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## The Local Wisdom of Jingdezhen Ceramic Craft

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### Abstract

*This paper is from Zhang Lin's doctoral thesis, Chapter Three of "Contemporary Ceramic Art Creation with Buddhist Symbols: Local Wisdom and Ceramic development in Jingdezhen. "Jingdezhen is a famous ceramic capital in China, and the development of Jingdezhen ceramics cannot be separated from the influence of local wisdom. The local wisdom of Jingdezhen in ceramics is mainly manifested in adapting to local conditions, embracing all rivers, and being brave in innovation, actively promoting the prosperity and development of Jingdezhen ceramics. The traditional ceramic craftsmanship of Jingdezhen has distinct characteristics, fully reflecting the wisdom of Jingdezhen ceramic craftsmen. Contemporary ceramic craftsmanship in Jingdezhen has innovated and transformed on the basis of tradition, taking a new path of ceramic cultural creativity and green environmental protection, and deriving new local wisdom.*

**Keywords:** *Jingdezhen, Ceramic Craft, Local Wisdom*

### Research Background

Jingdezhen, located in the northeastern part of Jiangxi Province, China, is globally renowned as the "ceramic Capital of the World." It has thrived for millennia primarily due to its singular ceramic industry, which continues to burn brightly today. Present-day Jingdezhen still holds a unique charm in the field of ceramics. Ceramic experts and scholars from around the world have long been intrigued by Jingdezhen's ability to sustain a prosperous ceramic industry for centuries, as well as the exquisite ceramic products and craftsmanship techniques it has produced over the millennia. The excellence of Jingdezhen's ceramic craftsmanship can be attributed not only to its inherent advantages but also to the local wisdom ingrained in the region. The purpose of this study is to conduct a comprehensive analysis of ceramic craftsmanship, building upon an examination of the development of traditional and contemporary ceramic techniques in Jingdezhen. We aim to investigate the factors and mechanisms behind this development. This paper seeks to provide an in-depth and comprehensive examination of Jingdezhen ceramic craftsmanship from the perspective of local wisdom.

### Research Objectives

1. Analyze the influence of local wisdom in Jingdezhen on ceramics.
2. Analyze traditional and contemporary ceramic craftsmanship in Jingdezhen and the wisdom embedded within it.

### Research Methodology

The purpose of this study is to gain insights into the history and unique techniques of ceramic

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production in Jingdezhen, China, through interactions with historical experts in Jingdezhen ceramics. Initial literature analysis reveals that Jingdezhen's local wisdom can unveil innovative elements hidden within traditional craftsmanship. This local wisdom may encompass ancient craft techniques, material utilization, and more, offering inspiration and a foundation for innovation and development in the modern ceramic industry.

The ceramic industry has long been a cornerstone of Jingdezhen's economy, and researching local wisdom can enhance the value of products, drive Jingdezhen ceramics into high-end markets, and stimulate local economic development. Concurrently, traditional ceramic production is often associated with resource consumption and environmental impact. By studying local wisdom, we can explore more environmentally friendly and sustainable production methods, reducing adverse environmental effects.

## **Literature Review**

From a historical perspective, Jingdezhen has been a traditional ceramic production center in China with a deep cultural heritage in ceramics. The ceramic craftsmanship in Jingdezhen has been passed down and developed over time, giving rise to a contemporary Jingdezhen ceramic culture that reflects the spirit of the era. Relevant literature includes the history of Jingdezhen ceramic development and the contemporary evolution of ceramic production in Jingdezhen.

Jingdezhen ceramics have garnered widespread attention and recognition for their unique artistic style. Within the literature, one can explore different types of Jingdezhen ceramics and their artistic characteristics, such as Jingdezhen blue and white ceramic, Jingdezhen famille-rose ceramic, among others. Additionally, the works of various artists in the field can also be found in the literature.

Building upon traditional craftsmanship, Jingdezhen ceramics have continuously undergone technological innovation, embracing new techniques and trends, resulting in a contemporary ceramic art form. Relevant literature encompasses topics like innovation in Jingdezhen ceramic craftsmanship and the digitization of ceramic technology. Jingdezhen ceramics not only serve as works of art but also carry rich cultural connotations. The literature sheds light on the cultural significance of Jingdezhen ceramic works, including the incorporation of traditional cultural elements and their reflection of contemporary societal issues.

In conclusion, a comprehensive literature review of contemporary ceramics in Jingdezhen, China, can provide multifaceted insights, deepening our understanding of this important category of contemporary art. Jingdezhen ceramics, as a traditional Chinese ceramic craft, have played a significant role in the development of ceramic art. Within the decorative patterns of ceramic pieces, Chinese Buddhist elements are often used, serving both as decorative motifs and carrying religious and cultural significance.

## **Influence of Local Wisdom on Ceramics in Jingdezhen**

**The Impact of Local Wisdom in Jingdezhen on Ceramics** Since ancient times, Jingdezhen has been globally renowned as the "ceramic Capital of the World," with the ceramic industry consistently serving as its most crucial economic pillar.

The people of Jingdezhen have relied on local wisdom to create exquisite and unparalleled ceramic products. An overview of the Jingdezhen ceramic industry is presented in Table 1 below. Local wisdom in Jingdezhen plays a decisive role in the development of ceramics.

Aspect	Description or Data
Historical Significance	- Year of Establishment: 1004 AD
	- Preservation and innovation of traditional ceramic production techniques
Industry Scale	- Number of ceramic enterprises: Approx. 1000
	- Workforce: Approx. 200,000
	- Annual output value: Billions of USD
Product Variety	- Porcelain, ceramic tiles, ceramic crafts, etc.
	- Traditional techniques like high-temperature porcelain and underglaze color
Technological Innovation	- Application of ceramic 3D printing technology
	- Research in ceramic nanomaterials
	- Digital design and production
Geographical Location	- Located in Jiangxi Province, China
	- Proximity to the Yangtze River and Gan River
Cultural Heritage	- National-level Intangible Cultural Heritage: Jingdezhen ceramic production techniques
	- Ceramic museums and ceramic art schools
Environmental Sustainability	- Environmental protection measures in ceramic production
	- Ceramic recycling and reuse
	- Promotion of sustainable ceramic materials
Domestic and International Markets	- Major export markets: Asia, Europe, North America, etc.
	- Domestic demand in China
	- International influence of Jingdezhen ceramic culture
Industry Support Policies	- Local government support policies
	- Funding support for technology research and innovation
	- Development of ceramic industry parks

### Promote the development of ceramics according to local advantages

The ceramic industry is the core of Jingdezhen's economic and cultural identity, and Jingdezhen benefits from highly favorable natural conditions for developing its ceramic industry. Traditionally, Jingdezhen's advantageous environment for ceramic production has been described succinctly as "water and soil suitable for ceramics"<sup>3</sup>.

