

# Watertight Compartment Fujian Ancient Ship Art Value and Extended Development Take the "Hei Bo Wu Qing An" ship type as an example

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**Abstract.** As the "Cultural Capital of East Asia" and one of the starting points of the Maritime Silk Road, Quanzhou has nurtured a long-standing maritime culture, and the prosperity of maritime trade cannot be achieved without exquisite shipbuilding techniques. In July 2021, "Quanzhou: China's World Maritime Trade Center in the Song and Yuan Dynasties" was successfully declared a World Heritage Site. More and more local intangible cultural heritage in Quanzhou is being paid attention to and protected, and the watertight, compartmentalized Fujian ancient ship is one of them. The Fujian ancient boat is the Quanzhou people's contribution to maritime culture, with deep cultural heritage, a major invention of China's ancient shipbuilding technology, high artistic and aesthetic value, and a unique connotation; we must excavate and protect it as part of our intangible cultural heritage. In order to better understand the connotation of watertight compartment Fujian ancient ships, the author conducted several field studies in Fengwei Town and Quanzhou City, the birthplace of watertight compartment Fujian ancient ships. This paper explores the artistic value of Fujian's ancient boats in Quanzhou, Fujian, and their extended development from the perspective of art design.

**Keywords:** Watertight compartment Fujian ancient ship; "Hei bo wu qing an" ship type; Mazu culture; artistic value; extension value

The watertight compartment of the ancient Fujian boat is an important part of Quanzhou's non-heritage culture, which not only nurtures Quanzhou's profound maritime culture but also has great artistic value, market development, and industrial development. However, the traditional fishing work form has changed, wooden boats are gradually being replaced by steel boats, and there are fewer and fewer inheritors of watertight compartment Fujian ancient boats, so it is especially important nowadays to better protect the watertight compartment Fujian ancient boat skills, explore their artistic value, and better develop their market potential to give them a new life.

## 1. Overview of the Fujian Ancient Ship's Watertight Compartment

As the starting point of the "Maritime Silk Road" in ancient times, Quanzhou had a well-developed maritime industry, which developed even more rapidly during the Song and Yuan dynasties, becoming the first port in the East comparable to the "Port of Alexandria." On July 25, 2021, "Quanzhou: The World Maritime Trade Center of Song and Yuan China" was inscribed on the World Heritage List at the 44th session of the UNESCO World Heritage Committee held in Fuzhou. A large number of intangible cultural skills have received widespread attention, among which the watertight compartment of the ancient Fujian boat is one of them. Watertight compartment Fujian ship manufacturing technique was invented in the Tang Dynasty and was widely used in the construction of sea ships after the Song Dynasty. Fujian ancient ship is the collective name of the Fujian coastal area with pointed bottom sea ships and one of the four ancient ships in China, and the watertight compartment Fujian ancient ship is one of them. Fujian ancient ships are mostly used in the area of Fujian and are suitable for ocean-going. Zheng He traveled west on the Fujian ancient ship, the bottom keel and side plate connection to the ship recessed, the stern protruded outward, and the craftsmen bent and positioned these massive and hard pieces of wood to

the hull of the ship using precise calculations and enough shipbuilding experience. More than 700 years later, watertight compartment technology was used on the famous Titanic, and despite sinking due to a cold brittle fracture of steel, the watertight compartment bought 2 hours and 40 minutes of rescue time for more than 700 survivors.

Quanzhou, east of the Taiwan Strait, fast currents, watertight compartments Fujian ancient ships used a special geographical location to resist stronger currents and ensure normal navigation; the keel was deeper and the hull was more solid. The watertight compartment is the core technology of Fujian ancient ships, i.e., each compartment is separated from each other by horizontal partitions and impermeable to water, which improves the hardness of the ship to a greater extent so that even if one compartment hits the reef and water enters, it will not endanger the other compartments. At the same time, the watertight compartment serves as the support point for the bending of the hull plate, which also improves the solidity of the sailing ship and reflects the uniqueness of the manufacturing techniques of Fujian ancient ships.

## **2. The Artistic Value and Extension of the Watertight Compartment of the Fujian Ancient Ship**

As an important part of the national intangible cultural heritage, Fujian ancient boats are an important part of the regional culture of Quanzhou and an external manifestation of the material foundation and spiritual civilization of the people of Quanzhou, and have attracted many scholars to study and explore the artistic expression of Fujian ancient boats from different perspectives, so as to study the artistic value and extended value of Fujian ancient boat culture.

