

TRANSPARENT GLAZE FOR CALLIGRAPHY PLAQUES AND USE THEREOF IN ENAMEL CALLIGRAPHY PLAQUES

TECHNICAL FIELD

[0001] The present application belongs to the technical field of new materials, and relates to a glaze slurry for calligraphy plaques, and in particular to a transparent glaze for calligraphy plaques and use thereof in enamel calligraphy plaques.

BACKGROUND ART

[0002] The previous plaques are basically made of wood, paper mounting frames, aluminum-plastic panels, etc. These materials have disadvantages such as poor preservation, difficult cleaning, susceptibility to deformation, and easy fading.

SUMMARY

[0003] In view of this, the present application provides a transparent glaze for calligraphy plaques and use thereof in enamel calligraphy plaques.

[0004] It should be noted that compared with traditional plaques, enamel calligraphy plaques have the excellent properties of enamel, such as good weather resistance, wear resistance, scratch resistance, high hardness, corrosion resistance, bright and fadeless colors, and easy cleaning. Compared with traditional enamel products, it has also the cultural attributes endowed by artistic calligraphy and paintings. The two are combined with and complement each other, and the fusion of two traditional things can better reflect the beauty of classical Chinese culture.

[0005] In order to achieve the above object, the present application adopts the following technical solutions.

[0006] The first technical purpose of the present application is to provide a transparent glaze for calligraphy plaques, which is mainly composed of the following raw materials in parts by weight: B_2O_3 6~8%, Na_2O 19~20%, Al_2O_3 4~5%, SiO_2 40~41%, PbO 20~21%, TiO_2 7.5~8.0%, and MoO_3 1~1.2%.

[0007] It is worth noting that the present application reduces the titanium content to reduce the opacity of the ceramic glaze itself and increase its transparency, and

simultaneously increases the sodium oxide content to reduce the melting point, so that it can be fired at a low temperature, thereby reducing the influence of high-temperature firing on the calligraphy content on the bottom.

[0008] Moreover, various effects of the upper-layer ceramic glaze on the plaque may be designed according to the content of calligraphy. For example, the surface of the plaque in a bustling tourist area needs to be glossy and vibrant, so a high-gloss glazed plate may be used; for the plaque in a temple, a matte and muted glazed plate may be used; and for the plaque in a small cottage in the woods, a relief-layered glazed plate may be used. The glaze upper layer does not overshadow the intrinsic charm shown by the calligraphy, but rather further enhances the cultural artistic conception of the entire plaque through the combination of interplay of luster and spatial depth. It may also highlight the matte and muted textual content on the glossy and vibrant ceramic plate, such that the text is clearly visible under different lighting conditions. It has complex and diverse shapes, and although different from traditional cultural plaques, plaques of various complex shapes may also be made, easily adapting to the ever-changing artistic appreciation.

[0009] The second technical purpose of the present application is to provide a use of the transparent glaze for calligraphy plaques in an enamel calligraphy plaque.

[0010] Optionally, the enamel calligraphy plaque is made by spraying the transparent glaze for calligraphy plaques on an enamel calligraphy base plate, drying and firing.

[0011] Further, the transparent glaze for calligraphy plaques has a spraying thickness of 30-60 μm , a firing temperature of 790°C, and a firing time of 4 min.

[0012] Further, the spraying has following process parameters:

[0013] a bulk density of a glaze slurry of 140~155 g/cm³, a spraying air pressure of 0.3~0.6 Mpa, and a gun distance of 250-500 mm.

[0014] Further, the glaze slurry is composed of following raw materials in parts by weight:

[0015] 100 parts of transparent glaze for calligraphy plaques, 0.1 parts of methyl cellulose, and 50 parts of water.

[0016] The beneficial effects of the present application are as follows: the ceramic surface of the enamel calligraphy plaque made by using the transparent glaze for calligraphy plaques of the present application is delicately textured, and has high transparency, good flatness, strong sense of layering, and strong visual effect.

DETAILED DESCRIPTION OF EMBODIMENTS

[0017] The technical solutions in the embodiments of the present application are described clearly and completely below. Apparently, the described embodiments are only some, not all of the embodiments of the present application. Based on the embodiments of the present application, all other embodiments obtained by ordinary skill in the art without creative work fall within the scope of protection of the present application.