While these favorable natural conditions laid the foundation for the rise of the ceramic industry, it should be noted that its growth was not automatic. The people of Jingdezhen relied on intelligence and wisdom, employing various methods to fully harness these advantageous natural conditions, leading the ceramic industry from its inception to prosperity, ultimately establishing Jingdezhen as a renowned ceramic capital.

<sup>3</sup> Jingdezhen Municipal People's Government. The Complete Collection of Jingdezhen Ceramics. Beijing: China News Publishing House, 2000:1



**Figure 1** Changjiang River in Jingdezhen (selfie)

Geographically, Jingdezhen is situated in the Changjiang River basin, characterized by hilly terrain in the southern hills, interspersed with small basins and plains formed by river alluvial deposits. The elevation is not particularly high, but the landscape is undulating. During the Song Dynasty and earlier, the residents of Jingdezhen, capitalizing on the hilly topography, constructed dragon kilns. These kilns had a distinctive design, with one end higher than the other, resembling a dragon, and played a crucial role in the flourishing of ceramic production in Jingdezhen during the Song Dynasty.

Jingdezhen lies in a subtropical monsoon climate zone with distinct seasons, generally warm and humid. Precipitation is abundant, and the area has a well-developed network of rivers, with the Changjiang River being the main river. There are also tributaries like the Nan River, Xi River, and Bei River (Figure 1). Historically, the hilly terrain of Jingdezhen limited land-based transportation options. However, the people of Jingdezhen effectively utilized the Changjiang River system for transporting ceramic products, as well as ceramic raw materials and fuel, via waterways. Sailboats were predominantly used for this purpose in the past, allowing ceramic-laden vessels to flow downstream through the Changjiang River system into Poyang Lake and further into the Yangtze River, ultimately reaching various destinations within China and around the world, resolving transportation challenges. In the early years of the People's Republic of China, more convenient motorized sailboats were also employed for transportation. It was only in the 1980s that road and rail transportation began to dominate, leading to the gradual decline of Changjiang River shipping as a mode of transportation.

Apart from water transport, the industrious people of Jingdezhen also constructed numerous flagstone roads in the hilly areas for overland transportation. These flagstone roads facilitated land-based transportation, allowing goods to be transported via single-wheel carts to nearby areas. Some of these flagstone roads, such as those in the Yaoli region of Jingdezhen, remain relatively intact today and are part of the "Hui Rao Ancient Road." Additionally, Jingdezhen residents built numerous water-powered stamp mills for crushing ceramic raw materials in the mountainous regions. These stamp mills, powered by hydraulic force from the abundant streams and creeks in Jingdezhen's hills, ensured the processing of ceramic raw materials.



Furthermore, Jingdezhen residents made use of creek waters for washing and processing raw materials, as the copious flow of creek waters amply satisfied the water needs of ceramic production.

The forest cover area in Jingdezhen is wide, covering more than 56%. There are many kinds of trees, the most abundant of which is the masson pine. Jingdezhen used to burn ceramic products in the way of wood burning, and the main burning fuel is the trunk of the most widely distributed masson pine, making full use of the forest resources in the territory. In order to save forest resources, Jingdezhen people also use pine branches, Wolf thorn grass and other ceramics, such ceramic kiln is called Cha kiln. The people of Jingdezhen also made full use of pine, Chinese fir, camphor wood and other building materials used as ceramic workshops to solve the problem of building beams. The people of Jingdezhen also used wolfthorn as an important raw material for burning ceramic ash glaze, and the ash of Wolfthorn after burning was used as an important additive for glazing.



**Figure 2** Gaoling Village, Jingdezhen

Jingdezhen is also rich in mineral resources. Historically, Jingdezhen once had a huge amount of kaolin, ceramic stone and other mineral resources. The two kinds of resources, kaolin and ceramic stone, are the main raw materials of Jingdezhen ceramic production, the quality is very superior, and are the important foundation of Jingdezhen ceramic industry in history. In the Song Dynasty, the people of Jingdezhen were able to make exquisite ceramic using only ceramic stone, which was called the "one-yuan formula". At the end of the Song Dynasty, the reserves of high-quality ceramic stone minerals in Jingdezhen were not much, and the wise people of Jingdezhen discovered kaolin in Gaolin village, Fuliang County (Figure 2). By adding kaolin to the ceramic stone, more high-quality ceramic products were produced, which further promoted the development of Jingdezhen ceramic industry. Jingdezhen is also rich in limestone deposits, which is also one of the important raw materials for making ceramic glazes. Therefore, in the past, Jingdezhen can meet the needs of ceramic glaze only by relying on its own mineral resources.

### **Summarize the experience of ceramic production in different places to promote local ceramic innovation**

The ceramic industry in Jingdezhen has never been a closed and self-sufficient system. In the treatment of foreign talents and foreign technologies, the people of Jingdezhen have always adopted a positive, open and inclusive attitude, drawing on the strengths of others and embracing all rivers, which is also the successful experience of Jingdezhen ceramics, fully reflecting the local wisdom of Jingdezhen (Safan, 2021).

As early as the Yuan Dynasty, affected by the war, ceramic kiln workers in the north began to move south into Jingdezhen. These ceramic artisans from the north brought the ceramic skills of the north and promoted the development of Jingdezhen's ceramic industry. In the Song Dynasty, Jingdezhen only had a single blue-white ceramic, but no painted ceramics. It was the arrival of northern artisans that made painted ceramic appear in Jingdezhen. Northern artisans brought red and green ceramic and other painted ceramic techniques to Jingdezhen. For example, the craftsmen from the Baiyi Kiln in Shanxi in the Yuan Dynasty brought the local red and green color ceramic, which became the beginning of the development of Jingdezhen glaze color ceramic. The emergence of blue and white ceramic in the Yuan Dynasty of Jingdezhen is also believed to be closely related to the ceramic painting artists from the north. It may be that the craftsmen of Cizhou Kiln in the north arrived in Jingdezhen and burned the blue and white ceramic in Jingdezhen by using their own painting skills and using imported hemp and green materials.



**Figure 3** Jingdezhen Royal Kiln Factory

During the Ming and Qing Dynasties, the imperial Court set up a kiln factory in Jingdezhen (Figure 3). The imperial kiln factory concentrated the best ceramic artisans in the country, attracting more foreign ceramic artisans to Jingdezhen, not only for the production of imperial ceramics, but also the production of a huge amount of ceramic kiln, the production of fine ceramic products sold to China and the world, the so-called "craftsmen come to eight, the world to go." More and more ceramic artisans come to Jingdezhen, and even far exceed the number of local ceramic artisans, therefore, in this sense, the prosperity of Jingdezhen ceramic industry not only reflects the local wisdom, in fact, is "the world's famous kiln success", is the crystallization of the wisdom of the Chinese people.

Although there are many foreign artisans in Jingdezhen, they live in harmony and jointly create the myth of Jingdezhen's ceramic industry. In the past, Jingdezhen craftsmen were not scattered, but according to the cadastral division into various gangs, mainly divided into three gangs, one is Du gang, that is, Duchang people, the second is Hui gang, that is, Huizhou people, the third is miscellaneous gang, that is, other cadastral people composed of gangs. These trade groups usually have a detailed division of labor, and each has a certain process in the ceramic industry.

