



OUTLOOK OF ENERGY AND ECOLOGICAL APPLICATION OF SEWAGE SLUDGE IN CEMENT PRODUCTION

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ABSTRACT

During the following decades, a considerable increase of energy consumption due to economic development and population growth will be expected. This will result in intensified load on power supply system and will require increased attention to energy efficiency. One of possible solutions of intensified power consumption is to save natural resources, to search for alternative resources, to recycle raw materials and to use waste. Along with ferrous and nonferrous metallurgy, fuel processing and chemical industries, production of building materials, including cement, is one of main components of energy balance of industry. Therefore, the technology developed, which utilizes sewage sludge as mineral addition in clinker, will reduce power consumption in cement production.

To calculate natural gas saving, a rotary kiln used in cement production by wet-mix method with efficiency 75 t/h and size 5x185 m is chosen. The result of the calculation of sewage sludge as an additive – inert material showed that due to the exceeding amount of silicon in silt, the additive of sewage sludge is limited up to 6,14%. Saving of natural gas used in the rotary kiln will be about 3,34% (up to 8,7 m³ per 1 ton of cement). Most economically sound method for sewage sludge treatment it is proposed to apply natural freezing that makes it possible to reduce the initial specific resistance of sludge and to improve its dehydrating ability, that, in its turn, will reduce energy costs for drying sludge.

Introduction of technology makes it possible to reduce a risk of further contamination of soil, waters and to better the ecological situation and social-hygienic conditions of population residence near treatment facilities and sewage sludge sites.

The utilization technology makes it possible to lower cement cost due to saving of energy and material resources and to reduce expenditures on sewage sludge storage.

Keywords: sewage sludge, inert additive, cement production, natural freezing, utilization, energy saving