[0018] The term “embodiment” as used herein refers to any embodiment described as “exemplary” and should not be construed as superior to or better than other embodiments. Unless otherwise specified, the performance index tests in the embodiments of the present application are performed using conventional test methods in the art. It should be understood that the terms described in the present application are only used to describe particular implementations and are not used to limit the content disclosed in the present application.

[0019] Unless otherwise specified, the technical and scientific terms used herein have the same meanings as commonly understood by ordinary technicians in the technical field to which the present application belongs. All other experimental methods and technical means not specifically specified in the present application refer to experimental methods and technical means commonly used by ordinary technicians in the art.

[0020] In order to better illustrate the content of the present application, numerous specific details are provided in the specific examples below. It should be understood by those skilled in the art that the present application may also be implemented without some specific details. In the embodiments, some methods, means, instruments, equipment, etc. well known to those skilled in the art are not described

in detail in order to highlight the main purposes of the present application.

[0021] Without conflict, the technical features disclosed in the embodiments of the present application may be combined arbitrarily, and the resulting technical solutions belong to the contents disclosed in the embodiments of the present application.

[0022] Example 1

[0023] A transparent glaze for calligraphy plaques was mainly composed of the following raw materials in parts by weight:

[0024] B₂O₃ 6%; Na₂O 20%; Al₂O₃ 4%; SiO₂ 40%; PbO 21%; TiO₂ 7.8%; and MoO₃ 1.2%.

[0025] Example 2

[0026] A transparent glaze for calligraphy plaques was mainly composed of the following raw materials in parts by weight:

[0027] B₂O₃ 6%; Na₂O 19%; Al₂O₃ 5%; SiO₂ 41%; PbO 20%; TiO₂ 8%; and MoO₃ 1%.

[0028] Example 3

[0029] A transparent glaze for calligraphy plaques was mainly composed of the following raw materials in parts by weight:

[0030] B₂O₃ 8%; Na₂O 19%; Al₂O₃ 4%; SiO₂ 40%; PbO 20%; TiO₂ 7.9%; and MoO₃ 1.1%.

[0031] In order to further demonstrate the beneficial effects of the present application and to better understand the present application, the technical features disclosed in the present application are further illustrated by following comparative examples and experimental examples, but should not be understood as limiting the present application. Other improvements made by those skilled in the art based on the above disclosure without creative work are also considered to fall within the scope of protection of the present application.

[0032] Comparative Example 1

[0033] B₂O₃ 5%; Na₂O 15%; Al₂O₃ 2%; SiO₂ 35%; PbO 25%; TiO₂ 10%; MoO₃ 5%. After the glaze slurry was sprayed and fired, pinholes appear on the surface.

[0034] Comparative Example 2

[0035] B₂O₃ 8%; Na₂O 17%; Al₂O₃ 2.5%; SiO₂ 30%; PbO 20%; TiO₂ 10%; and MoO₃ 3%. After the glaze slurry was sprayed and fired, it is not transparent enough due to high opacity.

[0036] Comparative Example 3

[0037] B₂O₃ 7.5%; Na₂O 17%; Al₂O₃ 2.5%; SiO₂ 38%; PbO 20%; TiO₂ 9%; and MoO₃ 3%. After the glaze slurry was sprayed and fired, the surface exhibits an orange peel texture.

[0038] Experimental Example 1

[0039] The formula of the transparent glaze KE009 for calligraphy plaques included the following components:

[0040] B₂O₃ 7.5%; Na₂O 19%; Al₂O₃ 4%; SiO₂ 40%; PbO 21%; TiO₂ 8.0%; and MoO₃ 1%.

[0041] Test materials: Enamel calligraphy base plate special transparent glaze
KE009 enamel plate transparent glaze 6108

[0042] Test process:

[0043] 1. Glaze slurry preparation

[0044] The enamel base plate was made by preparing a white plate as the base by an electrostatic dry method and then performing calligraphy ink drawing. Two transparent glazes were sprayed on the base plates respectively, and fired to obtain sample plates for comparative testing:

[0045] (1) The preparation formula of a wet glaze slurry No. 1 included:

[0046] KE009 100%, methyl cellulose 0.5% and water 50%; and grinding coarseness was 0.05-0.1 g (140 mesh sieve residue), making the ceramic surface more delicately textured; and

[0047] (2) The preparation formula of a wet glaze slurry No. 2 included:

[0048] 6108 100%, MCV076 0.6%, 3020 2%, sodium nitrite 0.3%, and

[0049] water: 50%; and grinding coarseness is 0.1-0.2 g.