It is the cooperation of various trade groups and sincere cooperation that has created the brilliance of Jingdezhen ceramic industry in history. Not only in the past, even now, Jingdezhen still welcomes artists and other people from all over the world with a broad mind, and affectionately calls these foreign talents "Jingpiao" (people from other places or even from foreign countries who come to Jingdezhen, China, to work on ceramics). "Jing Piao" came to Jingdezhen with a feeling of being at home, they brought their own art or ceramic craft expertise to Jingdezhen, and integrated with the traditional ceramic craft of Jingdezhen, making Jingdezhen ceramic craft stronger and more prosperous.

It is precisely because from ancient times to today, the people of Jingdezhen have not stood still, with a broad mind to accept and introduce foreign talents, so that Jingdezhen's ceramic industry has been injected with fresh water, so that Jingdezhen's ceramic industry has maintained vitality for more than one thousand years.

Throughout the development of Jingdezhen ceramics, the Song Dynasty showed a distinct Jingdezhen characteristic, and to the Ming and Qing dynasties, not only Jingdezhen local traditional ceramics are still prosperous, but also absorb ceramic skills from all over the country, all kinds of ceramic skills in the north and south can be found in Jingdezhen ceramics, it can be said that it has truly achieved the "collection of the world famous kiln." The reason why we can do this is inseparable from the humanistic wisdom of Jingdezhen that embraces all rivers and oceans (STAECK et al., 2022).

### **Follow the development of the world era to promote the charm of Jingdezhen ceramics**

Jingdezhen is located in the hilly region of South China, surrounded by mountains. In the past, transportation was very inconvenient and it was located in an inland closed area with few information sources. However, although Jingdezhen does not have location advantages, it does not become a closed and conservative place. On the contrary, the people of Jingdezhen have the courage to innovate and change, actively learn from and integrate into foreign things, and follow the pace of development of The Times, fully reflecting the creative thinking wisdom of Jingdezhen people, which has become an important factor in the development of Jingdezhen ceramic industry. From the archaeological findings, Jingdezhen ceramic was first produced in the Tang Dynasty and the Five Dynasties.

Although the Jingdezhen ceramic industry in this period is still in the initial stage of "farming and Tao Yan", it has already reflected a strong innovation ability. Jingdezhen in the Tang and Five Dynasties mainly produced two kinds of products, one is celadon, the other is white ceramic. Celadon is generally believed to come from the imitation of Yue kiln, while white ceramic is entirely the creation of Jingdezhen people.

Jingdezhen white ceramic has become the earliest white ceramic in the south, which is the product of Jingdezhen ceramic innovation wisdom, and has epoch-making significance for the development of southern ceramics. In the Song Dynasty, the wise craftsmen of Jingdezhen created a new type of ceramic - blue and white ceramic.

Blue and white ceramic is also known as shadow celadon, and its glaze color is between celadon and white ceramic. This innovation of Jingdezhen ceramic artisans in the Song Dynasty is also epoch-making significance, which influenced many ceramic producing areas and formed the largest Qingwhite ceramic kiln system in the South at that time. It is also the innovative charm of blue and white ceramic that attracted the attention of the emperor of the Song Dynasty, and was given the name of "Jingde", since then the name of Jingdezhen has enjoyed worldwide fame.

In the Yuan Dynasty, Jingdezhen had a new innovation, blue and white ceramic, egg white enamel successively created and burned. Blue and white ceramic, in particular, created the history of Jingdezhen colored ceramic and became the most outstanding representative of Chinese ceramics. Although blue and white ceramic was first born in the Tang Dynasty, it is generally believed to be produced in Gongxian Kiln. However, Jingdezhen Yuan blue and white is not derived from Gongxian Kiln in Tang Dynasty, but is a new creation by itself using the green material from the Middle East. In Ming and Qing Dynasties, Jingdezhen entered the peak of innovation and change, so it was in a dominant position in the market competition. On the one hand, Jingdezhen in the Ming and Qing Dynasties pushed blue and white ceramic to the peak of development, on the other hand, it successively created and burned colorful, pastels, blue and white exquisite and colorful high-temperature color glaze. In the late Qing Dynasty and the Republic of China period, although Jingdezhen ceramics have declined, there is still no shortage of innovation and change. The advent of light crimson ceramic and new pastel ceramic brought Jingdezhen ceramic painting to a new realm of literati painting.

After entering the contemporary era, Jingdezhen continues to carry forward the ideological spirit and wisdom of innovation and change. In the early days of the founding of New China, Jingdezhen built the most perfect modern ceramic industry system in China at that time, and the state-owned ceramic industry system headed by "ten ceramic factories" enjoyed a high reputation at home and abroad. Since the mid-1980s, Jingdezhen has entered a new period of innovation and change.

For example, Qin Xilin created "modern folk blue and white" by learning from the blue and white kilns of Ming and Qing Dynasties, and Li Jusheng integrated the high-temperature color glaze with blue and white and underglaze color to create the comprehensive painting art of high-temperature color glaze. Especially after entering the 21st century, Jingdezhen absorbs the essence of modern ceramic art, boldly changes and innovates, comprehensively breaks through the tradition, and builds a number of distinctive ceramic cultural creative industry parks, such as Tao Xichuan ceramic Creative Park and Sanbao ceramic Valley, etc., thus making the ceramic cultural creative industry develop rapidly, and the related ceramic cultural tourism industry is also heating up day by day.

It has become a popular tourist city featuring ceramic culture. In 2019, The State Council approved the establishment of the Jingdezhen National Ceramic Culture Inheritance and Innovation Pilot Zone in Jingdezhen, which is like giving the wisdom of the people of Jingdezhen wings to take off and helping Jingdezhen move forward into the development direction of the world famous ceramic center and tourism center.

### **Jingdezhen traditional ceramic craft and its wisdom**

#### **Jingdezhen traditional ceramic raw materials and fuels**

Jingdezhen traditional ceramic raw materials and fuels are from the local materials, almost no need to import raw materials and fuels from other regions to meet the needs of the entire ceramic production, fully reflects the local wisdom of Jingdezhen ceramic craftsmen.



Jingdezhen traditional ceramic tire system mainly uses ceramic stone and kaolin as raw materials. In the Song Dynasty and before the Song Dynasty, Jingdezhen Kiln used only a single ceramic stone ore as the raw material for ceramic matrix, and in the Yuan Dynasty, kaolin began to be added to the ceramic stone to make the matrix harder and denser.

Ceramic stone is a hard or semi-hard stony raw material, ceramic stone is the name of rock, but also the name of mineral raw material, is by feldspar, aplite, quartz porphyry, secondary quartzite and other acidic shallow rocks by hydrothermal alteration. In ancient times, the ceramic stone of Jingdezhen kiln mainly came from Jingdezhen Jinkeng, Nangang, Liujiawan, Ningcun, Sanbaopeng, Shouxi, Yao Li and other places. Gaoling Village is a small mountain village in the northeast of Fuliang County, Jingdezhen. It is famous for being rich in kaolin.

