for Xiangyun yarn brands, they must compete with these established brands through innovative design, quality assurance, and marketing. Furthermore, silk products from other countries that produce silk have also entered the Chinese market, resulting in a competitive landscape both domestically and internationally.

As consumer tastes and lifestyles evolve, so does the market demand for Xiangyun yarn. Consumers are increasingly demanding product quality, design style, functionality and environmental sustainability. The Xiangyun yarn industry should adapt its product strategy and the production direction to meet changing market demands to remain competitive.

4. Xiangyun Yarn Green Industrial Chain Promoting Green Economy

4.1. Linkages between the green economy and the green industrial chain

The green economy are an economic model oriented towards sustainable development that emphasizes the coordinated development of economic activities and environmental protection. This economic model intends to promote a mutually beneficial outcome between economic growth and environmental protection by encouraging the efficient use of resources, reducing environmental pollution, and promoting clean energy. The essence of a green economy is to prioritize environmental protection and the resource conservation during economic development. It emphasizes environmentally friendly practices in all stages of production, distribution, and consumption to minimize negative impacts on the environment. There is a close relationship between the green economy and the green industrial chain, with mutual promotion and common development between the two. The green economy advocate for the efficient utilization of resources, environmental protection, and low-carbon development. The construction of a green industrial chain is designed to achieve these goals. In the green industrial chain, it is not only required to adopt clean production technology and efficient utilization of resources in the production process, but also to reduce the negative impact on the environment in all aspects of product design, production, transportation, sales and services. The development of the green industrial chain can promote economic growth, create employment opportunities, and contribute to the sustainable development of the economy. Additionally, it can reduce resource consumption and environmental pollution.

Thus, the green economy and the green industrial chain complements each other, providing important support for sustainable economic development, ecological protection, and environmental preservation. The close relationship between the two reflects the balanced advancement of environmental protection and resource utilization, alongside economic growth and social development.

4.2. Specific construction of green industrial chain of Xiangyun Yarn

4.2.1. Green production

Xiangyun yarn is usually made from natural fibers such as silk and cotton. These natural fibers are renewable and biodegradable. Their production process is often more environmentally friendly than that of synthetic fibers, reducing dependence on fossil fuels and contributing to a more sustainable supply chain. Xiangyun yarn is traditionally produced through hand weaving or on traditional looms. Green production methods reduce energy and water consumption, as well as environmental pollution, compared to large-scale industrial production.

The dyeing and the finishing process of Xiangyun yarn technology relies on three primary raw

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materials: blank silk, the dye yam , and river mud. Grey silk is mainly made of silk as raw material, and its blank source can be utilized to other natural fiber fabrics, such as power spinning, etc. The main components of yam dye yam are starch, cellulose, and tannin, which are natural dyes. The dye emission is low, making it a suitable option for dyeing. Dye yam can be made into a dye after juicing and boiling it in water. Dye yam water can be used to irrigate farmland, while the dregs left over after juicing can be used as fuel to provide energy. Provide energy, fuel combustibility is good, burning time is long, burning smoke will not cause pollution to the air. In general, the utilization rate of dye yam in the Xiangyun yarn dyeing and finishing technology is high. River mud is a natural and non-polluting raw material, through the tools in the appropriate section of the river for extraction, in the over Wu and then washed into the river can continue to use and will not produce any harmful substances, not only recycling of raw materials of river mud, but also the protection of rivers. It not only recycles the raw material of river mud, but also protects the river.

The moisture return rate of the blank is greater than that of the refined silk and the rate of water absorption on the surface is greatly increased, and the difference in air permeability is not great, so the Xiangyun yarn also has the function of quick drying, permeability and comfort, as well as repetitive drying after soaking in dye yam juice plus the coating on the river mud medium dyeing for the blank silk increases the abrasion resistance and tensile strength, so that the service life of the Xiangyun yarn apparel and related products is increased. Furthermore, the dye yam has the function of deodorizing, sterilizing, and mildew-proofing. Tannin components and river mud iron ions can react to effectively prevent ultraviolet radiation, slowing down skin aging and preventing cancer. Finally, the material composition consists mainly of silk and other protein fibers. Microbial degradation is a factor in the material's easy degradation, making recycling difficult. Instead, old and damaged Xiangyun yarn can be crushed and subjected to chemical reactions, polymerization, and other steps to create new fabrics. The sustainable use of products can be achieved by repairing and processing them to create new products. Additionally, the potato scum mentioned above can be used as a renewable fuel source that produces heat without any exhaust gas or pollution. In the production process, the use of environmentally friendly dyeing processes can reduce water consumption and minimize the release of harmful chemicals into the environment. For instance, using water-based or vegetable dyes instead of traditional chemical dyes can help protect water resources and the environment.

