What is claimed is:

1) An RMA crosslinkable composition for making thick coating layers comprising at least one crosslinkable component comprising reactive components A and B each comprising at least 2 reactive groups wherein the at least 2 reactive groups of component A are acidic protons (C-H) in activated methylene or methine groups *(the RMA donor group),*and the at least 2 reactive groups of component B are activated unsaturated groups (C=C) *(the RMA acceptor group),* to achieve crosslinking by Real Michael Addition (RMA) reaction, said composition further comprising a base catalyst (C), an X-H group containing component (D), of a nature different from A, that is also a Michael addition donor reactable with component B under the action of base catalyst C, wherein X is C, N, P, O or S and a sag control component (E).

2) The crosslinkable composition according to claim 1, in which the RMA acceptor groups B are acryloyl groups

3) The crosslinkable composition according to claim 1 or 2, in which the RMA donor groups A originate for more than 50% from malonate groups.

4) The crosslinkable composition according to any of claims 1-3, the X-H group of component D being characterized by a pKa (defined in aqueous environment) of at least one unit, preferably two units, less than that of the dominant type of C-H groups in component A.

5) The crosslinkable composition according to any of claims 1-4, wherein the pKa of the X-H group in component D is lower than 13, preferable lower than 12, more preferably lower than 11, most preferably lower than 10; and is preferably higher than 7, more preferably 8, more preferably higher than 8.5.

6) The crosslinkable composition according to claims 1 - 5, wherein component D is selected from one or more components from the group of
   a. component D(1) comprising C-H acidic protons (X is C) in activated methylene, methyl or methine groups,
   b. component D(2) comprising N-H acidic compound (X is N)

7) The crosslinkable composition according to claims 1 - 6 wherein component D(1) is an acetoacetate and/or acetylacetone.

8) The crosslinkable composition according to claims 1 - 6 wherein N-H group containing component D(2) contains the N-H group as part of a group Ar-NH-(C=O)-, -(C=O)-NH-(C=O)-, or of a group -NH-(O=S=O)- or is a heterocycle in which the nitrogen of the N-H group is contained in a heterocyclic ring.

9) The crosslinkable composition according to claim 8, wherein component D(2) is chosen from the group of imide derivatives, preferably cyclic, preferably an optionally substituted succinimide or glutarimide, hydantoin derivatives, preferably 5,5,dimethylhydrantoin, a sulfonamide, preferably an aromatic sulfonimide as benzene- or toluenesulfonamide, N-H group containing heterocycles, preferably a triazole, benzotriazole, pyrazole, nitro-imidazoles or uracil, preferably chosen from the group of succinimides, triazoles and pyrazoles.

10) The crosslinkable composition according to any of claims 1-9, wherein the N-H groups in component D(2) are present in an amount corresponding to at least 50 mole%, preferable at least 100 mole%, most preferably at least 150 mole% relative to the amount of base to be generated by catalyst C.

11) The crosslinkable composition according to claims 1-10, wherein N-H groups in component D(2) are present in an amount corresponding to no more than 30 mole%, preferably no more than 20, more preferably no more than 10 mole% relative to C-H donor groups from component A.

12) The crosslinkable composition according to claims 1 - 11 wherein C-H groups in component D(1) are present in an amount between 5 and 50 mol % preferably 10 – 40 mol% (to total RMA donor C-H)

13) The crosslinkable composition according to any of claims 1-12, wherein the base catalyst C comprises a strong base blocked by a carbon dioxide, preferably a salt of an nonacidic cation, preferably a quaternary ammonium or phosphonium cation, and a bicarbonate or a hydrocarbon substitued carbonate.

14) The crosslinkable composition according to anyone of claims 1 – 13 comprising

a. between 5 and 95 wt% of a component A with at least 2 acidic protons C-H in activated methylene or methine, and
b. between 5 and 95 wt% of a component B with at least 2 activated unsaturated groups (wt% relative to the total weight of the crosslinkable composition) and

c. a catalyst C that contains, or is able to generate a basic catalyst capable of activating the RMA reaction between components A and B, at levels of 0.0001 and 0.5 meq/g solid components,
N-H containing component D2 in an amount such that the amount of X-H in component D is at least 50 mole % relative to base generated by component C, and less than 30 mole% of C-H active groups from component A,
d. Optionally C-H containing component D(1) in an amount such that the amount of C-H groups in component D(1) are present in an amount between 5 and 50 mol % preferably 10 - 40 mol% (to total RMA donor C-H)
e. Optionally a sag control component E ,
f. optionally between 0.1 and 80 wt% of solvent (preferably less than 45wt%), preferably organic solvent preferably containing at least 1wt% of a primary alcohol and optionally between 0.1 and 10 wt% water,
g. optionally at least 0.5wt% water.

