

Mixed technologies of artistic ceramics processing for the jewellery manufacture

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Abstract. The need for the study of different technologies of the jewellery manufacture is due to the demand of the modern world in a variety of high-quality environmentally friendly products. While working with ceramics, it is possible to get the product, which is unique in its form, a wide range of colors, possibility of harmoniously combining it with a number of other modern materials. Images of ancient birds are used, stages of technology, which allow connecting the ceramics and metal, the technology for working with underglaze paints are represented, application limits associated with a particular operation of the product (fragility) are analyzed in the research. The society need for exclusive products determines the relevance of different materials connection, the characteristics research of their compounds, while working with them. The research objective is a bird image stylized design for a piece of jewellery, different materials compounds, the substantiation of technology of its manufacturing “narikomi” technique. Also, the research objective includes the development of the technology stages, allowing the connection of ceramic and metal to get jewellery that is unique in its form, a wide range of colors, a possibility of harmonious combination of it with a number of other modern materials.

1. Introduction

A magical function (“amulets”) was the jewellery primary function in all nations. Amulets provided protection against evil spirits, dangers to those who wore them. The second function was decorative, as an expression of aesthetic needs, self-affirmation, desire for a beauty. The next function could be called as socially distinctive; it means that jewellery was a sign of social distinction, a sign of material well-being and creditworthiness, a rational method of material resources. Women jewellery was kept as arelic, handed down from mother to daughter for generations.

We are going to match these functions all together in this research. We choose the image of future product and fill it by some symbolism (fig. 1). We have a look at the bird image and symbolic meaning. Nowadays a lot of things which were significant early are forgotten, for instance, a bird. The bird image became significant among the eastern Slavs and it reached up to now, changing in conjunction with customs and a culture.





Figure 1. Design stages: a– the sketch, b – the sample.

A bird is an ancient symbol of imperishable, soul, spirit, divine manifestation, air spirits, spirits of the dead, ascension to the Heaven, ability to communicate with gods or go into a higher state of consciousness, thought, imagination. Great birds as an ancient symbol are often identified with solar deities, gods of thunder and wind. Their tongue is considered as lightning. Birds are a part of the tree symbolism: the deity power descends into the tree or its symbol - the trunk. The samples of relief birds performed by the folk motives are represented in Figure 2.



Figure 2. Stylization of ancient Russian folk images in ceramics: a – "Sirin" bird, b– "Alkonost" bird

The unique technology that connects various traditions of artistic ceramics and metal was developed for "Bird" ring manufacture.

Different materials are used for this purpose:

- metal- cupronickel – the base
- copper – bird wing
- porcelain - bird figure.

The manufacturing process involves working with bisque (glazed surface) in the "narikomi" technique (Japanese technique of clay colored masses mixing (in this case - white porcelain) with color pigments). The bird body is decorated with colored enamels in Figure 3 (the colors used: blue and lilac). Metal parts, imaging wing and legs, are attached by soldering.

Porcelain in "narikomi" technique is used in figure 3. Manufacturing technology involves working with porcelain bisque (unglazed surface) in "narikomi" technique.



Figure 3. A “Bird” ring: a – front view, b – back view.

2. Technique

Narikomi firstly appeared in ancient Egypt (while ceramic jewellery was created), in China and Japan; the English learnt this technique from Romans. Italian artists were one of the first who learnt how to work with underglaze paints in ceramic at the end of the 15th century. They found a majolica painting technique. The technique laid in the fact that ceramic paints and glaze were plotted on crude enamel and were ablated simultaneously with it. Such painting differs by mild colorful coloring, saves tenuous image details, which has pleasant blurred contours after baking. This technique has started arousing interest in Russia only recently. There is a different meaning – agate loam (named after the stone - agate). A distinctive feature of this technique is a combination of different clays in fantasy patterns in one product. Various metal oxides are injected into the white clay, the basis. Then the color clay is cut into layers, stacked on each other in a certain order and pressed. Beautiful pattern is obtained by cutting the formation. It can be chaotic. It also possible to create an elaborate structure and solve different color palette (fig. 4). Clay itself contains an incredible beauty!