The kaolin produced in Gaoling Village is called Ming sand Gaoling to distinguish it from kaolin in other areas. However, by the Qianlong period of the Qing Dynasty, kaolin in Gaoling Village has been basically used up. As early as the 19th century, the international community has been similar to the village produced by the clay known as Kaolin, "Kaolin" from a village name evolved into an international noun.

The traditional ceramic glaze in Jingdezhen is called gray glaze, and the main raw materials are Yao Li glaze fruit and glaze ash. Yao Li glaze fruit is made of kaolin from Yao Li, and glaze ash is made of limestone and wolffthorn. Jingdezhen also has rich colored glazes. The basic raw materials of the color glaze are roughly the same as that of ordinary glaze, but contain a certain proportion of coloring raw materials (coloring agent) and auxiliary raw materials to help hair color, such as emulsion, flux, oxidation, reducing agent, etc., and emit a variety of bright colors after burning. Color raw materials are the raw materials of color glaze, which are usually divided into two categories: natural minerals containing metal compounds and chemical raw materials artificially purified. Jingdezhen traditional ceramic glaze raw materials mostly use natural minerals containing iron (Fe), copper (Cu), cobalt (Co), manganese (Mn) and other metal oxides.

In addition to matrix materials and glazes, Jingdezhen ceramic decoration also needs to use a variety of ceramic pigments. The main types of color painting in Jingdezhen kiln are blue and white, colorful and pastels. Jingdezhen blue and white materials are made of minerals containing cobalt. (Miller & Amos, 2017).

Colorful pigments are made of domestic natural mineral raw materials by traditional methods, and the raw materials are not many, and the preparation process is relatively simple. Pastels are developed on the basis of the preparation of ancient color materials. Qing Dynasty Kangxi, invented glass whites such opaque "powder" color, so that the picture produced a pink and fresh feeling, so the name "pastel". Pastel pigment is composed of raw materials of color agent and (flux Srivastava et al., 2022).

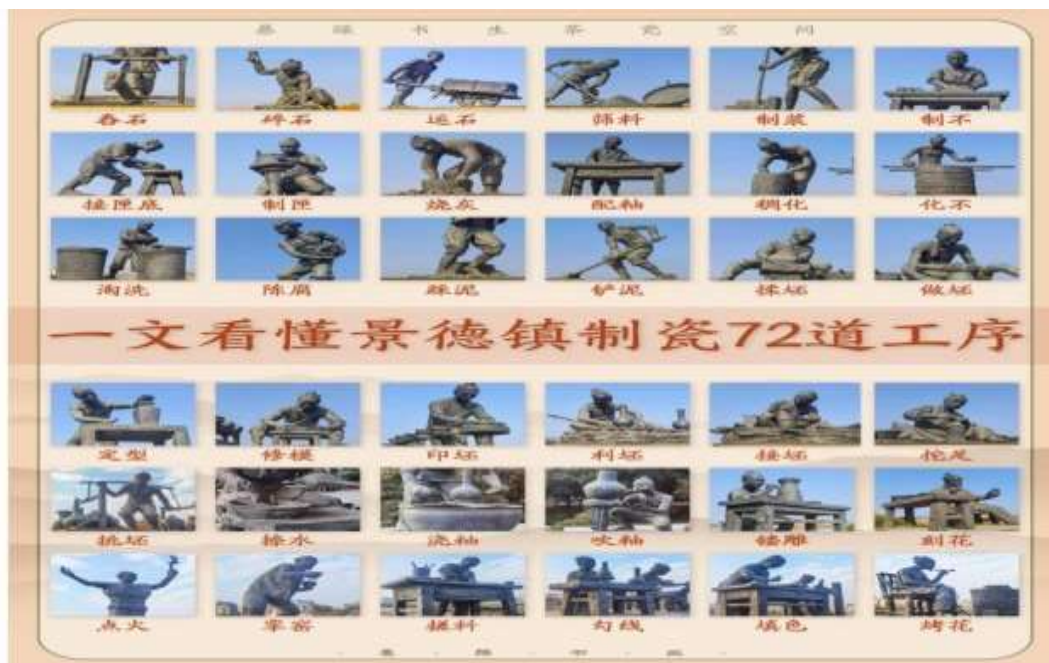
The traditional Jingdezhen ceramics were fired in chai kilns, and the pine wood used was mainly produced in the mountains of Fuliang County. The wise craftsmen of Jingdezhen adopted the method of water transportation to float the cut pine firewood down the Changjiang River system to the wharf along the Changjiang River in Jingdezhen, and then to be carried ashore by the pickers (Figure 4).

Chai kilns are used to make high-quality ceramics, but there are also some croucher kilns that use branches and wolffthorn as fuel to make some ordinary ceramics of relatively rough quality.



**Figure 4** Jingdezhen Pine and Firewood Transportation (quoted from "The Complete Worksof Jingdezhen Ceramics)

### Jingdezhen traditional ceramic production process and painting techniques



**Figure 5** Jingdezhen manufacturing ceramics 72 process diagram

Jingdezhen traditional ceramics have a very fine division of labor production process, the precise division of labor to ensure the exquisite Jingdezhen ceramics, is the summary of the rich experience of Jingdezhen ceramic craftsmen accumulated for thousands of years. Dr.

Joseph Needham, a famous British expert in the history of science and technology, said: "Jingdezhen is the earliest industrial city in the world. Before the Western Industrial Revolution, Jingdezhen ceramic has become a big industry in the world." In *Tiangong Kaiwu*, written by Song Yingxing at the end of the Ming Dynasty, the process of ceramic making in Jingdezhen is described in detail, and a sentence has been repeatedly quoted: "The total force of a blank can only be synthesized after 72 hands." The production process of Jingdezhen ceramics, from the beginning to the final completion, has to go through the hands of 72 people. Later, people will be extended to 72 processes. (Figure 5) It has even become a common saying in the whole industry. In fact, if you want to count all the process links in the entire ceramic production in Jingdezhen, it is far from 72 processes.

The first step in the ceramic production process is to mine the raw materials for ceramic production. Ceramic stone, kaolin and other ceramics need to be crushed and washed after mining. Traditional Jingdezhen ceramics are made by the traditional water-powered trip-powered crushing method, which has distinct regional characteristics. Its technological process is: the washing - artificial dolly - spring reef - dig reef - pan pulp slurry storage pool sedimentation - thickener concentration - drying dehydration - system (dun) - into the Treasury.

