

Ceramic Brick with Improved Physical Warm in Parameters on a Basis of Forest Kindled Clays and Wastes of Manufacture

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Abstract—In the article are revealed the opportunities of reception of a ceramic material with improved by heat-physical the characteristics . The received laboratory results are recommended in manufactures of a ceramic brick.

Keywords—ceramics, porous, structures, containing wastes.

INTRODUCTION

In conditions escalating of rates of building industry and the application of new highly effective heat-shielding materials in Republic of Uzbekistan dictates on development and introduction of structures of walls of porous materials from ceramics. Before the manufacturers is sharp there is a problem of improvement of quality of wall ceramics and expansion of assortment of let out products. In connection with deficiency of qualitative clay raw material in regions by Aral the given problem can not be solved without application of sub-standard raw material. By one of the basic directions the reception of wall porous ceramics is reduction of density at the expense of creation of porous structure of a material that allows to lower material capacity of manufacture and to increase a heat-shielding of walls. It is necessary to note, that at reception porous-hollow of wall ceramics of average density less than 800 kg / m³ on the basis of widespread forest kindled clay in technology arise set of problems [1]. To such problems it is possible to attribute:

- Difficulty reception of homogeneous weights and significant deterioration of formed properties of ceramic weights;

- Necessity of use of high-plastic clay of raw material;

- The preparation up to a super thin fraction of the burning out additive and their the high contents in weight, which reaches 30-40 % on volume of substance;

- Decrease of mechanical parameters of products.

It is known, that for manufacture of porous-hollow products of average density 800-1000 kg / m³ are suitable of clay, which contents of clay minerals to make not less than 30-35 % [2]. Such of clay in conditions by Aral is poorly widespread.

In this connection one of perspective directions of reduction of density painted ceramic products and increase of efficiency of technology is the use of forest kindled clay breeds, which are distributed enough in territory of Republic. By results of physical-chemical and technological tests forest kindled clays, as a rule, are characterized by complex mineralogical structure, they are low-crushed average-plasticized and have satisfactory forms, drying and burning in properties [3].

We in laboratory conditions develop the "know-how" of porous-hollow ceramic products of average density 750-850 kg / m³ and strength at compression 7,5-12,5 МПа on a basis forest kindled clays by a way plastic formation. As the additives is applied defect- a withdrawal of sugar manufacture. On technology, offered us, such decrease of average density of ceramic products is achieved by reception in time of burning small porous structure ceramic shard as a result of thermal decomposition of calcite and dolomite , contained in weight, and burning out thin tiny of the burning out additives entered into structure of ceramic weight. As the burning out additives are offered shortly fiber cellulose containing wastes from textile manufacture. Distinctive feature of products made on a basis of forest-kindled clays containing defect, is the formation in process of burning albite promoting high durability to parameters of ceramic materials. By a method X-ray phase of the analysis is established, that after burning of products at temperature 950-1050°C the formation of crystal phases anortite, diopside, crystoballit is marked. On tab. 1 are given average density of porous-hollow ceramic products from clay raw material with the various contents of calcite. By researches is

established, that for reception of porous -hollow products of average density less than 850 kg / м3 the contents of carbonates in clay raw material should make more than 10 %.

Table 1 Average density of porous-hollow ceramic products from clay raw material with the various contents of calcite

The total contents of carbonates in clay breed, mass. %	The contents in шихте of the burning out additives, weights. %	Average density of products, kg / м3 at emptiness	
		30%	40%
Up to 15	10	850	700-750
15-25	10	750	650 -750

Depending on given average density of products, and also from quantity of carbonate in clay breed, contents of the burning out additives in ceramic weight are recommended to enter 2-10 % on weight of dry substance. Is experimentally confirmed, that the ceramic weights with the specified contents of the burning out additives on sensitivity to drying are characterized as few - sensitive, that allows to intensificate the process of drying raw material. In regular intervals distributed in clay the burning out additives serve as volumetric arming a component, and thus, interfere with formation of cracks. In laboratory conditions the limits of components were made a number of samples varied in limits (in weights. %): forest kindled clay - 90-100, defects-2,0-10,0; the burning out additive - 2,0-10,0. In laboratory conditions process the reception of laboratory samples was carried out on traditional technology. Thus the forest kindled clay was dismissed in a vessel in limits a parity **ТВ:Ж**- 1:10 and from it the plastic part by known ways division of non-uniform systems is allocated. To dried up forest kindled clay were added previously dried up defects and burning out additive within the limits of 2-10 % by a step of a variation 2,0.

The humidifying was carried out by water. Skilled samples by the size 50x50x50 pressed on laboratory hydraulic press. Drying of samples was carried out at temperature 180 0C, burn at temperature 1000 0C. By known physical-chemical methods of the analysis by us is investigated of the basic physical-technical parameters of ceramic samples. The results of tests are given in tab. 2.

Table 2 The basic physical -technical parameters of ceramic samples

№	parameters and properties	sizes
1	Limit of mechanical durability at compression, МПа	7,5-12,5
2	Average density, kg / м3	750 -850
3	Limit of mechanical durability at a bend, МПа	1,3 – 4,0
4	Emptiness %	30-40
5	Factor of heat wiring, Вт/ (м°С)	0,141-0,176
6	Frost resistance, cycles	35-40
7	Water absorption %	14-30

Physical -technical properties of porous-hollow ceramic products

Thus, using of forest kindled clays containing defects and burning out cellulose containing wastes, are revealed the opportunities of reception of a ceramic material with improved by heat physical the characteristics The received laboratory results are recommended in the manufacture of a ceramic brick.

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