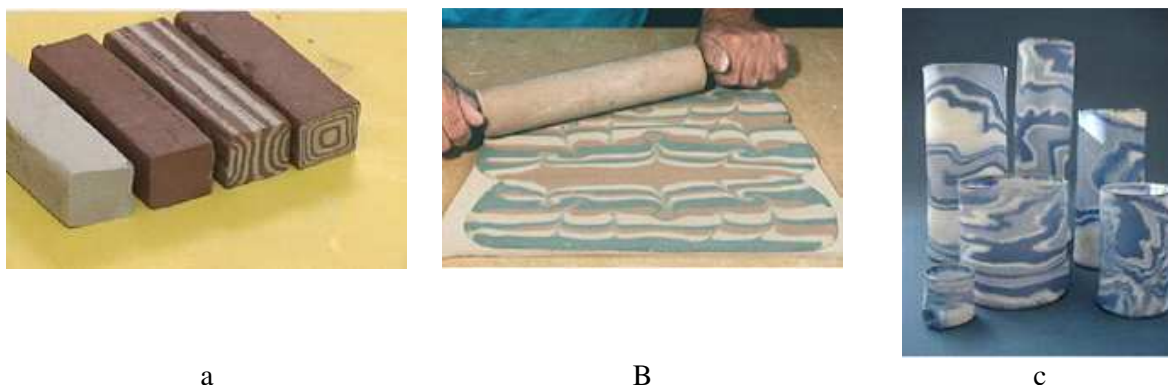


Figure 4. A working process with agate clay: a – combination of different clay types; b – agate clay layer; c – finished products.

3. General characteristics of underglaze painting

A decor is laid off the unglazed surface of ceramic ware by colors, after it was glazed and fired based on the underglaze painting technique. There are several methods of underglaze painting: a painting on scrap (past primary burning - 700 degrees); a painting on crude material as in our case (fig. 4a). The majolica painting technique is performed on crude enamel. Painting of a “Bird” plaque on crude white enamel is made by salts - liquids (cobalt nitrate $\text{Co}(\text{NO}_3)_2$) and underlay paints (pigments). Such painting required accuracy and workmanship, since corrections are not desirable. Painting is made by cobalt salt; after that, underglaze paint is laid on the top of the brushstroke to make painting more expressive and volumetric.

The product is purged from the top by a colorless glaze and fired at 1050 degrees. Paints are fused into the upper layer of enamel during the firing process. Underglaze painting is more durable and strong, as it is preserved under a layer of glassy glaze. Underglaze paints are a mixture of glaze pigments (there are 20-50% of glaze typically) and other materials. These supplements help to increase the mass viscosity and better conformity between paint, shard and glaze. Colors samples for products are made at a given shard at the required temperature with colorless glaze before the work. Paints are diluted with water on a glass, that is, they are pulverized with a spatula with a few drops of glycerin until obtaining smoothness. Water is added to the painting process as needed. Paint must be resistant to high temperatures actions, to the flux and glaze actions during the process of glaze firing. Paints use should be economically beneficial. Defective painting can be corrected by glaze painted at lower temperatures from 720-900 degrees.

4. Conclusion

Ceramic jewellery is widely used in industry, although it is rough at first sight. However, it is possible to create truly elegant and simple decoration out of ceramic due to unique technologies. Despite its fragile appearance, the jewelry obtained is very strong and has chemical resistance to environmental influences. So jewellery does not spoil, ceramics does not fade and does not lose luster over the years.

The jewelry made of ceramics cost is much lower than the cost of the jewellery made of precious, semi-precious metals and stones. Moreover, ceramic jewellery does not yield to other jewellery, as it is based on originality, the unique range of used colours and a huge variety of forms and combinations with different materials. It is possible to reach a unique colour if we use ceramic jewellery with colouring addition. Based on that, ceramic jewellery is a very bright and original product, which underline individuality, beauty and the discriminating taste of its owner.

Methods of ceramic processing allow making it very gentle and smooth to the touch. That is a definite pro, when you make a choice of jewellery resting on tactile perception. Ceramic is light as well, so, even large-sized products have little weight. One more significant advantage of ceramic is that it is a hypoallergenic material, which does not cause any rejection, and its contact with skin is proper. Therefore, this jewellery could be worn even by people who are sensitive to metals. The risk of allergic reactions to ceramic product is minimal.

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