15) A kit of parts for the manufacture of the composition according to claims 1 - 14 comprising a part 1 comprising components A and B and part 2 comprising component C and D or part 1 comprising components A, B and D and part 2 comprising component C.

16) Use of the crosslinkable composition according to anyone of claims 1 - 14 for the manufacture of coating compositions, films or inks.

17) Coating composition comprising the crosslinking composition according to anyone of claims 1 - 14 and further comprising one or more coating additives like pigments, co-binder, solvents etc.

18) A process for the manufacture of a coating composition according to claim 17 comprising contacting a composition comprising the cross-linkable components A and B with catalyst C shortly before use.

19) A process for making a coating layer having a fully cured dry thickness of at least 50, preferably at least 60, 75, 100 and more preferably at least 125 micrometer and having a good surface appearance and hardness of the resulting cured composition comprising , applying a layer of the cross-linkable composition according to claims 1-14 or a coating composition according to claim 17 on a substrate and allowing the curing thereof at temperatures between 10 and 60 °C.

20) The use of the component D described in any one of the preceding claims as an additive to RMA cross-linkable compositions for preparing thick coating layers having a dry thickness of at least 50, preferably at least 60, 75, 100 and more preferably at least 125 micrometer and having a good surface appearance and hardness of the resulting cured composition, in particular in a coating.

21) A RMA coating additive mixture comprising two or more different X-H group containing components D that are Michael addition donor reactable with a component B comprising at least 2 activated unsaturated groups (C=C) (RMA acceptor group) under the action of a base catalyst C, wherein X is C, N, P, O or S, comprising

a. one or more components D1 comprising C-H acidic protons in activated methylene or methine groups, preferably in substituted or unsubstituted acetoacetate or acetoacetyl groups and
b. one or more components D different from component D1, preferably comprising N-H containing components D2.

22) The RMA coating additive mixture according to claim 21, comprising

a. one or more components D1 selected from the group of substituted or unsubstituted acetoacetate or acetoacetyl containing components and
b. one or more components D2 selected from the group of components D containing the N-H as part of a group –Ar-NH-(C=O)-, -(C=O)-NH-(C=O)-, or of a group -NH-(O=S=O)- or a heterocycle in which the nitrogen of the N-H group is contained in a heterocyclic ring.

23) A method for improving appearance and hardness of a coating from a RMA cross-linkable coating composition comprising reactive components A and B each comprising at least 2 reactive groups and comprising a base cross-linking catalyst C, wherein the at least 2 reactive groups of component A are acidic protons (C-H) in activated methylene or methine groups (the RMA donor group) and the at least 2 reactive groups of component B are activated unsaturated groups (C=C) (the RMA acceptor group), characterised in that to the cross-linkable coating composition an additive mixture is added according to claim 22 or 23.

24) A process for the manufacture of a RMA cross-linkable composition, preferably according to claims 1 – 14, comprising the steps of

a. Providing a solution in an organic solvent of a component A having at least 2 acidic protons C-H in activated methylene or methane, and subsequently
b. Providing in said solution a first polyurea reaction product in the form of anisotropic colloidal particles, preferably by mixing a first polyisocyanate and a first amine, preferably monoamine, and react to form the first polyurea in-situ in the form of anisotropic colloidal particles, then
c. Mixing component B having at least 2 activated unsaturated groups (wt% relative to the total weight of the crosslinkable composition) before or after step d) and
d. Adding a second polyisocyanate and/or a second amine to form a second polyurea reaction product different from the first polyurea reaction product, and wherein the second polyurea reaction product is precipitated in the presence of colloidal particles of the first reaction product, then
e. Adding a catalyst C, preferably shortly before use, that contains, or is able to generate a basic catalyst capable of activating the RMA reaction between components A and B,
f. Optionally adding component D
g. Wherein the composition comprises between 0.1 and 80 wt% of solvent (preferably less than 45wt%), preferably containing at least 1wt% of a primary alcohol,
h. optionally adding at least 0.5wt% water.

What is claimed is:

1) An RMA crosslinkable composition for making thick coating layers comprising at least one crosslinkable component comprising reactive components A and B each comprising at least 2 reactive groups wherein the at least 2 reactive groups of component A are acidic protons (C-H) in activated methylene or methine groups *(the RMA donor group),*and the at least 2 reactive groups of component B are activated unsaturated groups (C=C) *(the RMA acceptor group),* to achieve crosslinking by Real Michael Addition (RMA) reaction, said composition further comprising a base catalyst (C), an X-H group containing component (D), of a nature different from A, that is also a Michael addition donor reactable with component B under the action of base catalyst C, wherein X is C, N, P, O or S and a sag control component (E).