### **2.1 Artistic value of watertight compartments in Fujian ancient ships**

The Fujian ancient boat was primarily used for military and commercial navigation in ancient times, and its artistic value stems from the Quanzhou Quan Hong Kong people's combination of special regional characteristics and folk culture. There are three main types of Fujian ancient ships themselves, which are "Zhenghe treasure ship," "Zhenghe warship," and "Hei bo wu qing an" ship type, among which "Hei bo wu qing an" ship type is the most widely used in Quanzhou Quan Gang area, and the color is richer compared with "Zhenghe warship" and "Zhenghe treasure ship," which are also the most applied Fujian ancient ship types in Quanzhou area for modern ship model making.

2.1.1 watertight compartment Fujian ancient ship modeling color intention to obtain and expression form, as an example, "black ship five green case" ship type

The design of the hull shape of the ancient Fujian boat is closely related to the lives of the people of Quanzhou, conveying the reverence and love of the people of Quanzhou for the sea. Fujian ancient ship construction method is usually shipbuilding master oral transmission, no fixed design drawings, extremely strong experience, design process according to different ship use needs and size requirements, in the overall structure of the same different design, has the characteristics of diversity, which is the reason that

The most representative ship type of Fujian's ancient ships is the "Hei bo wu qing an" ship type. The "Hei bo wu qing an" is mostly used in ancient times for the official ship, both sides of the ship have a ship gun rack, modern gradually changed to imitate the official ship gun rack, painted to confuse the enemy ship's black fake hole (gun eyes), so the name "black ship five gun holes" ship was "Hei bo wu qing yan", many scholars studied it over the years, and the fixed name was changed to "Hei bo wu q The ship has humanized construction features, in addition to the pointed bottom broadside shape and unique internal watertight compartment structure, as well as bright colors and patterns, fully applying our traditional culture and local maritime culture in the design of the shape, color, and pattern.

The interesting "Zodiac" naming method is adopted in the naming of the modeling structure, and the design is named by combining the features of the animals of the zodiac with the function of the hull structure. There are "Rat Bridge, Ox Bar, Tiger's Mouth, Rabbit's Side, Dragon's Eye, Dragon Bone, Water Snake, Horse's Face, Sheep's Horn, Monkey's Head, Chicken's Kitchen, Dog's Steak (Dog's Teeth), Pig's Rack". "Rat Bridge" is located on the bow of the Dragon Eye side of the ship, two upward-pointing horns, the rat ranks first in the twelve zodiac signs, reflecting the bow of the ancient Fujian ship; "bull pen" is the name of the fence on both sides of the ancient Fujian ship, used to protect both sides of the ship, to protect the safety of the crew. The "Tiger's mouth" is located in front of the bow of the ship, which was mostly used for warships in ancient times to reflect the majesty of Fujian ancient ships; "Rabbit's side" is the name of the toilet at the back of Fujian ancient ships; there are two parts of the Chinese zodiac dragon which are "Dragon's eye" and "dragon bone". The "dragon eyes" are located on both sides of the bow, when used for warships, the dragon eyes look forward, when used for fishing boats, the dragon eyes look down, which is also an important symbol to distinguish warships and fishing boats in ancient Fujian. The "keel" is located at the bottom of the ship, which is the core part of the ship, and the quality of the keel determines the quality of the ship; the "water snake" is located at the protruding part below the five gunholes, which is used for the safety of both sides of the ship and can reduce the damage to the ship from the impact on both sides. The "horse face" is located on the mast, and the middle is hollowed out for the "monkey head" structure; the "ram's horn" is located on the fence between the bow and stern, and the number of fence rails depends on the size of the ship. The number of rails depends on the size of the ship, mostly 4 and 6; the "monkey head" is located in the middle of the "horse face", which is the pulley to lift the sails; the "chicken kitchen" is located in the position of the internal kitchen at the stern of the ship, which was used to raise chickens and other In ancient times, chickens and other poultry were kept in the stern of the ship as food and were also used to tell the time, so the kitchen was also called the chicken kitchen; the "dog tooth" was located under the sail and was used to fix the lifting sail; the "pig frame" was located at the back of the sail and was used to fix the sail after it was lowered]. These humanized structural features, placed in different positions on the ship, enable the crew and sailors to quickly enter clear positions in the operation, so that they can perform their respective duties and reduce mistakes, and the captain also gives orders with the metaphorical names in the "12 zodiac signs", so that the ship is in order and in order.

