

Claims

1. A particulate polyurea compound a2) for reducing gloss of coatings, wherein:
 - the volume percentage of particles of the particulate polyurea compound a2) having a diameter of smaller than 10 μm is equal or less than 40%, preferably less than 30%, more preferably less than 25%, and the volume percentage of particles of the polyurea product having a diameter larger than 20 μm is equal or more than 11%, preferably more than 15%, more preferably more than 25%, and most preferably more than 40%,
 - the average particle size of the polyurea compound a2) is from 11 to 80 μm , and
 - the polyurea compound a2) comprises an average number of urea bonds of at least two and at most six urea bonds per molecule.
2. The particulate polyurea compound a2) according to claim 1, wherein the relative particle size distribution width, which is the ratio between the particle size at 90 vol% of the particle size distribution and the particle size at 10 vol% of the particle size distribution, is between 1 and 10, preferably between 2 and 8, more preferably between 2 and 6.
3. The particulate polyurea compound a2) according to claim 1 or 2, wherein the average particle size of the polyurea compound a2) is from 15 to 80 μm , preferably between 15 and 60 μm , more preferably between 19 and 41 μm .
4. The particulate polyurea compound a2) according to any of the preceding claims, wherein the polyurea compound a2) is formed from the reaction of a polyisocyanate or its isocyanurate, biuret, or uretdione derivative, or other derivatives of polyisocyanate, with at least one amine, which is preferably a mono-amine.
5. The particulate polyurea compound a2) according to claim 4, wherein
 - the polyisocyanate is selected from the group consisting of hexamethylene-1,6-diisocyanate (HMDI), its isocyanurate trimer or biuret, trans-cyclohexylene-1,4-diisocyanate, para- and meta-xylylene diisocyanate, toluene diisocyanate, and mixtures thereof; and/or
 - the amine is a mono-amine and is a primary amine, preferably an n-aliphatic amine, more preferably an n-alkylamine such as hexylamine, cyclohexylamine, benzylamine, 3-methoxypropylamine, S-alpha-methylbenzylamine, 2-phenethylamine, or mixtures thereof.

6. The particulate polyurea compound a2) according to any of the preceding claims, wherein the average number of urea bonds in the polyurea compound a2) is at least 2 and at most 4.5 per molecule, preferably at least 2 and at most 4, more preferably at least 2 and at most 3.9, and most preferably at least 3 and at most 3.9.
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7. A resin composition A comprising
- a film forming resin a1) comprising
 - at least two functional groups, each functional group having a functionality of at least 1, and/or
 - 10 ○ at least one functional group having a functionality of at least 2;
 - a particulate polyurea compound a2) according to claims 1 to 6;
 - optionally, a dispersing agent a3); and
 - optionally, one or more of a compound a4) different from a1), a2) and a3).
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8. The resin composition A according to claim 7, wherein the particulate polyurea compound a2) is present at a content between 3 and 30 wt%, preferably between 4 and 20 wt%, more preferably between 5 and 15 wt% in view of the total weight of film forming resin a1) and polyurea compound a2).
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9. The resin composition A according to any of the claims 7 or 8, wherein
- the polyurea compound a2) is present between 2.5 and 20 wt%;
 - the film forming resin a1) is present between 1% and 97.5 wt%, preferably between 5% and 97.5 wt%, more preferably between 15% and 97.5 wt%, even more preferably between 30 and 97.5 wt%;
 - 25 • the dispersing agent a3) is present between 0 and 10 wt%, and
 - the one or more compound a4) is present between 0% and 96.5 wt%, preferably between 0% and 92.5 wt%, more preferably between 0% and 82.5 wt%, even more preferably between 0 and 78 wt%,
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- in view of the total weight of the resin composition A, the sum of weight percentages not exceeding 100%.
10. The resin composition A according to any of the claims 7 to 9, wherein the polyurea compound a2) is prepared in the presence of the film forming resin a1).