2) The crosslinkable composition according to claim 1, in which the RMA acceptor groups B are acryloyl groups.

3) The crosslinkable composition according to claim 1 or 2, in which the RMA donor groups A originate for more than 50% from malonate groups.

4) The crosslinkable composition according to any of claims 1-3, the X-H group of component D being characterized by a pKa (defined in aqueous environment) of at least one unit, preferably two units, less than that of the dominant type of C-H groups in component A.

5) The crosslinkable composition according to any of claims 1-4, wherein the pKa of the X-H group in component D is lower than 13, preferable lower than 12, more preferably lower than 11, most preferably lower than 10; and is preferably higher than 7, more preferably 8, more preferably higher than 8.5.

6) The crosslinkable composition according to claims 1 - 5, wherein component D is selected from one or more components from the group of

a. component D(1) comprising C-H acidic protons (X is C) in activated methylene, methyl or methine groups,

b. component D(2) comprising N-H acidic compound (X is N).

7) The crosslinkable composition according to claim 6 wherein component D(1) is an acetoacetate and/or acetylacetone.

8) The crosslinkable composition according to claims 1 - 6 wherein N-H group containing component D contains the N-H group as part of a group Ar-NH-(C=O)-, -(C=O)-NH-(C=O)-, or of a group -NH-(O=S=O)- or is a heterocycle in which the nitrogen of the N-H group is contained in a heterocyclic ring.

9) The crosslinkable composition according to claim 8, wherein component D is chosen from the group of imide derivatives, preferably cyclic, preferably an optionally substituted succinimide or glutarimide, hydantoin derivatives, preferably 5,5,dimethylhydrantoin, a sulfonamide, preferably an aromatic sulfonimide as benzene- or toluenesulfonamide, N-H group containing heterocycles, preferably a triazole, benzotriazole, pyrazole, nitro-imidazoles or uracil, preferably chosen from the group of succinimides, triazoles and pyrazoles.

10) The crosslinkable composition according to claims 1 - 9 wherein C-H groups in component D(1) are present in an amount between 5 and 50 mol % preferably 10 – 40 mol% (to total RMA donor C-H).

11) The crosslinkable composition according to anyone of claims 1 – 10 comprising

a. between 5 and 95 wt% of a component A with at least 2 acidic protons C-H in activated methylene or methine, and
b. between 5 and 95 wt% of a component B with at least 2 activated unsaturated groups (wt% relative to the total weight of the crosslinkable composition) and
c. a catalyst C that contains, or is able to generate a basic catalyst capable of activating the RMA reaction between components A and B, at levels of 0.0001 and 0.5 meq/g solid components,
d. component D in an amount such that the amount of X-H in component D is at least 50 mole % relative to base generated by component C, and less than 30 mole% of C-H active groups from component A,
e. optionally additional different C-H containing component D(1) in an amount such that the amount of C-H groups in component D(1) are present in an amount between 5 and 50 mol % preferably 10 – 40 mol% (to total RMA donor C-H)

f. a sag control component E,
g. optionally between 0.1 and 80 wt% of solvent (preferably less than 45wt%), preferably organic solvent preferably containing at least 1wt% of a primary alcohol and,
h. optionally between 0.1 and 10 wt% water, optionally at least 0.5wt% water.

12) A kit of parts for the manufacture of the composition according to claims 1 – 11 comprising a part 1 comprising components A and B and part 2 comprising component C and D or part 1 comprising components A, B and D and part 2 comprising component C.

13) Use of the crosslinkable composition according to anyone of claims 1 – 11 for the manufacture of coating compositions, films or inks.

14) Coating composition comprising the crosslinking composition according to anyone of claims 1 – 11 and further comprising one or more coating additives like pigments, co-binder, solvents etc.

15) The use of the component D described in any one of the preceding claims as an additive to RMA cross-linkable compositions for preparing thick coating layers having a dry thickness of at least 50, preferably at least 60, 75, 100 and more preferably at least 125 micrometer and having a good surface appearance and hardness of the resulting cured composition, in particular in a coating.

16) A RMA coating additive mixture comprising two or more different X-H group containing components D that are Michael addition donor reactable with a component B comprising at least 2 activated unsaturated groups (C=C) (RMA acceptor group) under the action of a base catalyst C, wherein X is C, N, P, O or S, comprising

a. one or more components D1 comprising C-H acidic protons in activated methylene or methine groups, preferably in substituted or unsubstituted acetoacetate or acetoacetyl groups and
b. one or more components D different from component D1, preferably comprising N-H containing components D2.