

## **Decorative formulations for the surface of ceramic products to achieve an aesthetic quality**

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### **Research Summary**

The art of ceramics is one of the arts that almost no human civilization has practiced, as it is one of the traditional arts that embodies the social and psychological aspects of its makers, as the ceramic form has been distinguished from ancient times until our modern time with aesthetic components, and it is also one of the most important artistic crafts practiced by the Arab artist for a long time which contributed to the realization of the idea of Islamic civilization in multiple aspects, and the important centers in the first Abbasid era were Baghdad, Samarkand and Fustat in the Fatimid era, and Iran in the Seljuk era, where the potters in the sixth and seventh centuries Hijri reached an advanced stage that is considered perfection. Whether it is in the methods of manufacture such as metallic luster of one color or multi-color, or in the way of decorating the utensils with decorative units engraved or prominent and stereoscopic, and the hollow decorations of the raw materials used in them, as well as the types of ceramics according to the different style of manufacture, or according to the decorative style that painted on it or the coating material on which the ceramic pieces were painted. Clay is the backbone of ceramic art, and this material is characterized by the property of formability if mixed with water. The result is as if it is waiting for formation, and when the mud dries up it is of solidity where it can be carried, while fire gives the shape a strong form of stamina and solidity, and it does not return to its initial state unless it was wetted with water in the stage before the fire, and although the mud is everywhere on the surface, except that it often differs in its properties, some of which are perfectly suitable for ceramics, and are in its natural form, while others need to be mixed with suitable elements in order to be used. Ceramic units are made of white clay which is less durable and prone to breakage in most cases. Among other raw materials, except that it specializes in other features that qualify it to be superior to others in the field of artistic creativity, due to the plastic aesthetics that characterize its natural appearance as well as the richness of its colors and its surface value, its low cost and ease of obtaining it, and the deficiencies that may be characterized by mixing them can be overcome, with other materials that are more solid, durable and lighter.

The ceramic forming methods vary according to the work carried out. The slices method is one of the most suitable methods in building flat ceramic shapes. It is a flat piece of "flexible, coherent clay that has not dried". It can be adapted to be of a simple shape or just a delimiter of lines and dimensions, or with a free shape that is capable of producing different effects and surface touches on it with various elements, and this step can be practically done by creating a potter for a different shape.

The potter artist can also obtain many and varied surface effects and touches through clay slices that are placed on their surfaces to have attractive tactile effects by using rough

surfaces, or surfaces consisting of sunken and prominent parts, such as: cardboard, fork, or spool of thread , or coarse fabric, such as burlap, loofah, metal wire, plastic or fabrics (such as mound, lace, Chloe), tree fibers and leaves of various plants, and by using the artist potter of one of these elements, he can create an effect similar to the chosen element on the clay surfaces of the contacts of these surfaces.

The decorative arts were present in all periods of art history in general, either through the solitary form or in conjunction with other arts, especially architecture, and in many cases it was a specific historical period such as Byzantine, Islamic or Gothic art, so that it could not be appropriately evaluated, without this kind of work, and in other cases, especially in nomadic cultures, it is the only kind of artistic achievement that these peoples undertake, as in the case with the Germanic peoples that invaded the Roman Empire, and in many other cultures. Decorative arts had a similar status to the rest of the arts, as in Greek or Chinese ceramics, the close relationship between the decorative arts and popular culture, which was often a major medium of expression in this medium.

It is indisputable that the technological and industrial revolution that took place in the developed world has a clear impact on the creativity of artists in general. With the development of the modern era, the artist has become in need to develop the ceramic product, in terms of form and design, through his development of manual performance and techniques for this production, which has an influential role in the enrichment and quality of the ceramic shape.

Some have viewed quality as sharpening efforts and investing energies to improve the administrative approach and its specifications, and some argue that comprehensive quality means efficiency, while others see it expressing effectiveness, but we can say that it includes efficiency and effectiveness together, because efficiency means the optimal use of the available capabilities. In order to obtain a specific amount of output, using the lowest amount of input, and this represents taking the foundations on which comprehensive quality is based, which is to achieve the required specifications in the best way and with the least effort and cost, so you define quality as an integration of the characteristics of a product or service, in a way that enables it to meet specific needs and requirements, or it is a set of characteristics and features of an entity, that expresses its ability to fulfill the requirements specified or expected by the beneficiary.

