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Discussion on the stoneware production techniques and methods (molding)

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Abstract: The status of stoneware in the ceramic circle is irreplaceable, and stoneware is not burnt like other porcelain, but to form a mass production line, stoneware burning process and methods are particularly important at this time.How to ensure quality under the premise of mass production has become the key to stoneware production.Shaping is the beginning and key step of stoneware production.

1. What is stoneware

Stoneware is a type of pottery.Pottery can be broadly classified into four categories: earthenware, stoneware, earthenware, and porcelain.Soil: rough and loose billet, porous, unclean color, the lowest degree of fire into the pottery, with water absorption.Sound coarse and short rhyme, such as bricks and tiles bowl; Stoneware: It is dense and hard, natural clay color, with a fire temperature between 1140℃ and 1280℃. It is non-absorbable and has a coarse sound and long rhyme, such as purple sand earthenware.Pottery: the billet is also fine, glazed, high fire into pottery, water absorption, sound coarse and short rhyme.Porcelain: dense and transparent billet, glazed, the highest degree of fire into pottery, no water absorption, clear sound and long rhyme.Stoneware is a type of porcelain, pottery that is so glassy (i.e. similar to glass that liquid cannot permeate) that it is burnt at temperatures of around 1,200℃.Because stonewares are dense, they are glazed only for decoration.Originated in China around 1400 B.C. and exported to Europe in the 17th century, stonewares, ranging from red to dark brown, have been copied and imitated in Germany, England, and Holland.

2. Shaping process among the eight stoneware crafts

Stoneware production is roughly divided into eight processes: ball milling, model preparation, mechanism, clean embryo, painting, glazing, firing, and picking and packaging.Different raw material ratio, different mud making method and mud material ratio, different glaze has a great influence on the final firing effect.The eight technologies can be roughly divided into molding, processing, burning into three plates.

2.1 Purpose and operation requirements of ball milling process

Objective: to grind the raw material into mud and glaze according to a certain proportion, so as to prepare for molding and processing.

Operating requirements:

When batching, all kinds of materials of one mill should be neatly stacked in front of the mill and matched with another mill. The materials of each mill should not be crossed or mixed.The ball stone should be regarded as a raw material, according to the wear amount of each grinding with the ingredients into the grinding, not every few grinding.Add water accurately according to the ratio of material to water 1:0.65 (machine-made mud material).It is generally guaranteed that the slurry concentration is above 75 degrees and the slurry surface is about 30 cm away from the inner surface of the grinding mouth.Grinding cover and liner should be pressed tightly and flattened.The "eye of the wind" plug is tight to prevent slurry leakage after starting the machine.After installing the mill, the field around the ball mill should be cleaned up and tidy in time.After starting the machine, observe the ball mill for 2-3 minutes, and then leave the ball mill after normal operation, and fill in the operation record of the mill in detail and accurately.Before grinding, the ball grinder shall take samples from the mill one hour in advance according to the normal grinding time and hand them over to the relevant personnel to measure the fineness of the grinding mud. If the fineness is not qualified, the grinding shall not be allowed, so as to avoid ultra-fine or non-fine grinding of the ball mill.Put the water to run for 2-3 minutes after the grout, the grout valve should be hit at the bottom of the mill.After putting out the pulp to 100-200kg of water washing and grinding, running for 2-3 minutes pumping and then loading.The mud shall be passed through the specified sieve into the specified slurry basin.Pay attention to the mud can not overflow screen, screen damage to be replaced in time.The proper flow of mud from the slurry tower to the shaker should be controlled to achieve optimal iron removal.Clean the iron absorbed on the magnetic bar in time.Add water to glaze mill according to 1:0.6 (material to water ratio).Ensure the grinding concentration above 70°.Glaze can be dipped in 12 hours in advance of trial firing, test burning pieces without being burnt to see not put grinding.

2.2 Purpose and operation requirements of model preparation process

Purpose: Model preparation is the basis of molding operation, and the model is formed by reversing the mold.

