COMPOSITE MATERIALS FOR PROTECTION AGAINST STATIC ELECTRICITY

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Nowadays, static electricity has turned into a disadvantage of a number of industries and brings great losses, often being the cause of explosions and fires [1].

The most effective and affordable means of protection against static electricity is the installation of an electrically conductive floor. Such a material can be electrically conductive concrete (betel-m), which is already used for the production of low-temperature heaters, radio-protective and radiation-protective coatings [2 - 4].

The electrotechnical properties of betel-m are provided by the filler - metal slurry of ShKH-15 steel. Metal slurry has a number of features compared to powders obtained using other technologies. In the process of grinding, the process of metal oxidation takes place, which in practice is called oxidation [5]. Three layers are formed on the surface of steel particles, consisting of iron oxide (FeO), magnetite (Fe_3O_4) and hematite (Fe_2O_3) [6].

In works [6-7], the authors established that the following basic requirements must be taken into account for the use of a conductive filler: the conductive filler must be dispersed and possess the specified parameters of current conductivity; the conductive component should not be subject to corrosion and lead to chemical interaction with the constituent components of the mixture [8].

Also, when using a dispersed conductive filler, it is necessary to take into account the critical values of the volume concentration of the conductive phase. Just as dispersed materials are capable of aggregation during the formation of a mixture. This phenomenon is characteristic of all powder materials and is determined by their surface properties.

The authors found in works [8-9] that the flow of electric current through an unhardened mixture leads to the destruction of aggregates, and therefore makes it possible to obtain an electrically conductive material with stable parameters. The greatest effect of electric current is observed at low concentrations of the conductive phase, at values below the critical limit [9].

Conclusions. To combat static electricity charges, special conductive concrete coatings can be used, their manufacturing technology does not require the use of expensive materials. Waste from bearing enterprises can be used as an electrically conductive component.

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