4.2.2. Green circulation

Green circulation refers to the focus on environmental protection and the energy conservation in the circulation of commodities. This involves optimizing logistics and transportation methods, promoting green logistics technology, and reducing energy consumption and pollutant emissions in the transportation process. The transportation of Xiangyun yarn products requires the use of advanced logistics technology to plan and implement logistics activities such as transportation, warehousing, loading and unloading, circulation processing, packaging, distribution and other processes. Fuel consumption and exhaust emissions during transportation is major contributors to environmental pollution resulting from logistics activities. To create green logistics, the first step is to plan and layout the transportation line. This can be achieved by shortening transportation routes, improving vehicle loading rates, and implementing other energy-saving measures. Additionally, when warehousing Xiangyun yarn products, it is important to choose a site that cost-effective for transportation. On the other hand, the warehouse layout should be designed scientifically to fully utilize the warehouse and achieve maximum use of storage space, thereby reducing warehousing costs. Xiangyun yarn is located in Foshan Lunjiao and is involved in the production of Xiangyun yarn from upstream blank yarn raw materials and dyes to downstream product sales. This location reduces the number of parts in the industry chain between warehousing and transportation, resulting in reduced transportation emissions of pollutant gases. Finally, waste is collected, classified, processed, packaged, handled, and stored according to the specific needs before being sent to the designated treatment site for further processing. The entire process of circulating the incense Xiangyun yarn product is environmentally friendly, following the principles of environmental protection and the energy conservation, and promoting the development of a green economy.(figure 2)

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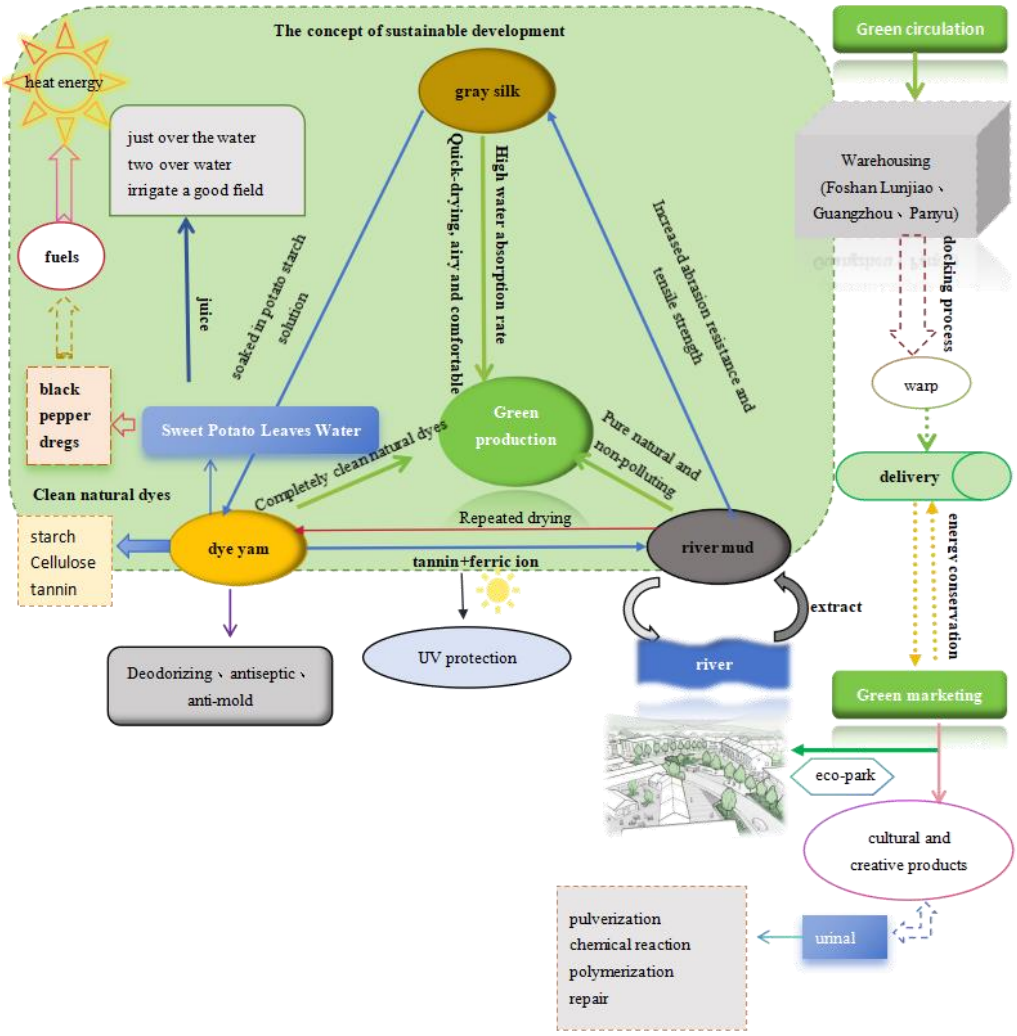

