УДК 691

Otakulov Bakhromjon Adkhamovich.
Candidate of Technical Sciences
Associate Professor of the Department
Production of building materials and structures
Fergana Polytechnic Institute. Uzbekistan
Abdullayev Ulugbek Mahmudovich
Chair assistants
Manufacture of building materials and structures
Fergana Polytechnic Institute. Uzbekistan

HISTORY OF FOAM CONCRETE PRODUCTION DEVELOPMENT

Annotation. The article provides a review of literatures dedicated to the history of the development of foam concrete in industry, building materials and products. The results of work carried out by foreign and domestic researchers on the production and improvement of the technical properties of foam concrete are presented.

Key words: foam concrete, foaming agent, cellular concrete, thermal conductivity coefficient, strength, deformability, frost resistance, thermal insulation, autoclave treatment, non-autoclaved foam concrete**.**

Foam concrete is one of the most demanded materials construction industry all over the world. The use of the material allows you to reduce the coefficient of thermal conductivity, weight of the structure and construction costs. Currently there are more than 260 enterprises in 55 countries annually supplying more than 60 million m³ of construction products from foam concrete.

Foam concrete is a relatively new material; if a brick is 3000 years old, then it is no more than 100. This is an artificial porous stone that can float in water, meeting all the requirements of regulatory documents for building materials, in terms of strength, deformability, frost resistance, its heat-shielding properties are 2-3 times higher than by the brick. Recent years have been characterized by a new surge of interest in aerated concrete. This is due to two reasons: the tightening of

standards in relation to the requirements of thermal protection of building elements and new advances in technology and design of cellular concrete products [1].

At the beginning of the twentieth century, the Swedish architect A. Erickson invented new technologies for the manufacture of artificial stone, with characteristics close to those of wood. This event marked the beginning of the development of the history of aerated concrete. This invention was protected by an international patent in 1924, and after 50-60 years, foam concrete was used in more than forty countries of the world. [2]

Development of technology for the production of cellular concrete of natural

hardening took place at a time when issues related to durability material has not been studied. Influence of temperature and shrinkage deformations on the urability of concrete, as well as the influence of technological factors of production have been insufficiently studied. Large-sized Fencing products made of cellular concrete were characterized by low cracking resistance and were operated without protective coatings at high humidity and exposure to aggressive environments. Under these conditions, the unprotected material quickly collapsed and lost its strength properties.

From the experience of using non-autoclaved aerated concrete products

hardening, it follows that not enough measures were taken during their production to ensure the protection of the material during operation. For guard

products from the effects of aggressive environments, a vapor-proof was used

a dense layer of cement-sand mortar. Due to the accumulation of moisture

on the border of cement-sand mortar and aerated concrete developed destructive processes. The dense protective coating collapsed after the first two years of operation. In some cases, the result of destruction products was insufficient protection of reinforcing steel from corrosion. At the application of measures to eliminate moisture in structures, as well as to protect embedded parts against corrosion, non-autoclaved aerated concrete products hardening acquired the required durability [4].

Further development of the technology for the production of autoclave

aerated concrete by the Ericsson method in Sweden and in other countries went along two directions. One thing led to the production of aerated concrete using the technology YTONG (Sverige). It is autoclaved aerated concrete obtained

from a mixture of quicklime with silica filler, without cement.

The second led to the production of aerated concrete - SIPOREX (Sverige) in 1934, developed by Finnish engineer Lennart Fopsen and Swedish engineer Ivar Eklund, obtained from a mixture of Portland cement and silica component, no quicklime.

In these areas, the production of aerated concrete has been developing since 1935 years in many countries. Aerated concrete plants of YTONG (Sverige) firms, SIPOREX (Sverige), HEBEI (Deutschland), WEHRHAHN (Deutschland), MASA-HENKE (Deutschland) currently operate in many countries of the world. A significant contribution to the production technology was made by SRIPI silicate concrete (Tallinn), Research Institute Concrete and Reinforced Concrete (NIIZHB). In many scientific institutions of the country (Kiev, Rostov-on-Don, Chelyabinsk, etc.) research is underway to find new production methods, improve the properties of the finished material and expanding its areas of application. Similar works are engaged in the departments of engineering and construction institutes in Leningrad, Voronezh, Novosibirsk, Moscow. [5].

