

**Claims**

1. A polymer composition (PC1) comprising
  - a) one stage (A) comprising a polymer (A1) having a  
5 glass transition temperature of less than 10°C
  - b), one stage (B) comprising a polymer (B1) having a  
glass transition temperature of at least 60°C and
  - c) and a polymer (C1) having a glass transition  
temperature of at least 30°C
- 10 characterized in that at least the component a) and the  
component b) of composition (PC1) are part of a multistage  
polymer (MP1), and characterized in that the polymer (C1) has  
a mass average molecular weight Mw of at least 100 000g/mol  
and that the component c) represents at most 40wt% of the  
15 composition based on a) b) and c).
2. The polymer composition according to claim 1, characterized in  
that the polymer (C1) has a mass average molecular weight Mw  
between 100 000g/mol and 1 000 000g/mol.
- 20 3. The polymer composition according to claim 1, characterized in  
that the polymer (C1) has a mass average molecular weight Mw  
below 700 000g/mol.
- 25 4. The polymer composition according to claim 1, characterized  
in that the polymer (C1) has a mass average molecular weight  
Mw between 140 000g/mol and 500 000g/mol.
5. The polymer composition according to claim 1, characterized in  
30 that the component c) represents between 5wt% and 35wt% of the  
composition based on a,) b) and c).
6. The polymer composition according to claim 1, characterized in  
that the component c) represents between 7wt% and less than  
35 25wt% of the composition based on a,) b) and c).
7. The polymer composition according to claim 1, characterized in  
that the component c) represents advantageously more than  
10wt% of the composition based on a,) b) and c).

8. The polymer composition according to claim 1, characterized in that the component c) represents between 10wt% and less than 20wt% of the composition based on a,) b) and c).
- 5 9. The polymer composition according to claim 1, characterized in that the component c) represents between 10wt% and less than 20wt% of the composition based on a,) b) and c) and that the polymer (C1) has a mass average molecular weight Mw below
- 10 700 000g/mol.
10. The polymer composition according to claim 1, characterized in that the stage (A) is the first stage and that stage (B) comprising polymer (B1) is grafted on stage (A) comprising
- 15 polymer (A1).
11. The polymer composition according to any of claims 1 to 10 characterized in that the polymer (C1) is a (meth) acrylic polymer.
- 20 12. The polymer composition according to any of claims 1 to 11 characterized in that the polymer (C1) comprises at least 80wt% of monomers C1 to C4 alkyl methacrylate and/or C1 to C8 alkyl acrylate monomers.
- 25 13. The polymer composition according to any of claims 1 to 12 characterized in that the polymer (C1) comprises a functional comonomer.
- 30 14. The polymer composition according to claim 13 characterized in that the functional monomer is chosen from glycidyl (meth)acrylate, acrylic or methacrylic acid, the amides derived from these acids, such as, for example, dimethylacrylamide, 2-methoxyethyl acrylate or methacrylate,
- 35 2-aminoethyl acrylates or methacrylates are optionally quaternized, polyethylene glycol (meth) acrylates.
15. The polymer composition according to any of claims 1 to 10 characterized in that the polymer (B1) is crosslinked.

16. The polymer composition according to any of claims 1 to 10 characterized in that the polymers (B1) and (C1) are acrylic or methacrylic polymers.

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17. The polymer composition according to any of claims 1 to 10 characterized that the polymer (A1) comprises butadiene as monomer.

10 18. The polymer composition according to any of claims 1 to 10 characterized that the polymers (A1), (B1) and (C1) are acrylic or methacrylic polymers.

15 19. The polymer composition according to claims 18, characterized that at least 80wt% the acrylic or methacrylic monomers of the polymers (A1), (B1) or (C1) are chosen from methyl acrylate, propyl acrylate, isopropyl acrylate, butyl acrylate, tert-butyl acrylate, methyl methacrylate, ethyl methacrylate, butyl methacrylate and mixtures thereof.

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20. A method for manufacturing the polymer composition according to any of claims 1 to 19 comprising the steps of

25 a) polymerizing by emulsion polymerization of a monomer or monomer mixture ( $A_m$ ) to obtain one layer in stage (A) comprising polymer (A1) having a glass transition temperature of less than 10°C

30 b) polymerizing by emulsion polymerization of a monomer or monomer mixture ( $B_m$ ) to obtain layer in stage (B) comprising a polymer (B1) having a glass transition temperature of at least 60°C

35 c) polymerizing by emulsion polymerization of a monomer or monomer mixture ( $C_m$ ) to obtain a layer in stage (C) comprising a polymer (C1) having a glass transition temperature of at least 30°C

characterized in that the polymer (C1) has a mass average molecular weight  $M_w$  of at least 100 000g/mol and that the

component c) represents at most 40wt% of the composition based on a), b) and c).