In addition to the structure and naming of the hull, the colors and patterns also bring traditional culture into full play. The colors of the hull are largely based on the culture of Mazu as the inspiration for design and creation, and the costumes and patterns of the statue of Mazu have become the main source of reference for the colors of the hull of the ancient Fujian boat. The costume of Mazu is the dress code of A-Ma during her lifetime, with a sea-blue slouchy shirt as the top, symbolizing the wide sea. The lower body is red and black pants; legend has it that the pants were originally red, but due to Mazu's years at sea helping fishermen, wet by the seawater, they look black from afar; the upper body is not wet or red, but has evolved into the current style over time. Its color combination has very southern Fujian regional characteristics; the hull color is mainly composed of black, red, blue, and green, which is also the origin of the "black ship with five green cases" ship type. The main color scheme of red and black underneath the hull is similar to the color scheme of red on top and black on the bottom of A-Ma's costume pants (Fig. 1), red being the traditional auspicious color in China for good luck, peace, and tranquility. The top of the hull is dominated by sea blue, similar to the sea blue of the top of A-Ma's costume. A-Ma is always at sea to rescue fishermen, like a lighthouse on the sea, which means like a lighthouse to light up the direction of fishermen. The Fujian ancient boat's bow is painted with a picture of waves holding up a round of the rising sun, with the symbolic meaning of "promising future," and the stern is carved with the lapel flower of Mazu and shoe pattern of the loach pattern (Fig. 2), to "all go well." "Pray for peace" has a symbolic meaning; there is another saying about loaches: the wood is easy to be

eroded by vermin, and loaches specialize in eating vermin, so the loach pattern painted on the stern of the boat has a symbolic meaning of preventing vermin.

The production of the hull reflects the shipbuilder's craftsmanship, and the pattern of the hull reflects the Minnan people's reverence for the sea and the people's bravery and struggle. All are an expression of praying for blessings, peace, and to ward off evil spirits, and so on the basis of the design of the hull structure and color pattern design, there are a lot of elaborate elements. It not only meets the practical safety needs of the crew when sailing but also meets people's spiritual needs, emotional needs, and cultural needs, and at the same time reflects the inheritance of non-heritage cultures.



Fig. 1 Fujian Ancient Ship "Hei bo wu qing an" (photo taken at the Fujian Ancient Ship Center of Fengwei National Intangible Heritage, Quangan District)



Fig. 2 Fujian Ancient Ship Bow Pattern (shot at the Fujian Ancient Ship Center of Fengwei National Intangible Heritage, Quangan District)

### 2.1.2 The cultural pursuit of watertight compartments in ancient Fujian ships

In the redesign of the watertight compartment Fujian ancient ship with a long history, it is required to study the art design form of Fujian ancient ship, deeply understand the historical heritage of Fujian ancient ship, extract the decorative patterns and color matching elements with artistic design significance, interpret and innovate the elements of Fujian ancient ship on the basis of not changing the traditional cultural connotation, so as to create a new product with perfect combination of tradition and modernity.

With the development of wooden boats for safety and navigation policy, there are few large wooden boats used for navigation. Fujian's ancient ships are more often seen in the form of ship models in public nowadays. When exploring the cultural connotation of watertight compartments in ancient Fujian ships, it is also necessary to consider people's different aesthetic needs and cultural identity so as to better inherit and carry forward. The watertight compartment Fujian ancient boat has high artistry, and besides continuing to carry forward the most original traditional boat model, it can also promote the Fujian ancient boat through tourism culture and other ways. Traditional ship models are beautifully made and expensive, which is not conducive to wider promotion, such as combining with cultural tourism products to promote not only enriching people's lives but also promoting the culture of Fujian ancient ships by subtle means.

### 2.1.3 Innovative design of a watertight compartment in an ancient Fujian ship

Watertight compartment Fujian's ancient boat skills are the product of Quanzhou people's unique understanding of life and the precipitation of history and culture. When studying the innovative points of the watertight compartment of the ancient Fujian boat, we should consider both inheritance and development, and on the basis of retaining the essence of the original culture, combine modern art design aesthetics and elements of the time for innovative design. From the structural characteristics of Fujian ancient boats to the artistic and cultural connotations and expressions of the design, the most typical "zodiac" hull structure and the color pattern of Mazu elements are transformed into visual language elements, making the performance of Fujian ancient boats follow the pace of the times.