Perhaps the interest in the quality of production started with the beginning of the human learning of the handicraft, and this interest increased with time, and with the multiplicity of competition between individuals and countries as well, this led to the work of precise requirements in products, and this accuracy continues to develop with the development of measuring devices, as others see that controlling the production quality is the plastic processing of the ceramic product using the decoration, the overall quality depends on the human performance technology, the quality of the material technology and the quality of the material.

Linings are the clay made of the body made in addition to colored oxides, where they are mixed together, then mixed with water and the mixture is filtered well, then we paint with the models to be colored while they are in the state of flaking, the coloring with colored clay liners is considered one of the oldest methods used by potters since ancient times until our time .

There are glazed linings, which are a type of linings developed in modern ceramics, which are colored clays added to them with some melting aid to increase their hardness, as it is possible to prepare clay linings installations so that they become dense and similar to glaze, and this type is called glass clay linings.

Perhaps the plastic treatment of the ceramic product using glass coatings is one of the important stages, as the coatings can be classified according to the degree of transparency, luster, color, texture ..., and under each of those properties there are different types of coatings.

The treatment is according to the degree of transparency of the coatings with a variety of textures and colors, even those that do not contain opaque substances are opaque within themselves, as the coatings that have not reached the degree of maturity are opaque due to the incomplete melting of the components of the paint, in addition to the presence of bubbles trapped in the paint that lead to its opacity There is the transparent glaze, which is a colorless glass paint, and it is characterized by the fact that after maturity, the color of the pottery body appears under the surface of the glossy glaze, the semi-opaque paint, and it is considered one of the most beautiful coatings, and the semi-opaque coatings reveal and partially obscure the linings or clays underneath in an interesting way, despite they are difficult to control, they are commonly used with studio potters, they are of limited use in industry, opaque paints obscure what is underneath, and opaque paints can arise either from the paint itself or from the presence of opaque materials in the paint, such as the addition of tin oxide, to the transparent coating to become opaque, as in "Delft" ceramics, and to achieve opacity, opacity must be added, and one of the most opaque materials to be used is "tin oxide and zirconium oxide", and usually tin oxide and zirconium are added. Zirconium to the base of the paint, and tin oxide is the best material to use as an opaque material.

As for semi-opaque coatings, they can be obtained by adding sufficient opacity to make the paint dark without making it completely opaque. The thickness of the coating layer and the temperature of the fire can be considered as catalysts in semi-opaque coatings, if the paint is applied thickly.

Salt glaze is a glass coating that is made by throwing table salt into the oven after ceramic figures have matured in the oven, and the sodium combines with the silica inside the body, and a glassy substance is composed of sodium alumina silicate, it is preferable to add fine sand to the clay that the body is made of, in order to get better salt glaze, cracked glaze, and this type of coating gives decorative effects that enrich the aesthetic value of the artwork, which occurs as a result of the difference in the expansion coefficient between the glaze layer and the surface of the ceramic body, resulting in cracking in the glaze.

As for the treatment according to the degree of gloss and extinguishing of the surface of the coatings, it can be of high or low gloss, and the surface of the paint is shiny when melt, while it is matte and opaque if the paint does not mature, how to obtain a good extinguishing of the surface of the coatings, the best results of the matte paint can be obtained when crystals form on the surface of the coating, these crystals are usually zinc, calcium, magnesium, or titanium silicates, which are produced by adding zinc oxide, limestone, wollastonite, dolomite, or titanium oxide to the paint composition.

Crystal glass coatings and these coatings are distinguished by being bright, as they include crystals that are embedded in the glass paint or on its surface, and the cooling rate is very important for the growth of crystals, and therefore the oven temperature should be reduced to about 100 ° C, then the temperature is fixed at the new temperature for several hours, then the cooling continues slowly, as the crystalline glaze itself does not consist of crystals, but rather grows through the glaze's composition.

Texture is one of the important elements in the evaluation of the artwork, especially the ceramic, and the texture plays an important and vital role in the perception process of the surface of the ceramic body, and the texture can be mainly attributed to the aesthetic function of shapes, textures of ceramic surfaces vary from very high smoothness to severe roughness, and between smoothness and roughness there are many different textures, among which are the factors that affect the texture in ceramic objects, the shape of the granules used, the degree of density, closure, or bundles of the total mass, the size of the granules, and the method of distribution of these grains.

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