Method for producing an insulating composite building block

The present invention concerns a method for producing a masonry element, or masonry block, in particular a composite insulating building block, and the element or block obtained with said method.

Individual building blocks are widely spread construction elements, the purchase of such material being most economical. However, the thermal insulating properties thereof remain limited. To improve their thermal properties concrete blocks can be made more lightweight by lightening the concrete. In addition, they can be moulded so as to comprise cells or internal voids to benefit from the insulating properties of air. In this case the cells must be of small size e.g. cells of elongate shape having a thickness of no more than 2 cm. Such blocks are difficult to manufacture however and use a large amount of raw material.

Insulating materials have been arranged inside the cells of blocks of lightweight concrete blocks to improve the heat resistance of these building blocks, thereby forming composite insulating blocks. It is known for example to insert mineral wool, glass wool or polystyrene inside breeze blocks of lightweight concrete. However, the manufacturing process is scarcely economical and/or complex. More recently, it has been proposed to fill the cells with cement foams since cement foams has thermal insulating properties of interest.

However, the filling of cavities contained inside blocks of lightweight concrete with cement foams requires quick–setting foam such as calcium aluminate cement foams. If slow–setting foams is used and inserted in foam form, the foam has a tendency to collapse, to become destabilised and to shrink when hardening and to detach from the cavity walls. Evidently, said phenomenon occurs to the detriment of the thermal properties of such composite blocks.

Quick–setting foams, in particular foams of calcium aluminate cement are economically of little interest and are difficult to use in an industrial process due to the very presence of these quick–setting properties (fouling phenomenon).

It is the objective of the invention to overcome these disadvantages by providing a method for producing a composite, insulating mineral block, comprising the following steps:

a) providing a mineral masonry block comprising at least one cell having walls with a water absorption rate of less than 5 g / (m^2.s) at 10 minutes, the block being in the fresh state or sufficiently wet, and

b) filling said cell with a mineral cement foam substantially not containing any calcium aluminate cement.

CLAIMS

1. A method for producing a composite insulating mineral block, comprising the following steps:
   a) providing a mineral masonry block comprising at least one cell with walls having a water absorption rate of less than 5 g / (m^2.s) at 10 minutes, the block being in the fresh state or sufficiently wet, and
   b) filling said cell with a mineral cement foam substantially not comprising any calcium aluminate cement.

2. The method according to claim 1, characterized in that the block used at step a) is already hardened and wetted by adding water to this hardened block.

3. The method according to claim 1 or 2, characterized in that the mineral cement foam does not substantially comprise any quick–setting cement.

4. The method according to one of claims 1 to 3, characterized in that the mineral cement foam has a density of less than 600 kg/m^3.

5. The method according to any one of claims 1 to 4, characterized in that the mineral cement foam used at step b) has thermal conductivity ranging from 0.03 to 0.06 W/m.K.

6. The method according to any one of claims 1 to 5, characterized in that said cell is a through cell.

7. The method according to any one of claims 1 to 6, characterized in that the block is a concrete block.

8. The method according to any one of claims 1 to 7, characterized in that the time lapse between steps a) and b) does not exceed 60 minutes, preferably 30 minutes.

9. The method according to any one of claims 1 to 8, characterized in that it comprises a step for applying a water repellent compound to the cell walls of the block, a preliminary step before filling step b).