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ON THE ISSUE OF THE PRODUCTION OF PROTECTIVE CONTAINING CONSIST OF COMPOSITE MATERIALS CONTAINING MICROSPHERES.

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One of the priorities of sustainable development of agro-industrial complex is safety of agricultural production, increasing in productivity of production and improvement for quality of production. The efficiency of objects of agricultural activity is defined by many indicators, including operational reliability and durability of objects of agricultural construction that are constructed nowadays generally from frame and the frameless building constructions including sandwich panels which gained great popularity all over the world. The most rational solution of the problem of application of such designs for agricultural construction is to protect them by the coverings based on microspheres resistant to the corrosion environment arising in the process of agricultural production. In addition to it, the application of such protective coverings interfere with migration of harmful elements of agricultural activity to the environment of objects which activity forms the gases containing harmful substances and having an unpleasant smell (the systems of synthesis of biogas, system for agistered cattle breeding, silage and manurial systems) that will improve an ecological situation around these objects substantially.

According to the State Program of the development of agroindustrial complex of the Republic of Kazakhstan for 2017-2021 there is a problem of low level of technical and technological equipment of agricultural producers in branch [1].

The problem of increasing the level of technical and technological equipment is directly connected with operational reliability and durability of objects for agricultural purpose which have specific feature that is the operation at influence of the corrosion environment which is peculiar for agricultural technological processes. Necessary reliability and durability of designs can be provided due to complex protection of designs at their production and operation. One of the methods of secondary protection (in the process of using) is putting on a surface of designs of the protective coverings providing chemical and biological stability of designs for objects of agrarian and industrial complex. Nowadays those coverings are generally paint and varnish and mastic coverings on the basis of polymers, epoxy resin and polypropylene. The application of these coverings

is connected with certain problems. They are low durability at influence of shock loadings, cracking, chipping, a possibility of easy violation of integrity of a film of a covering at the increased humidity and aggressive influence that finally leads to fast aging of covering or full loss of its properties.

Therefore the search of the new technology solution and approach focused on exception of these shortcomings is a pressing question. One of the perspective directions of the solution of this question is application in protecting covers of objects of agricultural construction as a filler of hollow microspheres. Such coverings show an opportunity to increase adhesive power, resistance to thermooxidizing destruction, including hot surfaces, shock durability and durability on a chip. Using the hollow microsphere there is a possibility of receiving fire-resistant and chemically resistant protecting covers on a basis the bulging of polymeric materials. At the same time anticorrosive, anti-condensate paints and varnishes for complex protection of the surfaces exploited in atmospheric conditions of different climatic zones in case of the content of aggressive gases and vapors, in the environment with the increased humidity and big overfalls of temperatures are received. Using the hollow microsphere there is a sharp lowering of specific weight of a covering. [2-4].

The results of many works devoted to receiving hollow glass microspheres in recent years in literature are published [5,6-13]. The output of the American firm "Standard Oil Co" made from foam silicates of sodium and potassium [14] of the firm "Emerson and Cuming. Inc" is well known. Aluminous microspheres are used in the composites working at high temperatures (thermobarrier coverings). For decreasing viscosity of fusion of ceramic fusions in small amounts of SiO₂, TiO₂ are added. The main industrial manufacturers of aluminous microspheres are American firms "NortonCo", "CarborundumCo", the Japanese "Sebagenko" [5].

In our country the theory and practice of receiving the protective coverings resistant to corrosion environment using glass, ceramic, carbon microspheres wasn't developed. Nanotechnology wasn't developed either. There are heat-insulating and waterproofing coverings produced in Russia, Ukraine, they are "Penetron", "Izollat", "Arktik Kod", "Termodon", "Elastoplan". The universal protective coverings resistant to corrosion environment of agricultural production aren't available in the market of Kazakhstan. There are separate types of coverings for concrete floors (Temafloor), rubber coverings for cowsheds (Maximilk), protective coverings for metal (Tikkurila), awning coverings for cowsheds (Amikus). In Kazakhstan raw materials and materials aren't studied, theoretical, scientific and technical bases of receiving protective coverings using microspheres based on local raw materials aren't developed. In this connection, there is an urgent necessity of the fastest theoretical and experimental developments of technology in the field of protective coverings with microspheres.

Nowadays the construction sector of agricultural buildings and constructions in Kazakhstan and all around the world develops within the frame of application of the modern facilitated designs meeting requirements of sanitary and hygienic norms and standards of fire safety among them rural construction. [13-18]. At the same time the construction of facilities of agricultural purpose

(cowsheds, stables, hen houses, storages for vegetables, and etc.) has to be pre-fabricated in the conditions of the priority direction on sustainable development of the agro-industrial complex determined by increasing in volumes of agricultural production.

One of the main objectives of the State Program "Development of regions" is the development of rural territories, on condition of creating modern social, engineering and production infrastructure in main rural settlements, providing repairing and construction of facilities of housing-and-municipal and production appointment [19]. Within the frame of the Programs for the development of territories of the areas (Almaty, Karaganda, West Kazakhstan, North Kazakhstan, and etc.) including the development of main rural settlements and border villages modernization and construction of facilities of welfare, housing-and-municipal and production appointment at increasing volume of this construction till 2020 up to 60% are provided.

One of the successful directions focusing on the decision of these strategic objectives is the development of construction production of the pre-fabricated constructions using sandwich panels which are at the same time meeting the requirements of environmental friendliness, heat resistance, resistance to sharp overfalls of temperature condition, high level of heat insulation and low water-absorbing properties. Besides, sandwich panels have the affordable price, simplicity of mounting, universality of using and continuous service life. The advantages of application of such constructions in agricultural construction are incontestable. However, resistance of such panels to influence of an external environment depends on characteristics of protecting coverings according to conditions of their maintenance. In this connection, the development of coverings of these panels adapted to operating conditions and conditions of influence of corrosion environment depending on type of agricultural activities is necessary.

In Kazakhstan there is production of wall sandwich panels in Uralsk, Kaskelen, Astana (the plant of the protecting SPAN designs), in Kapshagay (Polimermetall-T company), Aktobe, Atyrau, Almaty, Pavlodar, Kostanay, etc. Therefore industrial interest in creation sandwich panels of agricultural purpose today rather wide within development of already existing productions of construction materials of pre-fabricated buildings and constructions.

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