

## **Competitive advantage of products with decorative Jade coating**

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**Abstract.** The article discusses the issues of increasing the competitiveness of various products, including mechanical engineering, in the international market. The article shows that China is one of the most promising markets for the sale of products of Russian manufacturers. Based on the analysis of literature data, it was shown that products with a decorative coating made of Jade will have high competitive advantages in the Chinese market, therefore, it is necessary to conduct scientific research in this direction.

**Keywords:** Jade, competitive advantages, healthy environment, international market.

The number and range of devices and products for various purposes on the international market is increasing. The number of goods entering the territory of Russia from the near and far abroad creates serious competition for domestic producers. China is the undisputed leader in the mass production of industrial and civil goods. Every year, Chinese manufacturers increase the quality of their products, and due to mass production, they have a competitive cost. In addition, the material well-being of Chinese citizens is increasing and they, in addition to the global supplier of products, are becoming a promising market for products from other countries.

During my school years, I often had to visit China with my parents. Having visited many different resort and industrial cities, it was hard not to notice that jade is the national stone of this country. Jade in China is found as jewelry and decorative items, as elements of enclosing structures and as a heat transfer surface of heating devices. One of the suggestions for tourists in China is "visiting the jade baths".

All products where jade is installed are in special demand in China, despite the high cost. Plates of various sizes are installed in the products, which have a uniform color and do not have any surface damage. In the Irkutsk region there are enterprises that use jade in their production, and which have a large amount of waste, the so-called "non-business" jade.

In 2021, I entered to study for the specialty "Technologies of Artistic Processing of Materials" and decided to conduct research in the field of applying jade coating to various metal products that are used in mechanical engineering.

Previously, I have identified the competitive advantages that will appear in products with a jade coating:

- Jade has good heat capacity, keeps heat for a long time, evenly distributing it over its surface. Accordingly, jade-coated products can create a favorable temperature balance in rooms, heating up during the day and gradually giving off heat in the evening and night hours.
- Jade is a natural filter against negative external thermal effects and has been used since ancient times to optimize the circulation of thermal energy in the human body [1].
- Due to its natural characteristics, jade emits thermal energy in the frequency range favorable for the human body, thereby creating a healthy and environmentally friendly environment [2].
- Jade is widely used in therapeutic equipment for the treatment of various diseases [3], respectively, all jade-coated products for advertising purposes can be called "Healing".
- Jade is one of the most common minerals used to optimize heat exposure and can be used for heat transfer surfaces in heating and thermoelectric systems. It is resistant to tests, has high strength, has good dielectric characteristics, and has antiseptic properties [4]. Accordingly, this coating will create favorable thermal comfort and, at the same time, retain its properties during long-term use.
- In the manufacture of building envelopes, jade is used for a positive biostimulating effect. Scientists have proven that architectural ensembles made of stones, intended for contemplation, normalize the psychological state [5], this method is used in the sanatorium "Grove", located near Kharkov [6]. The buildings and structures where this coating will be used will have a calm and friendly atmosphere.

These advantages can only be obtained if, when applied to the jade surface, such a structure is created in which the coating will give the same spectral analysis as an intact whole plate.



Fig. 1. Jade coated specimens.

At our University, work is underway to apply a dielectric coating on metal surfaces with borosilicate glasses [7] by pneumo-electrostatic method. Jade, like glass, is a dielectric, but under the influence of temperature it does not melt and it cannot be restored to its original state by thermal action. Therefore, for application, I use a mixture of jade powder and low-melting borosilicate glasses, fig. 1 shows the first samples that were made in this way. Visual assessment and mechanical impact on the applied surface showed that the coating has an attractive appearance, does not wear off and it is possible to create ensembles with different combinations of colors.

I will continue my research in this area so that it becomes possible to create decorative coatings for a healthy environment and to increase the competitiveness of products from Russian manufacturers.

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