106. COMPOSITIONS, COATING OR PLASTIC

Cross Reference

Examiner

89

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PROCESS OF MAKING INSULATING MATERIAL

No Drawing. Original application filed May 6, 1926, Serial No. 107,287. Divided and this application filed April 15, 1927. Serial No. 184,175.

This invention relates to a process of making insulating materials, and particularly the making of a composite insulating block having a facing integral with a body portion of high insulating value. It is a division of my co-pending application Serial No. 107,287, filed May 6, 1926.

Insulating blocks made with diatomaceous earth have a high insulating value, but are disadvantageous in that they are rather soft. In the lining of furnace flues and breachings, or for the lining of house heating furnaces, enameling or baking ovens and the like, the ordinary blocks are of little value because of their soft surface character.

In my application above recited, there is described and claimed a composite insulating material comprising a body portion of diatomaceous earth mix having a facing material bonded therewith. Preferably this facing material is a Portland cement mix with a fibrous material incorporated therein. Such facing will withstand acid gases, abrasion, erosion, etc., and because of these characteristics, it permits of an enlarged field of usefulness for the blocks and also aids in materially simplifying the design of many installations. For example, in baking or enameling ovens, the oven wall, instead of being made of two spaced apart metal sheets with insulating blocks therebetween, may be made with a single metal outside wall. In such case, the oven may frequently be built up in panels, thus simplifying repairs and replacements.

I have found that if the composite blocks are made by first laying down the facing mixture, then placing the body mix on top of this and then giving the composite block the treatment usually given to diatomaceous earth mixes in the formation of insulating blocks, the characteristics of the surface material are altered and the desirable properties are enhanced. The liquors from the body mix seem to pass down into the facing mix and change its character somewhat.

The facing material may be laid down in a dry state and the backing mix placed thereover. The liquors which pass down into the facing mix are sufficient to cause it to bond, not only with the backing, but also internally, and thus provide a monolithic facing.

In carrying out my invention I prefer to use a facing material according to the following formula:

	Per cent by weight
Portland cement	50
Screened river sand	46.75
An asbestos such as Canada C grade fibre	3.25

This mixture is made up with water and is placed in the bottom of suitable block molds to any desired depth. In practice, a thickness of about ¼″ will generally be found sufficient for most purposes.

Another facing material which has been found desirable is the following:—

	Per cent by weight
Portland cement	59
Asbestos floats	41

This mixture is found to be somewhat softer than the above formula and is therefore much easier on the saws used in cutting the blocks to size. The term "asbestos floats" is applied to the almost powderlike asbestos which is screened off and also picked up in the exhausters during the process of grading the asbestos.

Another desirable formula for a facing material is as follows:—

	Per cent by weight
Portland cement	82
Diatomaceous earth block trimmings	18

This last mix is economical in practice as the block manufacturer will always have a certain amount of waste material and this can

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readily be incorporated in a facing mix if desired. This last facing mix contains fibre as it is present in the waste material.

Many other facing mixes may be used, or the above formulæ may be varied in accordance with the temperature and hardness requirements for the finished blocks.

On top of the facing mix I place the body mix before the facing material has set. This body mix is preferably according to the following formula:—

	Per cent by weight
Diatomaceous earth	52.6
Hydrated lime	45.2
An asbestos such as African blue fibre	2.2

The above material is mixed with water and is placed on top of the facing mix to a desired depth. The composite block for most purposes will run about two inches thick. The block is subjected to the usual steam induration and after this is completed, it will be found that the surface or facing material is firmly bonded to the body material.

Other body materials may be used. For example, it may be desirable to employ mixtures disclosed in my co-pending application, Serial No. 107,790, filed May 8th, 1926; also in some cases the ordinary diatomaceous earth mix may be employed.

I have found that the characteristics of the facing material are improved by the above described process of forming the blocks. Apparently the liquors from the body material in moving downwardly in the mold, are effective not only for securing a firm bond between the two materials, but also for carrying some of the body material into the facing material and changing its nature somewhat.

I have used the term "block" herein as a term of general definition and not of limitation, and intend thereby to include not only rectangular blocks, but also specially shaped articles, such as pipe covering, still and boiler covers, insulating discs for electrical apparatus, and the like.

I have described a preferred embodiment of the invention, but it will be understood that it is not thus limited, since it may be otherwise practiced within the scope of the following claims:

I claim:—

1. The process of making a composite insulating material comprising forming a cementitious facing mix, applying thereto a body material comprising a diatomaceous earth mix, and treating the composite material to cure the body material.

2. The process of making a composite insulating material comprising forming a cementitious facing, applying thereto a body material comprising a diatomaceous earth mix, and subjecting the composite material to steam induration.

3. The process of making a composite insulating material comprising forming a facing of cementitious material, placing a body material thereover, the body material comprising a diatomaceous earth mix having water therein, and treating the composite material to cure the body material.

4. The process of making a composite insulating material comprising laying down a substantially dry facing mix of cementitious material, placing the body material thereover, the body material comprising a diatomaceous earth mix having water therein, and utilizing the liquors from the body material in the facing mix.

In testimony whereof I have hereunto set my hand.

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