

(54) POLYVINYLCHLORIDE COMPOSITION FOR LINOLEUM

(57) Abstract:

FIELD: polymer materials.

SUBSTANCE: invention relates to filled polyvinyl chloride composition intended for use in manufacture of linoleum having utilization as floor toppings in industrial and civil construction. Composition contains suspended polyvinyl chloride, dioctyl phthalate, calcium stearate, and filler in the form of swollen sand, namely exhausted insulating filling from cryogenic plants.

EFFECT: improved performance characteristics and reduced cost due to utilized waste.

RU2299223. Claim

The polyvinyl chloride composition for the linoleum, which includes slurry polyvinyl chloride, dioctyl phthalate, calcium stearate and filler, that is characterized by the fact that contains as the filler the swollen pearlitic sand in the form of the waste thermal filling of cryogenic installations with the following ratio of components, parts by mass.

Polyvinyl chloride slurry 100

dioctyl phthalate 40-50

calcium stearate 2

swollen pearlitic sand 55-75

RU2299223. Description

Invention relates to the filled plasticized PVC- compositions, intended for the utilization in the production of the linoleum, used as coating of floors in the industrial and civil/civilian building. Is known the polymeric composition for the linoleum, in which as the traditional filler is used asbestos (author's of svid. USSR ¹ 973568 " polymeric composition for the linoleum"). This composition is

characterized by the increased indices of abrasability. Are known to composition on the basis of polyvinyl chloride, filled with the inorganic components, which are characterized by porous structure, including withdrawals/departures, in particular phosphogypsum, lime flour (Normetov L.T., Aripov 3.A. Influence of fillers on the physicomachanical properties of PVC- linoleum / / plastics, 1989, ¹ 4, s. 55 - 56). Composition contains to 100 parts by mass. PVC to 70 parts by mass. of filler, namely lime dust, argillaceous clay or phosphogypsum. As the plasticizer is used the mixture of dioctyl phthalate and chlorinated polyethylene in a quantity of 45 parts by mass. to 100 mas. PVC drawbacks in the composition is that that the utilized fillers require preliminary ground product in the ball mill to the sizes of 50-60 μm , furthermore, they are characterized by the apparent (bulk) density from 460 to 700 kg/m^3 , that cannot ensure reduction in the density of linoleum (i.e., reduction in the weight of articles) and they are characterized by high abrasability. The polymeric composition for the linoleum, which for the purpose of an improvement in the physicomachanical properties and utilization of withdrawals/departures as the filler contains phospho slag (author's of svid, is the closest analog. USSR ¹ 1707029 " polymeric composition for the linoleum"). The utilization of phospho slag requires the additional ground product of filler, and it is also characterized by the increased values of absolute residual strain with the depression and the abrasability. The problem of invention is search for the PVC- composition of fillers from the number of production wastes without the preliminary preparation (additional ground product) for the reduction of prices of materials without worsening/deterioration in their basic consumer properties, and also reduction in the weight of articles and improvement in the physicomachanical indices. Result is reached by the fact that in the PVC- composition for the linoleum, which includes PVC, dioctyl phthalate, calcium stearate and filler, according to invention is contained as the filler the swollen pearlitic sand in the form of the waste thermal filling of cryogenic installations with the following relationship/ratio of ingredients (parts by mass.):

PVC slurry 100
dioctyl phthalate 40-50
calcium stearate 2
swollen pearlitic sand 55-75

Composition for the PVC- linoleum includes the following components:
PVC slurry according to GOST 14332-78, dioctyl phthalate according to GOST 8778-77, calcium stearate on TU 6-09-4104-87. As the filler is used the swollen pearlitic sand in the form of the waste thermal filling of cryogenic installations. The swollen pearlitic sand consists, in essence, of porous aluminosilicate glass and is characterized by the porous structure. The bulk density of the swollen pearlitic sand of approximately 35-50 kg/m³, coefficient of heat conductivity 0,04-0,045 W/(m·K). Specific surface area composes 31000 sm² / deg, the predominant size of particles 10-70 µm for preparing the samples was used the swollen pearlitic sand in the form of the waste thermal filling of cryogenic installations OAO " By Nizhnekamskneftekhim ". The chemical composition: SiO₂ - 74,93%; TiO₂ - 0,08%; Al₂O₃ - 12,38%; Fe₂O₃ - 0,55%; FeO - 0,36%; CaO - 0,91%; MnO - 0,09%; MgO - 0,17%; Na₂O - 3,29%; K₂O - 4,64%; P₂O₅ - 0,02%; SO₃ - 0,05%. For the analyses of PVC- compositions the samples in the form of films and plates were prepared. Composition is prepared as follows. Preliminarily is prepared the mixture of dioctyl phthalate and swollen pearlitic sand with the mechanical agitation in the course of 1-3 minutes. Then slurry PVC and calcium stearate they mix during 1-1,5 minutes with the prepared plasticizer blend and filler at room temperature, thermostatically control during 20 minutes at a temperature 80°C. film samples they are prepared with the method of thermal plastification on the laboratory rolls with friction 1:1,25 at a temperature of shafts 140 - 150 °C during 5-6 minutes. Milling is conducted with the thickness of roll gap 8-13 µm the extrusion/pressing samples in the form of the plates with a thickness of 3 mm it is achieved on the hydraulic press at a temperature 160 - 170 °C under the pressure 3-5 MPa during 3 minutes. Tests were conducted according to GOST - 18108-80 and GOST - 11529-86. Sample density was evaluated by the method of volume determination by

Archimedes principle in the distilled water at a temperature 22°C, and hardness on the instrument TSHM-2. composition and properties of composition were represented into table 1 and 2.

Table 1

Composition of PVC- compositions (parts by mass.)

Components of the composition 123

PVC 100 100 100

DOPA 45 45 45

calcium stearate 2 2 2

swollen pearlitic sand 55 60 75

Table 2

Properties of the PVC- composition

Indices 123 **Prototype (100 parts by mass. PVC + 73 parts by mass. of phospho slag)**

hardness, kg/mm² 0,37 0,42 0,45 0,27

abradability, μm 32 37 42 54

density, kg/me 1470 1465 1435 1485

absolute residual strain, mm 0,21 0,22 0,30 0,40

Given to Tabl.2 data show that the introduction into the composition of the composition of porous mineral filler in the limits of 55-75 parts by mass. raises hardness, are reduced residual strain, abradability and density. Thus, the utilization of the composition proposed makes it possible to obtain composition for the linoleum with the improved performance properties, in this case is utilized the waste insulator and is reduced the price production.