Next, the prepared mud is molded. The forming of Jingdezhen traditional ceramics mainly adopts the technique of drawing the blank, which is to place the mud ball into the center of the turntable of the pulley pulley specially used for drawing the blank, and pull out the rough shape of the ceramic ware by hand while turning the pulley pulley. Then it enters the printing process, that is, the blank body is covered on the special mold, and the mold is evenly pressed and removed, and the shape of the ceramic object becomes more regular. In order to make the objects more regular, the ceramic billet is put into the center of the wheel of the pulley, and then the billet knife is used to improve the billet surface and the thickness is moderate. After finishing, the billet is dried outdoors or in the kiln for drying.

After the ceramic body is dried, underglaze decoration can be carried out, such as blue and white, underglaze multicolor, etc., and then glaze firing into ceramic finished products, or direct glaze firing into a plain embryo, and then secondary firing after glaze decoration. In the development of ceramics for more than one thousand years, Jingdezhen has created rich types of ceramic decoration. Table 2 shows some ceramic decoration techniques and their characteristics in Jingdezhen.

Ceramic Craft	Description
High-Fire Ceramics	- Fired at high temperatures, usually above 1,200°C. - Thick and durable, commonly used for tableware and pottery.
Underglaze Color	- Colored designs painted on the raw clay, then glazed and fired. - Colorful patterns often appear on the surface, intricate and long-lasting.
Blue and White Porcelain	- Blue patterns created using cobalt oxide. - White porcelain body with classic blue designs, an iconic style of Jingdezhen.
Celadon	- Known for its characteristic pale green glaze, often used for tea sets and decorative items.
Cloisonné	- Metal wires separate different colored enamels. - Colorful and ornate, commonly used for crafts and decorations.

Jingdezhen's traditional ceramic decoration mainly includes blue and white, exquisite, enamel red, carved, ancient color, pastel, color glaze, etc., each with artistic features. Among them, blue and white, exquisite, pastels, color glaze, collectively known as Jingdezhen four traditional famous ceramic. The following is a brief introduction to the four famous ceramic manufacturing processes in Jingdezhen.

Jingdezhen blue and white ceramic was created and burned in the Yuan Dynasty. Natural cobalt was used to paint and decorate the ceramic, and then it was fired at high temperature after glazing. The glaze color was crystal clear, thorough, simple and elegant. The blue and white material dissolves between the fetal glaze, the hair color is green, although the color is single, but through the clever water separation techniques to produce rich tones. Linglong ceramic was created and developed on the basis of the hollowing process in the Xuande period of the Ming Dynasty, which has a history of more than 500 years. It is made on a thin blank, carved into a rice granular hole, and then filled with a special exquisite glaze Tonghua hole, and then fired into the kiln. In the Qing Dynasty, Jingdezhen ceramic artisans also skillfully combined blue and white with exquisite, forming the blue and white exquisite ceramic that everyone loves.

Pastel ceramic, also known as soft color ceramic, is a kind of glaze painting and low-temperature firing of the painting decoration method. Pastel ceramic is a new type of glaze color created on the basis of wucai ceramic in the late period of Kangxi in Qing Dynasty and influenced by the production technology of enamel color ceramic. From the late Kangxi dynasty to the Yongzheng and Qianlong dynasties, pastels became more and more perfect, and became popular in later dynasties.

The production process is: first on the white ceramic to draw the outline of the pattern, and then fill the color, in the temperature of more than 700 degrees Celsius baked, the color is soft, the picture is delicate and neat. Color glaze is to add a certain metal oxide to the glaze, after roasting, it will show a certain inherent color, which is the color glaze.

Affecting the color of the glaze is mainly the metal oxide that plays the role of coloring agent, in addition to the composition of the glaze, particle size, firing temperature and firing atmosphere has a close relationship, a wide variety, including red, green, blue, black, white and flower glaze, crack glaze, crystal glaze and other unique varieties.

### **Jingdezhen traditional ceramic making tools**

In order to make perfect and exquisite ceramic products, the traditional ceramic artisans in Jingdezhen, China, must choose and adopt appropriate tools according to the needs of raw material preparation, molding, decoration, firing, etc. Therefore, tools occupy an indispensable and important position in the traditional ceramic production in Jingdezhen. Jingdezhen craftsmen give full play to their wisdom, constantly explore and study in the actual production, and develop a rich variety of production tools, which can meet the needs of all production processes.

There are many traditional ceramic making processes in Jingdezhen, and almost every process requires the use of appropriate tools. The first is the tools required for the mining and preparation of ceramic raw materials. Artisans in the mine to dig ceramic ore or kaolin ore need to use a claw pick, hoe, pole, dustpan, basket, wheelbarrow and other mining tools and transportation tools. When preparing raw materials, the natural streams in the mountains are widely used, and the water vertebrae are used as a crushing tool to crush the mined ore, which greatly saves manpower and improves efficiency. The pulp washing, precipitation and other processes after the crushing of raw materials also need to use the corresponding tools.





**Figure 6:** Tools needed for ceramic molding

Next are the tools needed for molding. (Figure 6). The traditional ceramic making in Jingdezhen usually adopts the drawing block forming, and the pulley pulley specially used for drawing block is made. After pulling the blank, it is also necessary to print the blank and clean the blank. The printing blank uses a mold, and the sharp blank needs to use a special sharp knife. When pulling the billet, the craftsman leaves ceramic mud at the bottom, which needs to be dug out with a billet knife. The finished body also needs to be placed on a special wooden frame tool for drying.

Then there are the tools needed to apply the glaze. The glaze method is mainly swinging glaze and spraying glaze, swinging glaze tools are relatively simple, the use of wooden basin, spoon can be, and spraying glaze needs to use a special spray cylinder or watering can, with the mouth to the nozzle will spray cylinder or watering can in the glaze into a mist attached to the body.

And then the tools needed for painting decoration. Traditional ceramic painting tools in Jingdezhen mainly use brushes and some auxiliary tools, but because of the different types of ceramic pigments, the tools used in different types of ceramic painting also have certain differences. Most of the brushes used in Jingdezhen glaze color ceramic painting are special ceramic brushes, which are hand-made by Jingdezhen pen makers. It can be roughly divided into two types: one is a drawing pen, and the other is a coloring pen (Oliveira et al, 2022).

Drawing pen can also be called brush, brush, its main function is to dip oil glaze color pigments to outline the outline of the picture. Filling pen, also known as filling pen, refers to the brush used to fill the color in the outline. Colouring pens are also divided into large, medium and small different models. The brush used in Jingdezhen blue and white ceramic painting mainly has two categories: brush and water pen. The brush's bristles are hard and elastic, easy to contain water, and it is an ideal tool for drawing lines in blue and white ceramic realistic painting.

The dividing pen is used as the blue and white dividing water, so that the picture has a sense of hierarchy and three-dimensional. In addition to brush tools, ceramic painting also needs to use all kinds of auxiliary tools, such as the mixing knife for pigment, the grind bowl and hammer for grinding pigments, the plate and bowl for loading pigments, the pillow and hand board for auxiliary painting, and so on. Finally, the firing tool. When Jingdezhen ceramic body is fired in kiln at high temperature, saggar tools are often needed. The saggar tool is made of refractory material, which can ensure that the ceramic body is not damaged at high temperature.



