a) a powdery organic binder including a polymer obtained by spray-drying or lyophilisation of a dispersion containing said polymer and a protective colloid;

b) a deprotection agentchosen among those which are effective without increasing the pH of the dispersion obtained by mixing said composition with water, to a value greater than or equal to 10 and preferably greater than or equal to 9; so that the water-resistance of a finish obtained from a slurry made by mixing of the dry composition with water to the correct consistency, with respect to the whole mix water/dry composition, said water-resistance of the finish being measured according to the test ASTM D2486-06, is greater than, in an increased order of preference, 3000; 4000 ; 5000 ; 6000 ; 10 000 cycles;

c) a specific adsorbent filler;

d) ~~and/or~~optionally a load;

e) optionally~~and/or~~ water retentive agent;

f) optionally~~and/or~~ a rheological agent;

g) optionally~~and/or~~ a defoamer;

h) optionally~~and/or~~ a biocide;

i) optionally~~and/or~~ a pigment;

j) optionally~~and/or~~ fibers;

k) optionally~~and/or~~ a mineral binder;

l) optionally~~and/or~~ a flame retardant (or flame proof agent).

In a remarkable variant, the redispersible dry composition according to the invention, is characterized by a dry % mass ratio *specific filler c) *100 / polymer a)* that is greater or equal to, in an increasing preference order, 10, 20, 30, preferably greater or equal to 50, more preferably greater or equal to150,
and lower or equal to, in a decreasing preference order, 1200, 1000, 950, preferably lower or equal to 910, more preferably lower or equal to 850.

~~In an other remarkable variant, the redispersible dry composition according to the invention, is characterized by the water-resistance of a coating obtained from a slurry made by mixing of the dry composition with water to the correct consistency with respect to the whole mix water/dry composition, said water-resistance of the coating being measured according to the test ASTM D2486-06, is greater than, in an increased order of preference, 3000 ; 4000 ; 5000 ; 6000 ; 10000 cycles.~~

The thickness of the coating in the above mentioned test could vary from the one of ASTM D2486-06 norm. The thickness could increase if the granulometry of the largest load is

greater to the 180 microns requested in the ASTM D2486-06. The thickness of the coating should then correspond to the maximum diameter of the largest load.

The « correct consistency » could be for instance determined by comparison with the following products:

- floor grout 5046 Elit from Parexlanko, mixed with water to a 27% (+/- 1%) water mix ratio (for floor joint fillers);
- DPR Sandfine from the Parex company (for acrylic renders)
- 451 Lankotoit from the Parexlanko company (for roof waterproofing membranes)

In a particular embodiment, the redispersible dry composition of polymer finish according to the invention, comprise:

a) a powdery organic binder included a polymer obtained by spray-drying or lyophilisation of a dispersion containing said polymer and a protective colloid;
b) a deprotection agent;
c) a specific adsorbent filler;
d) a load;
e) a water retentive agent;
f) optionally~~and/or~~ a rheological agent;
g) optionally~~and/or~~ a defoamer;
h) optionally~~and/or~~ a biocide;
i) optionally~~and/or~~ a pigment.

This composition fulfils at least one of the above mentioned objects.

It is to the credit of the inventors to have designed a redispersible powder dry composition of plaster, mortar, rendering or finish, which is to address to the problem of redispersion in water of polymer-binded coatings or mass objects which are normally only water-resistant when resulting from alkaline aqueous slurries whose pH are greater than 10, especially greater than or equal to 11, and preferably to 12. Now, pH>12 are synonymous of formation of a powdery deposit on the surface of bodies, masonry units, etc., following a loss of water in open air (efflorescence).

In particular, the inventors succeeded in obtaining a dry composition which can be easily and rapidly transformed into a wet formulation, a slurry, the pH of which is below 10, preferably below 9, by mixing with a liquid, e.g. water.

It is then possible to get a coating or a mass object from this slurry. Said coating is advantageously water-resistant and not subject to efflorescence.