11. The resin composition A according to any of the claims 7 to 10, wherein the dispersing agent a3) is present and is selected from the group consisting of polyesters, polyurethanes and polyacrylates with pigment-affinic anionic, cationic or nonionic groups, and high molecular weight block copolymers with basic pigment affinic groups, and combinations thereof.
12. The resin composition A according to any of the claims 7 to 11, wherein a4) is an organic solvent a4)-1 and/or an additive a4)-2.
13. The resin composition A according to any of the claims 7 to 12, comprising a reactivity moderator e), which reactivity moderator is selected from the group consisting of carboxylic acids, compounds of the general formula R-SH, compounds comprising an X-H group having a pKa <12, R-OH, beta-diketones, beta-keto esters, alpha-hydroxy ketones, and mixtures thereof.
14. The resin composition A according to any of the claims 7 to 13, wherein
- the functional groups of the film forming resin a1) are selected from the group consisting of hydroxy, primary amine, secondary amine, mercaptane, activated unsaturated C=C moieties, carboxylic acid, epoxide, isocyanate, an activated methylene, methine species such as (derivatives of) acetyl acetone, acetoacetate or malonate, and mixtures thereof, and/or
 - the film forming resin a1) is selected from the group consisting of polyester resins, (meth)acrylic resins, polycarbonate resins, polyether resins, polyurethane resins, amino resins, and mixtures and hybrids thereof.
15. A crosslinkable composition comprising the resin composition A according to any of the claims 7 to 14, further comprising
- a film forming resin b) and/or a film forming resin a1'),
 - optionally, a crosslinker c),
 - optionally, a catalyst d) for catalyzing the reaction of the functional groups of film forming resin a1) and/or film forming resin b) with crosslinker c) if present, and/or with film forming resin b) and/or with film forming resin a1'),
 - optionally, a reactivity moderator e),
 - optionally, a volatile organic compound f),

- optionally, a reactive diluent g),
- optionally, another resin h), and
- optionally, another delustering composition i) that is different from or the same as particulate polyurea compound a2),

5 wherein the film forming resin a1), a1'), and b), and crosslinker c) if present, comprises at least two functional groups, each functional group having a functionality of at least 1, and/or at least one functional group having a functionality of at least 2;
 wherein the film forming resin a1), and/or film forming resin a1') and/or film forming resin b) is reactable with film forming resin b) and/or film forming resin a1') and/or crosslinker c) if present; and
 10 wherein film forming resin a1') and film forming resin b) are different from or the same as film forming resin a1).

16. The crosslinkable composition according to claim 15, wherein

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- the functional groups of the film forming resin a1') and b) are selected from the group consisting of hydroxy, primary amine, secondary amine, mercaptane, activated unsaturated C=C moieties, carboxylic acid, epoxide, isocyanate, an activated methylene, methine species such as (derivatives of) acetyl acetone, acetoacetate or malonate, and mixtures thereof, and/or
 - 20 • the film forming resin a1') and b) is selected from the group consisting of polyester resins, (meth)acrylic resins, polycarbonate resins, polyether resins, polyurethane resins, amino resins, and mixtures and hybrids thereof.

17. The crosslinkable composition according to claim 15 or 16, wherein the crosslinker c)
 25 comprises an oligomeric or polymeric compound with the functional groups being selected from the group consisting of isocyanate, hydroxy, primary amine, secondary amine, mercaptane, activated unsaturated C=C moieties, carboxylic acid, epoxide, an activated methylene, methine species such as (derivatives of) acetyl acetone, acetoacetate or malonate, and mixtures thereof.

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18. The crosslinkable composition according to any one of the claims 15 to 17, wherein the amount of polyurea compound a2) is between 0.5 and 25 wt%, preferably between 4 and 20 wt%, more preferably between 4 and 15 wt% relative to the total amount of film forming resin a1), particulate polyurea compound a2), and if present, dispersing agent a3), non-volatile part of additive a4)-2, crosslinker c), film forming resin b), film
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forming resin a1'), catalyst d), reactivity moderator e), reactive diluent g), resin h), and delustering composition i), in the crosslinkable composition.

19. A process for coating an article or a substrate, said process comprising the steps of:

- 5 (i) applying the crosslinkable composition according to claims 15-18,
 (ii) curing the applied composition,

to give a reduced gloss coating having a gloss measurement of at most 45 gloss units, preferably at most 30 gloss units, more preferably at most 20 gloss units at a 60° angle when applied at a Dry Film Thickness (DFT) of between 50 and 60 µm.

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20. A substrate coated with a composition according to any one of the claims 15-18.