Figure 2: Green production diagram of Xiangyun yarn

4.2.3. Green marketing

With the increasing environmental awareness of consumers and the rise of cultural products, the marketing of Xiangyun yarn is facing new challenges. Combining the concepts of sustainable development and green design, and integrating Xiangyun yarn into cultural products and eco-park tourism can create new business opportunities for the Xiangyun yarn market.

Xiangyun yarn can serve as a raw material for cultural and creative products. By combining green design concepts with local cultural characteristics and historical heritage, we can create unique cultural products that reflect the region's distinct flavor. For instance, it can be fashioned into clothing, handicrafts, and gifts using traditional local styles, but with a modern and fashionable design to meet the aesthetic preferences of contemporary consumers. This not only revitalizes Xiangyun yarn but also expands the market for traditional handicrafts. Additionally, promote and apply Xiangyun yarn cultural and creative products to enhance the tourism experience of ecological parks. Eco-park is characterized by the natural environment, which not only provides a place to display Xiangyun yarn cultural and creative products, but also provides an opportunity for tourists to learn about Xiangyun yarn. For instance, the eco-park could be established in the exhibition hall. Various exhibitions and cultural and artistic exchange activities could be organized to enhance the popularity and influence of Xiangyun yarn in the market. Additionally, a workshop could be set up to allow tourists to experience the production process of Xiangyun yarn and participate in it. This would not only reduce the consumption of excess resources such as packaging and other commodities but also enhance consumer understanding and experience of Xiangyun yarn. To enhance the consumers' understanding and experience of Xiangyun yarn, it is important to avoid unnecessary resource consumption, such as excessive packaging of goods.

Xiangyun yarn combines cultural inheritance and modern innovation through eco-park tourism, guided by the principles of sustainable development and green design. This not only revitalizes

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traditional handicrafts but also expands the scope for the development of Xiangyun yarn's green industrial chain, contributing to the prosperity and growth of the cultural industry.

4.2.4. Green finance

Xiangyun yarn, recognized as an intangible cultural heritage, has been gradually integrated into the modern economic system. Green finance plays a crucial supporting role in this process. It is a financial model that has emerged in recent years, with the core concept of promoting the organic combination of economic development and environmental protection. The Xiangyun yarn industry aims to establish a green financial system that guides funds towards environmental protection and clean technology. This system encourages green investment and financing, provides renewable energy loans, resources, and environmental mortgages to enterprises, and helps reduce energy costs. The ultimate goal is to promote the production of green, low-carbon Xiangyun yarn products and achieve sustainable development. At the same time, the government should increase economic support for the Xiangyun yarn industry's green transformation and technological innovation. This can be achieved through the introduction of tax incentives, the establishment of special funds, and other means to encourage enterprises. Enterprises should focus on talent cultivation by providing technical training and education for practitioners. They should cultivate a group of individuals who understand the concept of green design, are familiar with environmental protection standards, and have an international vision. This will provide strong talent support for the sustainable development of the Xiangyun yarn industry.

5. Conclusions and outlook

Through the research of this paper, it can be seen that the production, circulation, sales and other links in the green industrial chain of Xiangyun yarn follows the concept of sustainable development, adopt clean production technology, realize the efficient use of resources, contribute to the development of green economy, and at the same time set an example for the inheritance of other cultural heritages, and in the future, the green industrial chain has become an important trend in the future development of Xiangyun yarn. In this process, enterprises must actively embrace new technologies, materials, and techniques, continuously innovate and improve to meet market and consumer demand, improve innovation and competitiveness, seize market opportunities, expand diversified sales channels, and build Xiangyun yarn into a brand with international competitiveness. The company should adhere to the spirit of inheritance and carry forward the spirit of non-heritage culture.

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References

[1] Xu Wanping. Research on the Inheritance and Innovation of Contemporary Xiangyun yarn [D]. Qingdao University, 2021.DOI:10.27262/d.cnki.gqdau.2021.000880.
[2] Teng Yongbo. Research on the construction and application of green industrial chain model of underground metal mines [D]. China University of Geosciences (Beijing), 2017.
[3] Wu Heqing. Reflections on the Path of Sustainable Development of Xiangyun Yarn Dyeing and Finishing Techniques in Foshan, Guangdong [D]. Sichuan Academy of Fine Arts, 2019.