### **Jingdezhen traditional ceramic kiln**

The prosperity of Jingdezhen ceramic industry is inseparable from the construction of ceramic kilns. On the basis of the use of dragon kilns and other ceramic kilns in other areas, the people of Jingdezhen gradually changed the structure of ceramic kilns, thereby creating a new type of ceramic kiln system, showing the wisdom of Jingdezhen ceramic craftsmen.

In the more than one thousand years from the Tang Dynasty to the Qing Dynasty, the ceramic kilns used in Jingdezhen ceramic have undergone constant changes, forming a variety of kiln types, and there have been dragon kiln, horseshoe kiln, gourd kiln, town kiln and other main kiln forms.

From the late Tang Dynasty to the Southern Song Dynasty, dragon kilns were mainly used in Jingdezhen. The dragon kiln is mostly built on the slope of the mountain, in a long shape, built according to the hillside, like a dragon, so it is called the dragon kiln. The structure of the kiln is divided into three parts, kiln head, kiln bed, kiln tail, long length, large flame drawing force, can be loaded with a large number of products, and the structure is simple, not only the use of pine wood as fuel, but also the use of thatch, branches, etc. as fuel, the cost is relatively low, the Tang and Song dynasties Jingdezhen celadon, white ceramic and blue white ceramic are fired by the dragon kiln.

In the Yuan Dynasty, the dragon kiln was no longer used in Jingdezhen, but the horseshoe kiln, which was similar to the steamed bread kiln in the north, was generally believed to be influenced by the craftsmen from the north who went south to Jingdezhen. Horseshoe kiln is named for its resemblance to horseshoe. Although it originated in the north, it flourished in Jingdezhen in the Yuan Dynasty. The horseshoe kiln is equipped with a kiln door, which is closed during firing, leaving a fire hole for fuel delivery, and two chimneys behind it for smoke discharge. There is a fire chamber inside the kiln for heating and heating, and a tooth table for placing products. There are two suction holes in the lower part of the back wall of the kiln, the top of the kiln has a fire penetration hole called the "sky eye", and there are 5 or 6 eyes around the bottom of the kiln roof for regulating the furnace atmosphere and observing the fire. The kiln is made of special refractory bricks.



**Figure 7** town kiln

At the end of Yuan Dynasty and Ming Dynasty, Jingdezhen kiln changed again, and gourd kiln became the main kiln form. The gourd kiln has a very detailed record in the book "Tiangong Kaiwu" written by Song Yingxing in the Ming Dynasty. The gourd kiln has the advantages of both dragon kiln and steamed bun kiln, and has made greater progress. The gourd kiln is folded inside the waist, divided into two chambers before and after, like two "steamed buns", there is a fire chamber and ash pit in front of the kiln, and a chimney is set in the back chamber of the kiln. The technology of half inverted flame of the horseshoe kiln is used, and the smoke hole is on the back wall, and there is an independent chimney. Due to the pumping effect of the chimney, the pressure in the kiln is basically in a state of zero pressure or negative pressure, and the temperature and atmosphere in the kiln are easier to control. Facilitate the effective use of kiln heat energy and the continuous improvement of product quality.

From the end of the Ming Dynasty to the Qing Dynasty, on the basis of the gourd kiln, the wise kiln workers in Jingdezhen created the most typical and important kiln form in Jingdezhen - the town kiln (Figure 7). Town kiln is egg-shaped, the structure is high and wide in the front, low and narrow in the back, and there is a chimney with the same length as the kiln at the end of the kiln. Both sides of the kiln body are surrounded by kiln bricks to protect the kiln wall as an air insulation layer to reduce internal heat loss and buffer the cracking caused by the expansion and contraction of the thin-wall kiln wall and the kiln top. The town kiln has a thin-walled chimney, the wall thickness is only 0.1-0.12m, the upper section is about 2 meters, the big head direction points to the front of the kiln, the funnel wall is vertical in front, the rear is contracted upward and inclined, the top is in the shape of a pen, and the tip is inclined to the kiln head. The reason why Jingdezhen in the late Ming and Qing dynasties could collect the great achievements of the famous kilns in the north and south of China and achieve the most prosperous era of ceramic in Chinese history is inseparable from the invention of the town kiln.

### **Jingdezhen contemporary ceramic technology and its wisdom**

After the founding of New China, Jingdezhen entered the contemporary development period. On the one hand, the contemporary ceramic craft of Jingdezhen has carried on the comprehensive inheritance of the traditional ceramic craft of Jingdezhen, and on the other hand, it has carried on the innovative development on the basis of inheritance, and achieved the victory of comprehensive transformation. In the early years of the founding of the People's Republic of China, Jingdezhen boldly carried out reform, transforming the original Jingdezhen manual ceramic system into a modern state-owned ceramic factory, using the most advanced ceramic machinery and equipment for mass production.

These state-owned ceramic factories, known as the "top ten ceramic factories", have been brilliant for decades, and their products are exported to countries around the world, earning a lot of foreign exchange for the country. In the late 1990s, due to various reasons, Jingdezhen "top ten ceramic factories" have been shutdown, closed down, restructured, the former glory has ceased to exist. However, the people of Jingdezhen are not discouraged, they rely on the wisdom of the hands, from scratch, to build a large number of manual ceramic workshops, manual ceramic system has been fully revived, and once again become the pillar industry of Jingdezhen ceramics, to achieve the second transformation of contemporary Jingdezhen ceramic technology development. After entering the 21st century, Jingdezhen ceramic industry began a new journey of development. Today, Jingdezhen handmade ceramic industry has developed into a ceramic cultural creative industry, and ceramic cultural creative industry as the core, with the auxiliary of daily ceramics, buildingsanitary ceramics and industrial ceramics, forming a new ceramic industry system. Under the new contemporary ceramic industry system, Jingdezhen ceramic technology has also undergone great changes.

The wisdom of Jingdezhen ceramic workers on the basis of inheriting the tradition of innovation, the formation of the traditional and modern blend of new ceramic craft system.

### **Inheritance and innovative development**



**Figure 8** The original Jingdezhen Art ceramic Factory creation scene (quoted from "The Complete Works of Jingdezhen Ceramics")

Contemporary ceramic craft in Jingdezhen has largely inherited the traditional ceramic craft, and the traditional ceramic craft has never completely disappeared in Jingdezhen, becoming a model for the activation and development of ceramic intangible cultural heritage. In the early years of the founding of the People's Republic of China, Jingdezhen maintained the original ceramic handicraft system. Even after the establishment of the "Top Ten ceramic factories", the traditional ceramic handicraft system has not been abandoned, but has been integrated into the new modern ceramic enterprise system. For example, Jingdezhen Art ceramic Factory still maintains the traditional handmade ceramic process (Figure 8), and uses a complete traditional handicraft process to complete the production of traditional pastel ceramic.