21. A method for manufacturing the polymer composition (PC1) according to any of claims 1 to 19 comprising the steps of
- a) polymerizing by emulsion polymerization of a monomer or monomer mixture ( $A_m$ ) to obtain one layer in stage (A) comprising polymer (A1) having a glass transition temperature of less than 10°C,
  - b) polymerizing by emulsion polymerization of a monomer or monomer mixture ( $B_m$ ) to obtain layer in stage (B) comprising a polymer (B1) having a glass transition temperature of at least 60°C,
  - both together steps a) and b) giving a multistage polymer (MP1) and step
  - c) blending multistage polymer (MP1) with a polymer (C1) having a glass transition temperature of at least 30°C
- characterized that the polymer (C1) has a mass average molecular weight  $M_w$  of at least 100 000g/mol and that the component c) represents at most 40wt% of the composition obtained in steps a), b) and c).
22. The method according to claim 20 or 21, characterized in that the step a) is made before step b).
23. The method according to any of claims 20 to 21, characterized in that the step b) is performed in presence of the polymer (A1) obtained in step a).
24. The method according to any of claims 20 to 21, characterized that the steps a), b) and c) are performed in that order.
25. The method according to any of claims 20 to 24, characterized in that the method comprises an additional step d) recovering of the polymer composition.
26. The method according to claim 25, characterized in that step d) is made by coagulation or by spray-drying.

27. The method according to any of claims 20 to 24, characterized in that the polymer (C1) has a mass average molecular weight Mw between 100 000g/mol and 1 000 000g/mol.
- 5 28. The method according to any of claims 20 to 24, characterized in that the polymer (C1) has a mass average molecular weight Mw below 700 000g/mol.
- 10 29. The method according to any of claims 20 to 24, characterized in that the polymer (C1) has a mass average molecular weight Mw between 140 000g/mol and 500 000g/mol.
- 15 30. The method according to any of claims 20 to 24, characterized in that the component c) represents between 10wt% and less than 20wt% of the composition based on a,) b) and c).
- 20 31. The method according to any of claims 20 to 24, characterized in that the component c) represents between 10wt% and less than 20wt% of the composition based on a,) b) and c) and that the polymer (C1) has a mass average molecular weight Mw below 700 000g/mol.
- 25 32. Use of the polymer composition according to any of claims 1 to 19 or obtained by the method according to any of claims 20 to 31 as an impact modifier.
- 30 33. A polymer composition (PC2) comprising  
i)a polymer (P2) and  
ii)a polymer composition (PC1) comprising  
a) one stage (A) comprising a polymer (A1) having a glass transition temperature of less than 10°C  
b), one stage (B) comprising a polymer (B1) having a glass transition temperature of at least 60°C and  
35 c) a polymer (C1) having a glass transition temperature of at least 30°C  
characterized in that the polymer (C1) has a mass average molecular weight Mw of at least 100 000g/mol and that the

component c) represents at most 40wt% of the composition based on a), b) and c).

34. The polymer composition according to claim 33, characterized in that the polymer composition (PC1) is made according to the method of any of claims 20 to 31.

35. The polymer composition according to claims 33 or 34, characterized in that the polymer (P2) is thermoset polymer or its precursor, or a thermoplastic polymer or a structural adhesive.

36. The polymer composition according to claims 33 or 34, characterized in that the polymer (C1) has a mass average molecular weight Mw between 100 000g/mol and 1 000 000g/mol

37. The polymer composition according to claims 33 or 34, characterized in that the polymer (C1) has a mass average molecular weight Mw below 700 000g/mol.

38. The polymer composition according to claims 33 or 34, characterized in that the polymer (C1) has a mass average molecular weight Mw between 140 000g/mol and 500 000g/mol.

39. The polymer composition according to claims 33 or 34, characterized in that the component c) represents between 10wt% and less than 20wt% of the composition based on a,) b) and c).

40. The polymer composition according to claims 33 or 34, characterized in that the component c) represents between 10wt% and less than 20wt% of the composition based on a,) b) and c) and that that the polymer (C1) has a mass average molecular weight Mw below 700 000g/mol.

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