[Brief description]

[024a] In an aspect, there is provided a pre-shaped preform kept in a fixed shape suitable for use in a process of infusion, vacuum bag molding, pressure bag molding, resin transfer molding (RTM), reaction injection molding (RIM), reinforced reaction injection molding (R-RIM), press molding or compression molding, comprising

a) a fibrous substrate and

b) a multi stage polymer in form of spherical polymer particles having a weight average particle size between 20 nm and 800 nm,

wherein the quantity of multi stage polymer in the preform is between 6wt% and 25wt%, based on the sum of the two compounds a) and b).

[025] Surprisingly it has been found that a preform comprising

a) a fibrous substrate and

b) a multi stage polymer,

wherein the quantity of multi stage polymer in the preform is between 3wt% and 50wt%, keeps its shape.

[026] Surprisingly it has also been found that a preform comprising

a) a fibrous substrate and

b) a multi stage polymer,

wherein the quantity of multi stage polymer in the preform is between 3wt% and 50wt%, can be used for manufacturing a polymeric composite material or mechanical or structured parts or articles comprising the polymeric composite material.

[0026a] In another aspect, there is provided a process for manufacturing the pre-shaped preform kept in a fixed shape suitable for use in a process of infusion, vacuum bag molding, pressure bag molding, resin transfer molding (RTM), reaction injection molding (RIM), reinforced reaction injection molding (R-RIM), press molding or compression molding as defined above, said process comprising the steps of

a) bringing into contact a fibrous substrate and an aqueous dispersion of a multistage polymer, wherein the multistage polymer is in form of spherical polymer particles having a weight average particle size between 20 nm and 800 nm, and wherein the quantity of the multi stage polymer in the preform is between 6wt% and 25wt%, based on the sum of the fibrous substrate and the multistage polymer,

b) drying the product of step a),

c) heating the dried product of b).

[027] Surprisingly it has also been found that a process for manufacturing a preform comprising the steps of

a)bringing into contact a fibrous substrate and an aqueous dispersion of a multistage polymer

b) drying the product of step a),

c) heating the dried product of b),

wherein the quantity of multi stage polymer in the preform is between 3wt% and 50wt% yields to a preform that keeps its shape.

[0027a] In another aspect, there is provided the use of the preform as defined above for manufacturing a polymeric composite material or mechanical or structured parts or articles comprising the polymeric composite material.

Claims

1. A pre-shaped preform kept in a fixed shape suitable for use in a process of infusion, vacuum bag molding, pressure bag molding, resin transfer molding (RTM), reaction injection molding (RIM), reinforced reaction injection molding (R-RIM), press molding or compression molding, comprising
   a) a fibrous substrate and
   b) a multi stage polymer in form of spherical polymer particles having a weight average particle size between 20 nm and 800 nm,

   wherein the quantity of multi stage polymer in the preform is between 6wt% and 25wt%, based on the sum of the two compounds a) and b).

2. The preform according to claim 1 characterized that the quantity of multi stage polymer is between 7wt% and 25wt%, based on the sum of the two compounds a) and b).

3. The preform according to claim 1 or 2 characterized that the multistage polymer is in form of spherical polymer particles having a weight average particle size between 25nm and 600nm.

4. The preform according to any of claims 1 to 3 characterized that the multi stage polymer comprises
   a) one stage (A) comprising a polymer (A1) having a glass transition temperature of less then 0°C
   b) one stage (B) comprising a polymer (B1) having a glass transition temperature of at least 30°C.

5. The preform according to claim 4 characterized that the polymers (A1) and (B1) are acrylic or methacrylic polymers.

6. The preform according to claim 4 characterized that the polymer (A1) is a silicone rubber based polymer.

7. The preform according to claim 4 characterized that the polymers (A1) comprises at least 50wt% of polymeric units coming from isoprene or butadiene.

8. The preform according to any of claims 4 to 7 characterized that the stage (A) is the first stage and that stage (B) comprising polymer (B1) is grafted on stage (A) comprising polymer (A1).

9. The preform according to any of claims 1 to 8 characterized that the fibrous substrate comprises fibers having an aspect ratio of at least 1000.

10. The preform according to any of claims 1 to 9 characterized that the fibrous substrate is chosen from stacked or folded fibrous mats or non-woven reinforcements or bundles of fibers or mixtures thereof.

11. A process for manufacturing the pre-shaped preform kept in a fixed shape suitable for use in a process of infusion, vacuum bag molding, pressure bag molding, resin transfer molding (RTM), reaction injection molding (RIM), reinforced reaction injection molding (R-RIM), press molding or compression molding according to any of claims 1 to 10, said process comprising the steps of

a) bringing into contact a fibrous substrate and an aqueous dispersion of a multistage polymer, wherein the multistage polymer is in form of spherical polymer particles having a weight average particle size between 20 nm and 800 nm, and wherein the quantity of the multi stage polymer in the preform is between 6wt% and 25wt%, based on the sum of the fibrous substrate and the multistage polymer,

b) drying the product of step a),

c) heating the dried product of b).

12. The process according to claim 11 characterized that step b) is made by heating to at least 45°C.

13. The process according to claim 11 characterized that step c) is made in a mold at a temperature between 100°C and 250°C.

14. Use of the pre-shaped preform kept in a fixed shape suitable for use in a process of infusion, vacuum bag molding, pressure bag molding, resin transfer molding (RTM), reaction injection molding (RIM), reinforced reaction injection molding (R-RIM), press molding or compression molding according to any of claims 1 to 10 for manufacturing a polymeric composite material or mechanical or structured parts or articles comprising the polymeric composite material.