While studying the artistic value of Fujian's ancient boats, new forms of creative design for the cultural traits they possess can be incorporated into various fields, such as packaging design and brand image design. For example, the typical features of the Fujian ancient ships can be incorporated into the packaging design, and the color matching of the packaging can inherit the color scheme of the Fujian ancient ships themselves, with the distinctive red, blue, and black tones of the Mazu costumes. design, the design of both traditional cultural heritage and adapting to contemporary design aesthetics The decoration base pattern and packaging products that are to carry forward the characteristics of Fujian ancient boat culture at the same time are also an opportunity to spread more Minnan culture to the outside.

## 2.2 The extended value of watertight compartments in Fujian ancient ships

Watertight, compartmentalized Fujian ancient boats well reflect the wisdom and reverence for the sea of the people of Quanzhou, and their modern value is also very rich. With the successful declaration of intangible cultural heritage in Quanzhou in 2021, the intangible cultural heritage culture of Fujian ancient boats enters the public eye, and a large number of resources about Fujian ancient boats are noticed. As an important member of the nation's intangible cultural heritage, Fujian's ancient boats will become a new resource and enter the market.

### 2.2.1 Aesthetic value of watertight compartments in ancient Fujian ships

Fujian ancient ships not only have the practicality of sailing and reference of shipbuilding structure, but also reflect the unique formal beauty in artistic aesthetics and become an important part of the culture. The structure is exquisite and strict, reflecting the ingenuity of shipbuilding masters in successive generations; the shape is unique in cultural connotation to adapt to the environment and humanities; and the color pattern also shows the characteristics of southern Fujian and coordinates people's vision, making Fujian ancient ships the product of the combination of technology and art.

### 2.2.2 The cultural value of a watertight compartment Fujian ancient ships

As a valuable intangible cultural heritage inherited for thousands of years, Fujian ancient boat culture has a profound cultural heritage and a wide variety, and is an important link in the composition of Fujian maritime culture. The value of Fujian ancient ship culture is based on its own practicality and extended function and has a characteristic local flavor, which is also the

concentrated embodiment of Fujian maritime culture and the window of ancient China looking to the world and the world looking to China.

Firstly, the watertight compartment Fujian ancient boats have fully preserved and reflected the characteristics of "Fujian ancient boats," from the boat shape to the smooth curve design, and their forms have certain research significance for functional aesthetics and product design art. Secondly, they retain rich regional industry characteristics of shipbuilding and navigation folk customs, which can be regarded as a valuable heritage of traditional folk culture. The watertight compartment of the Fujian ancient ship reflects the profound heritage of Fujian ancient ship culture in various aspects such as ship design, material selection, construction technology, appearance and color, etiquette, and taboos, which need to be inherited and carried forward. Making the culture of Fujian ancient boats a treasure of intangible cultural heritage will help to protect the watertight compartments of the boats and facilitate their dissemination and communication.

#### 2.2.3 Market value of watertight compartments on Fujian ancient ships

Steel ships replaced wooden ships as the new era began, creating watertight compartments. Fujian ancient ships are more in the form of ship models on the market, sold at home and abroad with varying degrees of sophistication to achieve the economic value of the product. Fujian's ancient ship culture has a long history and deep heritage; its value in development is high; the times are progressing; people's needs are also improving. In the Quangan district of Fengwei, the national intangible cultural heritage of Fujian, the Fujian ancient ship center, and the Lin Pei Zong interview, for example, the body length of the 50 cm "black ship, five green cases" ship model costs about 3000 yuan, clearly not conducive to wider public circulation. The ancient boat culture can be developed into ornamental and practical products with small size and low price, such as breaking through traditional boat model making materials and making it into the form of co-branded Fujian ancient boat LEGO blocks, interacting with the public in a different way, and the age group of contact can be as low as children; the special color and pattern of the Fujian ancient boat itself can be combined in the interior soft decoration and furniture. The special colors and patterns of Fujian ancient boats can be combined in interior soft furnishings and clothing, using colors, patchwork, and other artistic features to redesign and further show the culture of Fujian ancient boats to the public.

### 3. Overview of the Fujian Ancient Ship's Watertight Compartment

In the light of the past, the ancient Fujian ships sailing on the Maritime Silk Road made great contributions to the trade, cultural exchange, and integration of coastal countries and regions, relying on their excellent performance to travel between the Eastern, Southern, and Western routes. Watertight compartment Fujian ancient ship culture is the result of combining material and spiritual civilization, a cultural charm that reflects the local people's life atmosphere and demonstrates regional characteristics, with certain artistic value and great development potential. With the spread of Fujian ancient boat culture to this day, we should fully absorb the nutrition brought to us by the culture, fully develop, and realize the creation in order to promote the development of Fujian ancient boat culture.

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