Each large ceramic factory is equipped with an art laboratory, which is especially responsible for the protection and excavation of traditional ceramic crafts, such as the blue and white exquisite ceramic products developed by Jingdezhen Guangming ceramic Factory, the blue and white Indus products developed by Jingdezhen People's ceramic Factory, and the "Twelve gold pins" ceramic plate products developed by Jingdezhen Universe Ceramic Factory. These products are well-known at home and abroad based on traditional handicrafts.

In particular, the state attaches great importance to the development of arts and crafts and regards it as an important means of earning foreign exchange from exports, which promotes and promotes the protection and development of traditional ceramic crafts in Jingdezhen. With the decline of Jingdezhen's state-owned ceramic factory system, Jingdezhen's traditional ceramic handicraft has been revived, and traditional ceramic handicraft workshops are spread all over the city's major ceramic industrial parks. In these traditional ceramic handicraft workshops, many old artists have played an important role, and with their efforts, Jingdezhen traditional ceramic handicraft has been fully restored and developed.

Contemporary Jingdezhen ceramic technology is not limited to the inheritance of traditional ceramic technology, but on the basis of inheritance, combined with the development situation and requirements of the new era, bold innovation and change to adapt to the new era and market demand. In 2019, The State Council officially approved the establishment of the Jingdezhen National Ceramic Culture Inheritance and Innovation Experimental Zone in Jingdezhen, so that the inheritance and innovation of Jingdezhen ceramic technology has entered a new stage of development. The innovation of contemporary Jingdezhen ceramic craft on the basis of inheritance is mainly reflected in the following aspects.

Contemporary Jingdezhen ceramic raw materials are still mainly used ceramic stone and kaolin. However, unlike traditional raw materials, because the ceramic raw materials in Jingdezhen have been basically exhausted, it is listed as a resource-exhausted city in China, and most of the ceramic stone and kaolin are imported from other places. In terms of fuel, the traditional wood kilns using pine wood fuel are still retained to a certain extent, but the number has been very small. Because of the serious destruction of the forest by the firewood kiln, it began to replace the firewood kiln with coal as fuel in the early days of the founding of the People's Republic, and achieved success.

Under the resolution of Jingdezhen local government, the first coal kiln was successfully developed and officially put into use in 1956<sup>4</sup>. Nowadays, Jingdezhen ceramics basically use gas kilns and electric kilns, using gas and electricity as fuel, and firewood kilns and coal kilns, which are seriously polluted to the atmosphere, are rarely used. Gas kilns and electric kilns not only pollute less of the atmosphere, but also can carry out more accurate temperature and atmosphere control through electronic control equipment, which can greatly improve the yield and reduce the waste of resources.

The traditional Jingdezhen ceramic process is a fully manual process, and today, the traditional handicraft has been largely retained, but it also integrates a lot of advanced equipment and methods to improve efficiency and reduce labor intensity. For example, the mining of ore raw materials uses advanced mining and transportation equipment, no longer shoulder to shoulder. The preparation of raw materials also adopts advanced ball mills for grinding and panning, and the water vertebroid has been eliminated. The manual pulley pulley used in forming is no longer used, but the advanced electric pulley pulley is used to pull billets.

In addition, there are more advanced 3D printing equipment, using this equipment can be automatically printed from the soil, very simple. The kiln equipment is also advanced gas kiln and electric kiln, which can be automatically controlled, greatly improving the yield. In terms of painting techniques, on the one hand, there have been industrial means such as decal paper, on the other hand, there have been many changes in manual painting, a large number of new materials and new processes have been adopted, and the artistic appearance of painted ceramic has changed every day. Such as the emergence of new painting tools and pigments similar to color lead, so that it can be achieved on the ceramic blank similar to the pencil painting.

### **Communication and integration based on the development of cultural and creative industries**

Cultural and creative industry is a sunrise industry in China, which has been developing continuously since entering the 21st century and has become the economic growth point of many cities. After more than one thousand years of ceramic industry development, Jingdezhen's ceramic raw materials and minerals have been basically exhausted, and under the reform and opening up of the market economy, Jingdezhen does not have the location

<sup>4</sup> Chen Ning, Wang Xianlu, Zhao Xiaoying, Luo Xu. The development and evolution of Jingdezhen firewood Kiln in the 70 years since the founding of New China [J]. China Ceramics Industry, 2019 (05): 97.

advantage, large-scale production is no longer suitable for the development of Jingdezhen ceramic industry, therefore, the transformation to the ceramic cultural and creative industry has become the inevitable direction of Jingdezhen's development. In recent years, under the development of ceramic culture and creative industry, Jingdezhen ceramic technology has seen unprecedented extensive exchanges, including exchanges between Jingdezhen and domestic, but also a large number of international exchanges, and in the exchanges, Jingdezhen ceramic technology is learning from different strengths, inclusive, and constantly growing and developing in the integration. On August 26, 2019, the National Development and Reform Commission and the Ministry of Culture and Tourism officially issued the "Implementation Plan of Jingdezhen National Ceramic Culture Inheritance and Innovation Pilot Zone", Jingdezhen ceramic culture industry is facing a major opportunity<sup>5</sup>.



**Figure 9:** Sanbo ceramic Valley

First of all, the development of Jingdezhen's ceramic cultural creative industry has promoted the integration and utilization of Jingdezhen's ceramic craft resources. The rise of Jingdezhen ceramic culture creative industry is not long, 2005 Hong Kong Lotte ceramic Society settled in Jingdezhen sculpture ceramic factory is a landmark event.

Since then, the ceramic culturalcreative industry in Jingdezhen has gradually developed, and a number of ceramic cultural creative industrial parks have been established in Jingdezhen, including sculpture ceramic factory, Tao Xichuan, Sanbao ceramic Valley (Figure 9), Jianguo ceramic Factory, Mingfang Garden, etc. The establishment of these parks has largely changed the small, scattered and chaotic characteristics of Jingdezhen's ceramic industry, bringing together scattered folk ceramic enterprises and individual workers. In the park, Jingdezhen ceramic workers are concentrated together, so that they can learn from each other in ceramic technology, exchange and integration, and in the exchange and integration, Jingdezhen ceramic technology can bebetter inherited and transformed.

Secondly, the development of Jingdezhen's ceramic cultural creative industry has created a great integration of ceramic techniques across the country. In recent years, various ceramic cultural and creative industrial parks built in Jingdezhen have not only concentrated Jingdezhen

<sup>5</sup> Yan Ningning, Research on the relationship between Jingdezhen ceramic culture Industry Collaborative agglomeration and the development of the National pilot Zone [J]. Business Economics, 2020 (11): 44.



but also played the role of nesting and attracting phoenix, attracting ceramic enterprises and ceramists from all over the country to settle in the park. In the major parks of Jingdezhen, a large number of local ceramic enterprises and ceramists can be seen everywhere, and the locals affectionately call them "Jingpiao".