Water-resistance is a very interesting property of the coatings or of the mass objects which are the results of pH<10 slurries obtained from mixes of water and dry compositions according to the invention. The water-resistance can be notably given by the wet scrub test and the drip test hereinafter defined.

This result has been obtained notably by incorporating into the dry composition, at least a deprotection agent b) and at least a specific adsorbent filler c).

Such a dry powder composition makes it also possible to overcome the drawbacks of water in the known wet polymer finish formulations, namely strength to thermal shocks, biological instability and cost of transport.

- The granulometry of a "*granulate*" is greater than 1 mm, preferably less or equal to 10 mm.
- "*Filler*" designates a fine and/or light mineral powdery loading material incorporated in the mortars, plasters, renderings or finishes, and the D_{50} of which is lower than 100 µm.
- "*Load*" designates a mineral powdery loading material incorporated in the mortars, plasters, renderings or finishes, and the D_{50} of which is greater than 100 µm.
- "*Acrylic*" refers to homopolymers or copolymers formed of monomers selected from the group of acrylate esters.

Detailed description of the invention

In a preferred embodiment, the powder dry composition according to the invention is cement-free and/or lime-free.

Powdery organic binder a):

The polymer of the binder a) is preferably chosen from the group comprising, preferably consisting of: acrylic, acrylic/acrylic, styrene/acrylic, styrene/butadiene, vinyl-acetate/ethylene, vinyl-acetate/versatate and vinyl-acetate/versatate/ethylene polymer; the acrylic, acrylic/acrylic, styrene/acrylic polymer being preferred.

In a variant, the binder a) can comprise a combination of different polymers.

The protective colloid of the binder a) is, for instance a polyvinyl alcohol, or a low molecular weight surface active compound, or taken from the group of salts of arylsulfonic acid formaldehyde condensates (U.S. Pat. No. 5,225,478).

Deprotection agent b)

Advantageously, the deprotection agent b) is chosen among those which are effective without increasing the pH of the dispersion obtained by mixing said composition with water, to a value ~~less~~ greater than or equal to10 and preferably greater than or equal to 9.

Regarding the quantitative aspect of the composition according to the invention, it is preferable that the dry % mass ratio *deprotection agent b)*100 / polymer a)* be greater or equal to, in an increasing preference order, 1, 8, 10, 15, 20, 30, preferably comprised between 15 and 25.

Actually, the deprotection agent b) is e.g. chosen in the group of products comprising, preferably consisting of glycol ethers, sodium triphosphate, the glycol ethers being more preferably chosen in the group of products comprising, preferably consisting of ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, Ethylene glycol monopropyl

EXAMPLES

-I- Raw materials

a) powdery organic binder:

(a.1) redispersible powder acrylic polymer commercialized by ELOTEX under the name WR8600

(a.2) redispersible powder styrene/acrylic polymer commercialized by BASF under the name ACRONAL® S695P

(a.3) redispersible powder acrylic polymer commercialized by WACKER® under the name Vinnapas®1540 N

(a.4) redispersible powder Vinylacetate / Ethylene polymer commercialized by WACKER® under the name Vinnapas®5010 N

b) Deprotection agent:

~~Triethylene glycol monobutyl ether:~~ Metolat® 872P commercialized by Münzig ~~under the name Metolat® 872P.~~ : Blend of aliphatic alcohols and glycols (notably triethylene glycol monobutyl ether) with an inorganic carrier: content of triethylene glycol monobutyl ether in the powder : 25 to 50%.

c) Specific adsorbent filler:

(c.1) calcareous filler commercialized by Omya® under the name Beatite® 30

(c.2) calcareous filler commercialized by Omya® under the name Hydrocarb® -OG

d) a load:

(d.1) calcareous sand commercialized by la provençale® under the name Calgar®

(d.2) siliceous sand commercialized by Sibelco France under the name N14

(d.3) calcareous sand commercialized by Omya® under the name Durcal® 130

e) a water-retentive agent:

cellulosic ether: commercialized by Dow® chemicals under the name Methocel®

CLAIMS

1. Redispersible dry composition of polymer finish comprising:

a) a powdery organic binder included a polymer obtained by spray-drying or lyophilisation of a dispersion containing said polymer and a protective colloid;

b) a deprotection agent chosen among those which are effective without increasing the pH of the dispersion obtained by mixing said composition with water, to a value greater than or equal to 10 and preferably greater than or equal to 9; so that the water-resistance of a finish obtained from a slurry made by mixing of the dry composition with water to the correct consistency, with respect to the whole mix water/dry composition, said water-resistance of the finish being measured according to the test ASTM D2486-06, is greater than, in an increased order of preference, 3000; 4000 ; 5000 ; 6000 ; 10 000 cycles;

c) a specific adsorbent filler whose oil absorption (OA), according to ISO 787/5 and in g / 100 g, is greater than or equal to, in an increased order of preference: 1; 5; 10; 20;

d) ~~and/or~~optionally a load;

e) optionally~~and/or~~ water retentive agent;

f) optionally~~and/or~~ a rheological agent;

g) optionally~~and/or~~ a defoamer;

h) optionally~~and/or~~ a biocide;

i) optionally~~and/or~~ a pigment;~~.~~

j) optionally~~and/or~~ fibers;

k) optionally~~and/or~~ a mineral binder; and

l) optionally~~and/or~~ a flame retardant (or flame proof agent).~~;~~

2. Redispersible dry composition according to claim 1wherein the dry % mass ratio *specific filler c) *100 / polymer a)* that is greater or equal to, in an increasing preference order, 10, 20, 30, preferably greater or equal to 50, more preferably greater or equal to150, and lower or equal to, in a decreasing preference order, 1200, 1000, 950, preferably lower or equal to 910, more preferably lower or equal to 850.

~~3. Redispersible dry composition according to claim 1, wherein the water-resistance of a finish obtained from a slurry made by mixing of the dry composition~~

~~with water to the correct consistency, with respect to the whole mix water/dry composition, said water-resistance of the finish being measured according to the test ASTM D2486-06, is greater than, in an increased order of preference, 3000; 4000 ; 5000 ; 6000 ; 10 000 cycles~~.

4.3. Redispersible dry composition of polymer finish according to claim 1 comprising:

a) a powdery organic binder included a polymer obtained by spray-drying or lyophilisation of a dispersion containing said polymer and a protective colloid;

b) a deprotection agent;

c) a specific adsorbent filler;

d) a load;
e) a water retentive agent;
f) ~~and/or~~optionally a rheological agent;
g) optionally~~and/or~~ a defoamer;
h) optionally~~and/or~~ a biocide;
i) optionally~~and/or~~ a pigment.

~~5.~~4. A composition according to claim 1 which is cement-free and/or lime-free.

~~6.~~5. A composition according to claim 1 or 2, wherein the binder a) is a homopolymer or copolymer chosen from the group comprising, preferably consisting of: acrylics, styrene/acrylic, styrene/butadiene, vinyl-acetate/ethylene, vinyl-acetate/versatate and vinyl-acetate/versatate/ethylene polymer, acrylic /acrylic copolymer being preferred.

~~7. A composition according to any of the preceding claims, wherein the deprotection agent b) is chosen among those which are effective without increasing the pH of the dispersion obtained by mixing said composition with water, to a value less or equal to 10 and preferably to 9.~~

~~8.~~6. A composition according to claim 41, wherein the deprotection agent b) is chosen in the group of products ~~comprising, preferably~~ consisting of glycol ethers, sodium triphosphate; the glycol ethers being more preferably in the group consisting of ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, Ethylene glycol monopropyl ether, ethylene glycol monoisopropyl ether, (2-isopropoxy)ethanol, ethylene glycol monobutyl ether , ethylene glycol monophenyl ether, ethylene glycol monobenzyl ether, diethylene glycol monomethyl ether 2-(2-methoxyethoxy)ethanol, glycol ether with the following physical characteristics:

Molecular weight (g/mol)		120.1
Boiling point @ 760 mmHg, 1.01 bar	381°F	194°C
Flash point	205°F	96°C
Freezing point	-92°F	-69°C
Vapor pressure @ 20°C — extrapolated		0.19 mmHg 0.25 mbar
Specific gravity (25/25°C)		1.020
Density @ 20°C @ 25°C	8.53 lb/gal 8.49 lb/gal	1.022 g/cm³ 1.017 g/cm³
Viscosity (cP or mPa•s @ 25°C)		3.5
Surface tension (dynes/cm @ 25°C)		24.6
Specific heat (J/g/°C @ 25°C)	-	2.30
Heat of vaporization (J/g) at normal boiling point		369
Net heat of combustion (kJ/g) — predicted @ 25°C		23.6
Autoignition temperature	464°F	240°C
Evaporation rate	(n-butyl acetate = 1.0) (diethyl ether = 1.0)	0.019 628
Solubility, g/100 g @ 25°C Solvent in water Water in solvent	-	- -
Hansen solubility parameters (J/cm³)[1/2] d (Dispersion) p (Polar) h (Hydrogen bonding)		16.2 7.8 12.6
Flammable limits (vol.% in air) Lower Upper	-	1.38 22.70

~~methyl carbitol,~~ diethylene glycol monoethyl ether 2-(2-ethoxyethoxy)ethanol, ~~carbitol cellosolve,~~ diethylene glycol mono-n-butyl ether, ethylene glycol dimethyl ether, ethylene glycol diethyl ether, ethylene glycol dibutyl ether, Ethylene glycol methyl ether acetate, ethylene glycol monethylether acetate, ethylene glycol monobutyl ether acetate tripropylene glycol n-butyl ether, dipropylene glycol n-butyl ether, triethylene glycol monobutyl etherpropylene glycol.

~~9.~~7. A composition according to any of the preceding claims, wherein the specific adsorbent filler c) ~~has an oil absorption (OA) according to ISO 787/5 and in g / 100~~

~~g: OA greater than or equal to, in an increased order of preference: 1; 5; 10; 20 ; said specific adsorbent being preferably~~ is selected in the aluminosilicates, calcareous or marble fillers~~, and, more preferably in the group consisting of the commercial~~

~~products beatite® Omya®; Omyacarb®; Mikhart®; Titan®; Calciteeh®~~ and mixes thereof.

~~10.~~8. A composition according to any of the preceding claims, wherein the dry % mass ratio *deprotection agent b)*100 /polymer a)* is greater or equal to, in an increasing preference order, 1, 8, 10, 15, 20, 30, preferably comprised between 15 and 25.

~~11.~~9. A composition according to any of the preceding claims, wherein the load d) is chosen from the group of calcareous and/or siliceous sands and/or vermiculite and/or perlite.

~~12.~~10. A wet formulation obtained by mixing water with the redispersible dry composition of polymer finish according to any of the preceding claims, said formulation ~~being preferably plasters, renderings, finishes or mortars~~ having a pH below 10, preferably below 9.

~~13.~~11. Application of the wet formulation according to claim ~~12~~10, onto the surface of buildings or civil engineering works to produce coatings.

~~14.~~12. Buildings or civil engineering works or coatings applied thereon or finishes, obtained from the wet formulation according to claim 10~~2~~.

~~15.~~13. Finishes obtained from the wet formulation according to claim 10~~2~~, the water resistance of said finish being measured according to the test ASTM D2486-06, being greater than, in an increased order of preference, 3000 ; 4000 ; 5000 ; 6000 ; 10 000 cycles; said finish being obtained from a slurry made by mixing of the dry composition with water to the correct consistency with respect to the whole mixed water / dry composition.