2.2.1 Tire making and injection mold operation procedures

According to the established drawings, the physical model for the tire.After the mother is made, a layer of varnish should be applied. When the varnish is modulated, the varnish should be divided into several times.The proportion of banana water and paint should be appropriate. The paint should be divided into several times to dig out the concave tire and mold tire according to the size of the mother fetus, and prepare the casting model.When casting the model, the surface of the die tire must be smooth and smooth, and the tire sleeve must be consistent and tight.Gypsum slurry to mix evenly, gypsum: water = 1.4:1.The gypsum paste shall be screened before use and surface dirt shall be removed.When pouring gypsum slurry, it should be poured from one direction to slightly higher than the mold.Scrape the mud from the film tyre.When the gypsum slurry solidifies and heates, the tire cover can be taken off, and the mold tire cover can be wiped: the floating water on the surface, the oil tire is rubbed evenly, in order to continue pouring, and the model should be trimmed and dried.

2.2.2 Tire turning process

Before turning the tire, check whether the data of various scales specified in the process notice is consistent with the original actual data. If any discrepancy is found, report to the technician of the workshop immediately and deal with it as soon as possible.The concave tire must be made on the original tire and is not allowed to be duplicated on the production tire.Water and gypsum used for tire making must be weighed and not estimated to be used.Paint should be uniform, paint layer thickness should be consistent, and the body is smooth and flat.Gesso powder is being used when, want to soak

in the water inside the bucket thoroughly, pass vacuum agitate next just accurate use.The old tire coat should be made with iron rings to reinforce the coat.Rub the mould evenly, do not allow to leave agent marks.The concave tire and the old tire must be placed in a flat place, and the mud fulcrum on the bottom of the tire. The mud fulcrum consists of six fulcrum points to form a pentagonal, that is, put into a ☆ shape, with a fulcrum between them to prevent the deformation of the tire body.Toilets should be placed single, not stacked stacked stacked, so as not to crush deformation.When making tires, 15-20% of 500# cement must be added in accordance with the regulations. (The cement must pass through a 14-mesh sieve.) Every slurry barrel used should be cleaned, and no residual gypsum slurry should be left.The copy of the old fetus should be strictly checked, to ensure that light, flat, no injury, no trace, neat edges and corners without much meat and test whether the deformation, unqualified fetal scrap.

2.2.3 Molding process

Clean the surface of tools and tools.In the old tire coat surface rub release agent to be uniform, do not leave agent marks and dose is too large.Gypsum powder is in use, want to soak thoroughly inside the barrel (1-1.5mm), stir through vacuum mixer next (1-1.5mm) just allow to use.Water and gypsum should be weighed accurately and not estimated when the mold is injected.The material ratio of the mould water is 1:1.75. The material ratio of the mould water is 1:1.45. The vacuum stirring time shall not be less than one and a half minutes, and the vacuum degree shall not be less than 0.096MPa.When injecting the model, the slurry should be poured slowly, and no noise should be heard.The skin brush should be used to undertake agitating exhaust after infusing gypsum slurry, when agitating, want light, lest injure tread and erase mold agent when pouring slurry to want to pour full, prohibit to be short of slurry, scrape superfluous gypsum flat scrape net.When casting the male mold, the hollow mold must be added (according to the specifications, not allowed to mix size) to reduce the weight of the model and save gypsum.When demoulding, we should pay attention to whether the solidification time (4-6 minutes) has been reached, and it is not allowed to force early demoulding to prevent mold destruction.After the model is molted, it is necessary to repair the mouth along the bottom and make their own work number, and wipe off the water droplets on the fetus gently with net gauze to avoid gypsum rust.After the male mold is molded, the working face should be buckled, and the paper should be added between the two molds to protect the die surface from damage. When replacing the coat, we must pay attention to the regularity, the mouth is tight, and the slurry phenomenon is not allowed.

3. Conclusion

Stoneware molding process is the prophase of the most important part in the processing, if the embryo made of deformation or other quality problems will lead to subsequent processing and firing appear problem, and quantity according to the requirements and matters needing attention carefully to complete each procedure is the basic requirement, reduce the waste of raw materials and artificial waste is the point of forming a big process.We hope that this process can provide a useful reference in the stoneware production process.

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