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(54) Method for laying a tile floor, as well as a tile floor thus obtained

(57) The invention relates to a method for laying a tile floor in a space, which method comprises the following steps:

i) providing a floor,
ii) providing the sound value of the floor according to step i),
iii) providing tiles,
iv) applying a mathematical model for determining the sound value of a floor i) provided with tiles (iii), using steps i) and iii),
v) comparing the sound value provided in step ii) with the sound value determined in step iv), and
vi) installing the tiles of step iii) on the floor of step i) to obtain the tile floor if the sound value determined in step iv) is higher than or equal to the sound value provided in step ii).

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Description

[0001] The present invention relates to a method for laying a tile floor in a space. The present invention furthermore relates to a tile floor obtained by using such a method as well as to a residential unit or an office, in particular an apartment or a flat, provided with such a tile floor.

[0002] In house construction new trends invariably occur with regard to the way floors are finished. In the early sixties and seventies, floors in residential units were generally carpeted. Because carpets have an inherent sound-damping effect, no further requirements were made of the floor covering. After that period, tile floors became increasingly popular. At present there is a great demand for wooden floors or products derived therefrom, such as wood laminate. Such floors are known to cause noise nuisance. Such noise nuisance is found to be objectionable especially in apartments or flats, where the sound of people walking on the floor may cause a great deal of nuisance. In connection with this, housing corporations or so-called owners' associations impose strict requirements with regard to the sound insulation of such floors so as to minimise the amount of nuisance to the neighbours. In certain situations it is even forbidden to install a stone or wooden floor in an apartment.

[0003] US patent No. 4,681,786 provides a constructional solution to the problem of preventing noise nuisance caused by stone floors by first covering the concrete subfloor with a layer of foam, on which subsequently one or more layers of a flexible plastic foil are laid, on which foil the concrete tiles are subsequently installed by glueing. The foil mainly functions to form a protective layer for the foam layer. The joints between the tiles are filled with a foam material, after which the remaining spaces between the individual tiles and the foam material are filled with an elastomeric adhesive to prevent any direct contact between the concrete tiles. Although such a construction of a tile floor has produced favourable results as regards noise reduction, the installation of such a construction is time-consuming and costly. In addition, the final tile floor will be a few centimetres higher than the original floor, so that the doors in such a space must be shortened, which is undesirable in practice, in particular in rented houses/apartments, which must be put back in their original state when the tenant leaves.

[0004] Another way of reducing the extent of noise nuisance when using tile floors is to adapt the construction of the tile itself, as known from US patent No. 4,742,660. The tile that is known therefrom is provided with hollow spaces which, in addition to a noise-reducing effect, also have a weight-reducing effect. The production of such a tile is complex, however, and there is a fairly great risk of fracture, in particular when upon cutting such a tile to a specific dimension.

[0005] A first aspect of the present invention is to provide a method for laying a tile floor wherein the above drawbacks of the prior art can be avoided.

[0006] Yet another aspect of the present invention is to provide a method for laying a tile floor in a space, wherein the tile floor is laid in such a manner that the noise-reducing value as mentioned in the contractor's specifications is taken into account.

[0007] The method as referred to in the introduction is characterized in that the method comprises the following steps:

i) providing a floor,
ii) providing the sound value of the floor according to step i),
iii) providing tiles,
iv) applying a mathematical model for determining the sound value of a floor i) provided with tiles (iii), using steps i) and iii),
v) comparing the sound value provided in step ii) with the sound value determined in step iv), and
vi) installing the tiles of step iii) on the floor of step i) to obtain the tile floor if the sound value determined in step iv) is higher than or equal to the sound value provided in step ii).

[0008] In step iv) of the present method, the sound value that a floor provided with such tiles will have is determined via a mathematical model, starting from the floor, in particular from a detail of the construction of said floor, and the associated tiles. Suitable measuring methods include NEN ISO 140-8 "De meting voor verbetering conctactgeluidisolatie" (*measurement for improving impact sound insulation*) or the measurement entitled "Isolatiemeting ten behoeve van contactgeluidindex (I_{co}) van de scheidingsconstructie van de woningen onderling" (*insulation measurement for determining an impact sound index of the separation construction between houses*). A suitable floor according to step i) is a poured floor, viz. anhydrite. If the sound value thus obtained remains within the aforesaid bounds, the tiles can be installed on the floor without this leading to a sound value which does not comply with the specifications or which is unacceptable to the user. It should be understood that the maximum allowable sound value is generally determined by the housing corporation or the owners' association. This rules out the risk of the tile floor not complying with the maximum allowable sound value once it has been laid, which might result in the enforced removal of the floor.