[0050] 2. Spraying and making the base plate

[0051] The prepared glaze slurries were each sprayed on an enamel calligraphy

base plate, with a thickness of 30-60 μm , dried and then fired at 790°C for 4.0 min, to obtain the enamel calligraphy plaque plate, and the ceramic surface effects were observed and compared.

[0052] Spraying precautions:

[0053] The bulk density of the glaze slurry is controlled in the range of 140 $\text{g}/\text{cm}^3 \sim 155 \text{ g}/\text{cm}^3$.

[0054] For the glaze slurry raw material with poor flowability, in order to prevent occurrence of the problem of orange peel texture, the spraying process was adjusted accordingly, in which the gun distance remained unchanged, but the air pressure was changed and set to be 0.3~0.6 Mpa.

[0055] Test data and analysis:

[0056] When the bulk density of the glaze slurry is controlled at 140 $\text{g}/\text{cm}^3 \sim 155 \text{ g}/\text{cm}^3$, the glaze slurry No. 2 has high flowability, resulting in occurrence of partial sagging during spraying.

[0057] 3. When the thickness of the ceramic layer is 30-60 μm , the transparency of the ceramic layer No. 1 is significantly better than that of the No. 2, and the thicker portion of the No. 2 is partially covered with white coverage.

[0058] It can be seen that the transparency and operating performance of the special ceramic glaze KE009 for enamel calligraphy plaques are significantly better than those of the existing silk-screen enamel transparent glaze. Combined with the adjusted process, enamel calligraphy plaques with better effects can be produced.

[0059] Experimental Example 2: Mixing Ratio for Calligraphy Text Colors

[0060] In order to make the background of the plaque coordinate with the environment, it is necessary to adjust the pigment ratio in time to make the color harmonious with the surrounding environment. The pigment ratio may also be adjusted to make the sample color brighter or understated to meet customer's needs. The ratio of oil to pigment may be adjusted (1:0.8) to make the color more translucent. The ratio of oil to pigment may be adjusted (1:0.5) to make the color more opaque. Other textured oil materials (concave-convex oil material) may be added and the ratio

is adjusted to make the layer show a textured effect (concave-convex effect) to enhance the three-dimensional sense of the pattern.

[0061] The ceramic surface of the enamel calligraphy plaque produced according to this process is delicately textured, and has high transparency, good flatness, strong sense of layering, and a strong visual effect.

[0062] The above description of the disclosed embodiments enables one skilled in the art to implement or use the present application. Various modifications to these embodiments will be obvious to one skilled in the art, and the general principles defined herein may be implemented in other embodiments without departing from the spirit or scope of the present application. Therefore, the present application will not be limited to the embodiments illustrated herein, but rather conforms to the widest scope consistent with the principles and novel features disclosed herein.

CLAIMS

1. A transparent glaze for calligraphy plaques, comprising following raw materials in parts by weight: B_2O_3 6-8%, Na_2O 19-20%, Al_2O_3 4-5%, SiO_2 40-41%, PbO 20-21%, TiO_2 7.5-8.0%, and MoO_3 1-1.2%.

2. Use of the transparent glaze for calligraphy plaques according to claim 1 in an enamel calligraphy plaque.

3. The use according to claim 2, wherein the enamel calligraphy plaque is made by spraying the transparent glaze for calligraphy plaques on an enamel calligraphy base plate, drying and firing.

4. The use according to claim 3, wherein the transparent glaze for calligraphy plaques has a spraying thickness of is 30-60 μm , a firing temperature of 790°C, and a firing time of 4 min.

5. The use according to claim 3 or 4, wherein the spraying has following process parameters:

a bulk density of a glaze slurry of 140-155 g/cm^3 , a spraying air pressure of 0.3-0.6 Mpa, and a gun distance of 250-500 mm.

6. The use according to claim 5, wherein the glaze slurry is composed of following raw materials in parts by weight:

100 parts of the transparent glaze for calligraphy plaques, 0.1 parts of methyl cellulose, and 50 parts of water.