Foreign enterprises and ceramists brought the traditional ceramic craft and contemporary innovative craft from all over the country, and they exchanged and cooperated with local ceramic workers in Jingdezhen to seek common development of ceramic craft, so that Jingdezhen reproduces the spectacular scene of "the great success of famous kilns in the world" in history, thus greatly speeding up the pace of transformation and development of Jingdezhen ceramic craft from traditional to modern. Jingdezhen has become the center of ceramic technology development in China.

Finally, the development of Jingdezhen ceramic cultural creative industry has promoted the cooperation and integration of international ceramic technology. Jingdezhen ceramic cultural creative Industry Park has also attracted the attention of ceramists around the world. A group of ceramists from all over the world are coming to Jingdezhen. Ceramists from all over the world can be seen everywhere in the major ceramic industrial parks in Jingdezhen, bringing various international ceramic techniques to Jingdezhen, some ceramic techniques are full of national characteristics, and some ceramic techniques are of international standard. The arrival and settlement of international ceramists put Jingdezhen ceramic craft into a broader space to develop and grow, and laid the foundation for Jingdezhen to become the world ceramic capital again.

### **Green development path**

China is the world's largest ceramic producer, producing a large number of ceramic products every year, which has made a huge economic contribution to China, but at the same time, it has also caused greater damage to China's natural environment. Jingdezhen ceramics after thousands of years of development, once caused great damage to the environment. In ancient and modern times, Jingdezhen mainly used firewood kilns, the forest resources were seriously damaged, and the smoke of firewood kilns also caused a great impact on the atmosphere.

The contemporary Jingdezhen ceramic industry used to mainly use coal kiln, which caused great pollution to the air. After entering the 21st century, the coal kilns in Jingdezhen ceramic industry are no longer used, replaced by more green gas kilns and electric kilns. However, the environmental pollution and destruction of Jingdezhen ceramics still exist, therefore, Jingdezhen adopts a green development road, and strives to achieve both the development of ceramic industry and the beautiful natural environment. Today, we see that due to the adoption of a large number of green ceramic process measures in Jingdezhen, Jingdezhen has a high forest coverage rate, the air is particularly fresh, and it has become a popular tourist destination in the eyes of tourists.

In recent years, Jingdezhen has adopted many ceramic technology means and strategies that are conducive to green environmental protection, involving various links. The renovation of the kiln is one aspect, and the utilization of waste ceramics is also a very important aspect. In the past industrial large-scale production, Jingdezhen produced a huge amount of waste ceramics, which had a continuous impact on the environment and pollution. Jingdezhen has adopted various environmental protection technology measures to solve the problem of waste ceramics. On the one hand, through the development of cultural and creative industries, focus on the production of fine ceramics, enhance the cultural added value, on the other hand is the reuse of waste ceramics. In recent years, Jingdezhen has attached great importance to the reuse of waste ceramics and adopted a variety of recycling methods.

Firstly, waste ceramics are used to produce ceramic raw materials. Some ceramic enterprises in Jingdezhen have realized the harm of waste ceramics, and actively carried out the reuse work of waste ceramics, crushed waste ceramics, and made ceramic raw materials for the production of ceramic products. However, in the reuse of waste ceramics, these ceramic enterprises have encountered greater difficulties, because these waste ceramics contain enamel, the raw materials made from the reuse of waste ceramics are more difficult to be re-fired, and cost more money. Therefore, in order to ensure the quality of products and save money, most of the waste ceramics are still discarded as industrial waste. Only a few ceramic enterprises in Jingdezhen have been successful in the recycling of waste ceramics. For example, Jingdezhen ceramic Sea ceramic Co., Ltd. has a relatively mature waste ceramic recycling and treatment technology, which can make good use of waste ceramics recycling and manufacturing as raw materials, and the recycling rate of waste ceramics has reached more than 80%. The ceramic products made of these raw materials even exceed the performance of ordinary ceramic products.

Secondly, waste ceramics are used to make industrial cement. Waste ceramics and cement are very similar in mineral composition, are mainly silicate minerals, so it can be used in the manufacture of cement after grinding. A small number of cement enterprises in Jingdezhen have begun to try to use waste ceramic powder to make cement. If this technology is promoted, waste ceramics will become a cheap raw material for making cement, which can not only consume a large amount of waste ceramics, but also provide a large number of new cement products for urban construction, and achieve a win-win situation of social and economic benefits.

Thirdly, waste ceramics are used to produce building ceramic tiles. After the recycling of waste ceramic, it can also be used to make a variety of building ceramic bricks, such as antique ceramic bricks, firebricks, permeable road bricks and so on. This technology is still in the research and exploration, the use of the domestic is not common, Jingdezhen love and ceramic ceramic company after repeated tests, successfully developed the relevant technology, can use waste ceramics to make antique ceramic tile series products. The use of waste ceramics for the production of antique ceramic tiles, the material used is low in price, and can be developed according to the type of waste ceramics of different styles of antique ceramic tiles, belong to the economic and environmental protection products.



**Figure 10:** A bridge made of waste ceramics in the ancient kiln of Jingdezhen

Finally, in addition to recycling as ceramic raw materials, another more important use of Jingdezhen waste ceramics is artistic utilization. In Jingdezhen city public space, there are many landscape art made of waste ceramics. Ceramic art designers in Jingdezhen use waste ceramic fragments rich in Jingdezhen regional characteristics to produce various public landscape art, which is widely used in sculpture art, installation art, public facilities, architecture, murals and other fields. In Jingdezhen, we can see a lot of roads, Bridges, walls, buildings and environmental ceramics made of waste ceramics (Figure 10), which can not only beautify the urban environment of Jingdezhen, improve the aesthetic perception of citizens, but more importantly, find a new way for the recycling of waste ceramics, and fully demonstrate the wisdom of Jingdezhen people.

## Conclusion

Jingdezhen ceramics is an important part of China and even the world ceramic culture. It has won the praise and love of Chinese and foreign people with its exquisite craft, rich varieties, unique style and profound cultural heritage. Jingdezhen ceramics is not only a kind of practical goods, but also a kind of art, and a kind of cultural symbol, which records the changes of Chinese history and culture, spreads the wisdom and emotion of the Chinese people, and shows the creativity and charm of the Chinese people.

Throughout the development of Jingdezhen ceramic technology, Jingdezhen has not only accumulated very rich experience in traditional ceramic technology, but also demonstrated outstanding achievements in the innovation and development of contemporary ceramic technology. In addition to our sincere admiration for Jingdezhen's exquisite ceramic technology, we also need to analyze and explore the hidden deep reasons through the surface of the ceramic technology performance.

The prosperity and development of Jingdezhen ceramic technology is formed under the influence of various factors, but the local wisdom of Jingdezhen is an important factor that cannot be ignored and is also a decisive factor. Therefore, to fully carry forward the traditional local wisdom and integrate the new local wisdom in line with the spirit of The Times is an important responsibility and mission of contemporary Jingdezhen ceramic industry. Only in this way can Jingdezhen ceramic technology continue to develop for a long time.

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