The following method of obtaining aerated concrete was proposed Danish engineer E.S. Bayer in 1911, he assumed the preparation concrete mix by mixing an aqueous solution of raw materials with pre-prepared foam. Depending on the type of binder substances and silica filler materials received the following names: foam concrete, foam silicate, foam silicate, foam slag, gypsum foam concrete, etc. [6]

The production of foam concrete by this method began in 1922-1926. v Denmark, then in Germany and other countries. From that time it was a large number of inventions have been patented on methods of obtaining foam concrete from different types of mineral components and with different

foaming agents. Some types of that material are known abroad.
under the names "Isobeton", "Betosel" [7].

The first studies of production technology and properties of lungs concretes in the CIS countries date back to 1930-1935. P.A. Rebinder, B.N. Kaufman and others have developed a technology for the manufacture of heat-insulating foam concrete, gaining design strength in natural conditions. I.T. Kudryashov et al. Have shown the advantages of autoclaved concrete over non-autoclaved ones. Autoclaved concrete has the following advantages: reduced consumption of a binder, reduced shrinkage deformations, increased strength characteristics and reduced time to build design strength. For the first time, large-scale production of autoclaved foam concrete products began in 1939 in Novosibirsk. I.T. In 1940, Kudryashov developed a method for manufacturing products from autoclaved gas silicate using quicklime and finely ground sand. [eight]

Research work in the field of lightweight concrete significantly expanded in the post-war period. Aerated concrete studies were divided into two areas: the use of industrial waste for their production and development of technological parameters for the manufacture of aerated concrete products, including heat treatment modes. So, F.P.Kiviselg and others have done a lot of work in the field of shale ash foam concrete - foam cokermit. P.I. Bozhenov developed the technology of autoclave foam concrete on nepheline cement. From technological research post-war years, it should be noted the work on the search for new pore-formers and technological methods for the production of cellular concrete. These are studies of the "Perhydrol" gas generator E.Ya. Ershler and foaming agent "GK" L.M. Rosenfeld. E.S. Silaenkov carried out work concerning the study of issues of durability of structures made of cellular concrete. Studies of the thermal properties of aerated concrete were carried out K.F. Fokin, B.N. Kaufman. All these and other research papers contributed to the further development of production and use aerated concrete in construction. [9]

Today the construction industry needs new, rational technologies for the production of foam concrete. This is due to the high cost of raw materials and low quality of production products. There are many methods to improve the quality of foam concrete. These include: activation of foam concrete components mixtures, modification of the concrete mixture with additives, vibration impact on the concrete mix, reinforcement with fibrous components, activation of the concrete mix by the action of electrical energy on it.

At the department "Building materials and products and structures" of the Fergana Polytechnic Institute, research is being carried out on the development of new effective foaming agents and the production of foam concrete based on local industrial waste.

REFERENCES

1.Боженов П. И., Сатин М. С. Автоклавный пенобетон. М.-JL, 1960.

2.Абдукаримов Б. А. и др. Способы снижения аэродинамического сопротивления калориферов в системе воздушного отопления ткацких производств и вопросы расчета их тепловых характеристик //Достижения науки и образования. – 2019. – №. 2 (43).

3.Xalimjon o'gli S. J. et al. INFLUENCE ON DURABILITY OF CONTACT ZONE OF WORKING JOINT TIME OF THE ENDURANCE OF A NEW CONCRETE //EPRA International Journal of Environmental Economics, Commerce and Educational Management. – 2021. – Т. 8. – №. 5. – С. 1-2.

4.Adhamovich O. B., Saydi-axmadovich Y. B. EFFECT OF POLYMERY MONOMORES ON THE STRENGTH OF OLD AND CONCRETE CONCRETES.

5.Tulaganov A. et al. FESTIGKEITSBESCHREIBUNG DES SCHWERBETONS AUF ALKALISCHLACKEN–BINDEMITTEL //The Scientific-Practice Journal of Architecture, Construction and Design. – 2021. – Т. 1. – №. 1. – С. 5.

6. Abdukarimov B. A. et al. INCREASING THE EFFICIENCY OF SOLAR AIR HEATERS IN FREE CONVECTION CONDITIONS //Достижения науки и образования. – 2019. – №. 2. – С. 26-27.