

## Title (en)

FUNCTIONALIZED POLYURETHANE RESIN, METHOD FOR THE PRODUCTION THEREOF, AND USE THEREOF

## Title (de)

FUNKTIONALISIERTES POLYURETHANHARZ, VERFAHREN ZU SEINER HERSTELLUNG SOWIE DESSEN VERWENDUNG

## Title (fr)

RÉSINE DE POLYURÉTHANNE FONCTIONNALISÉE, SON PROCÉDÉ DE PRODUCTION ET SON UTILISATION

## Publication

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## Application

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## Priority

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## Abstract (en)

[origin: DE102006046368A1] New functionalized polyurethane resins comprise: a binder component (I), consisting of a fluoro-modified, anionic, nonionic and/or cation stabilized oligo- or polyurethane dispersions or solutions, based on specific fluorinated reaction products; optionally hardener component(s) (II), consisting of a polyisocyanate (or derivative or homolog) with reactive isocyanate groups or a carbodiimide crosslinker; and optionally formulation component(s) (III). New functionalized polyurethane resins comprise (all parts and percentages by weight): 100.0-100.1 parts of a binder component (I), consisting of a fluoro-modified, anionic, nonionic and/or cation stabilized oligo- or polyurethane dispersion or solution with polymer-bonded F-content 0.01-10%, molecular weight 10000-1000000 and 0-25% free amino groups and/or 0-25% free hydroxy groups; 0-50 parts hardener component(s) (II) of molecular weight (MW) 100-5000, consisting of a polyisocyanate (or derivative or homolog) with two or more reactive isocyanate (NCO) groups or a carbodiimide crosslinker; and 0-300.0 parts formulation component (III). The structural components of the binder (I) are: (i) 0.3-7.5 parts fluoro-modified polymeric hydrophobizing and oleophobicizing component (A) of MW 250-25000, with polymer-bonded F-content 0.5-90%, 2 or more amino, hydroxy (OH) and/or mercapto (SH) groups or 2 or more NCO groups; (ii) 0.1-2.5 parts polyol(s) (B1) of MW 62-499; (iii) 0-2.5 parts hydrophobic modified polyol(s) (B2) of MW 118-750, containing octamethylene or higher polymethylene elements in the main- and/or side-chain; (iv) 0-2.5 parts anionic and/or cationic modifiable polyol(s) (B3) of MW 104-499, with carboxylic, phosphonic and/or sulfonic acid group(s) (salified or salifiable with base) or tert. amino group(s) (salified or salifiable with acid); (v) 0.1-2.5 parts nonionic hydrophilic polymeric polyol(s) (B4) of MW 500-5000; (vi) 1.0-25.0 parts high-molecular polyol(s) of MW 500-10000; (vii) 1.0-25.0 parts polyisocyanate component(s) (C) of MW 100-5000, consisting of a polyisocyanate (or derivative or homolog) with reactive NCO groups; (viii) 0.1-2.5 parts (in)organic base and/or acid as neutralization component(s) (D); (ix) 0.1-2.5 parts chain extending and/or terminating component(s) (E) of MW 60-5000, with prim. and/or sec. amino group(s) and/or OH group(s); (x) 0-2.5 parts reactive nanoparticle(s) (F), consisting of (in)organic nanoparticles or nanocomposites in the form of primary particles, aggregates and/or agglomerates, optionally hydrophobized, doped and/or coated and surface modified with reactive amino, OH, SH, NCO, epoxy, methacryloyl and/or silane groups; (xi) 0-100 parts high- and/or low-boiling organic solvent(s) (G); (xii) 0-0.1 parts catalyst(s) (H); and (xiii) 97.3-100.0 parts water. The fluoro-modified component (A) (i.e. (i)) is selected from 35 specific general classes of materials, e.g. reaction products (RP1) with 2 or more OH groups, obtained from: (1) 5-95% of: (per)fluoroalkanol components (A1), consisting of perfluoroalkanols with terminal methylene groups (hydrocarbon spacers) of formula CF<sub>3</sub>(CF<sub>2</sub>)<sub>y</sub>OA xH (A1A) and/or CR<sub>3</sub>(CF<sub>2</sub>)<sub>y</sub>OA xH (A1B) and/or hexafluoropropylene oligomer alcohols of formula CF<sub>3</sub>CF<sub>2</sub>CF<sub>2</sub>-(OCF(CF<sub>3</sub>)CF<sub>2</sub>)<sub>x</sub>-OCF(CF<sub>3</sub>)CH<sub>2</sub>OA xH (A1C); (per)fluoroalkyl alkyleneamine components (A2); and/or fluoro-modified macromonomeric or telechelic components (A3) of MW 100-10000, containing 1-99% polymer-bonded F and having (in the main and/or side-chains) intra-chain, lateral and/or terminal elements of formula (CF<sub>2</sub>CF<sub>2</sub>)<sub>x</sub>, (CR<sub>2</sub>CF<sub>2</sub>)<sub>x</sub>, (CF<sub>2</sub>CF<sub>2</sub>(CF<sub>3</sub>)O)<sub>x</sub> and/or (CF<sub>2</sub>CF<sub>2</sub>)<sub>x</sub>, plus reactive (cyclo)aliphatic and/or aromatic OH, prim. and/or sec. amino and/or SH group(s); (2) 75-5% difunctional polyisocyanate component (C 1) with 2 or more NCO groups; and (3) 75-5% of: aminoalcohol components (A 4) with one prim. or sec. amino group and OH group(s); and/or mercaptoalcohol components (A5) with one SH group and OH group(s). R : H, F or CF<sub>3</sub>; x : 3-20; y : 1-6; z : 0-100; A : C(R i) 2C(R i) 2O, (C(R i) 2) aO or CO(C(R i) 2) bO (the A x units being homopolymers, copolymers or block copolymers of alkylene oxides, polyoxyalkylene glycols or polylactones); each R iH, alkyl, cycloalkyl, aryl or any 1-25C organic group; a, b : 3-5. The reaction is preferably carried out molar ratio 1:1:1 in the case of diisocyanates, and the product (RP1) consist of deprotonated perfluorinated component bonded via deprotonated isocyanate component to deprotonated aminoalcohol or aminomercaptan component. Independent claims are included for: (1) the preparation of the new resins; and (2) the use of the resins for producing fluoro-modified polyurethane coatings, by preparing the binder (I), optionally reacting with the hardener (II) and applying the product to a substrate, the particulate component (F) and/or the formulation component optionally being added at any stage.

## IPC 8 full level

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