[0009] In step vi), an adhesive is preferably used for installing the tiles of step iii) on the floor of step i), and the application of the adhesive is carried out in such a manner that substantially the entire contact surface between the tile according to step iii) and the floor according to step i) is provided with the adhesive.

[0010] In this way a tile floor is obtained in which a considerable layer of adhesive is present between the floor and the tile so as to prevent any direct sound-trans-

mitting contact between the tile and the floor.

[0011] To effect a proper adhesion of the adhesive, the residual moisture content of the floor must not exceed 1.0%, measured in accordance with the calcium carbide method, before the adhesive is applied. To obtain a very good adhesion of the adhesive, the residual moisture content of the floor must not exceed 0.5%, measured in accordance with the calcium carbide method. Other measuring methods are available, such as the G.A.N.N. method, wherein the residual moisture content is determined by means of an electronic indication meter, which value must not exceed 1.0%, in particular 0.5%.

[0012] Since the adhesive is directly applied to the floor, in certain embodiments step vi) preferably comprises a further step vii), which comprises the scouring of the floor of step i) before the installation of the tiles of step iii) takes place.

[0013] To obtain a good sound-insulating effect, it is moreover desirable to install the tiles of step iii) on the floor of step i) in such a manner that any contact thereof with walls, radiator pipes, thresholds and/or girders is avoided. It stands to reason that the term walls is understood to include other vertical elements present in the space, such as any staircases, kitchen units, doors, built-in cabinets and the like.

[0014] To prevent the transmission of impact sound it is preferable to fill all the joints that may form a bridge, in which connection it is desirable to use a flexible jointing material for filling the joints between the tiles of step iii).

[0015] In addition it is desirable to provide the circumferential joints of the tile floor with a joint filling compound.

[0016] Skirting tiles, if present, are preferably glued to the wall, in such a manner that as to be clear of the floor, after which the open joint must be filled with a filling compound yet.

[0017] The invention further relates to a tile floor obtained by using the present method, said floor in particular being installed in an apartment or flat, of which residential units special requirements are made as regards the sound insulation thereof.

Claims

1. A method for laying a tile floor in a space, **characterized in that** the method comprises the following steps:

   i) providing a floor,
   ii) providing the sound value of the floor according to step i),
   iii) providing tiles,
   iv) applying a mathematical model for determining the sound value of a floor i) provided with tiles (iii), using steps i) and iii),
   v) comparing the sound value provided in step ii) with the sound value determined in step iv), and
   vi) installing the tiles of step iii) on the floor of step i) to obtain the tile floor if the sound value determined in step iv) is higher than or equal to the sound value provided in step ii).

2. A method according to claim 1, **characterized in that** an adhesive is used for installing the tiles of step iii) on the floor of step i).

3. A method according to claim 2, **characterized in that** the residual moisture content of the floor must not exceed 1.0%, measured in accordance with the calcium carbide method, before the adhesive is applied.

4. A method according to claim 3, **characterized in that** the residual moisture content of the floor must not exceed 0.5%, measured in accordance with the calcium carbide method, before the adhesive is applied.

5. A method according to any one or more of the claims 2-4, **characterized in that** the application of the adhesive is carried out in such a manner that substantially the entire contact surface between the tile of step iii) and the floor of step i) is provided with the adhesive.

6. A method according to any one or more of the preceding claims 1-5, **characterized in that** step vi) comprises a further step vii), which comprises the scouring of the floor of step i) before the installation of the tiles of step iii) takes place.

7. A method according to any one or more of the preceding claims 1-6, **characterized in that** the tiles of step iii) are installed on the floor of step i) in such a manner that any contact thereof with walls, radiator pipes, thresholds and/or girders is avoided.

8. A method according to any one or more of the preceding claims 1-7, **characterized in that** the joints between the tiles of step iii) are filled with a flexible jointing material.

9. A method according to any one or more of the preceding claims 1-8, **characterized in that** the circumferential joints of the tile floor are provided with a joint filling compound.

10. A method according to any one or more of the preceding claims 1-9, **characterized in that** the installation of skirting tiles is carried out in such a manner that said tiles are clear of the floor.

11. A method according to claim 10, **characterized in that** the skirting tiles are glued to the walls, with the joints thus formed being filled with a filling compound.

12. A tile floor obtained by using the method according to any one or more of the preceding claims 1-11.

13. An apartment provided with a tile floor according to claim 12.

14. A flat provided with a tile floor according to claim 12.

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EUROPEAN SEARCH REPORT

Application Number
EP 04 07 7430

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	8 November 2004	Hendrickx, X

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 07 7430

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82