CLAIMS

What is claimed is:

1. A molding mass composition comprising:

a liquid component;

wherein the liquid component includes a water component; and

a non-liquid soluble solid component;

wherein the non-liquid soluble solid component includes a starch component and a fiber component;

wherein a total liquid content in the molding mass composition is in a range of 57 wt. % to 65 wt. % based on a total mass of the molding mass composition;

wherein a starch/fiber wt. % ratio is in a range of

94 wt. % of the starch component: 6 wt. % of the fiber component to

49 wt. % of the starch component: 51 wt. % of the fiber component;

wherein the starch component includes a plurality of starch granules having a select granule diameter size range including a granule diameter lower limit and a granule diameter upper limit;

wherein the fiber component includes a plurality of fibers, each of the plurality of fibers having a fiber length in a range of 1-250 times the granule diameter upper limit and the fiber length of the fiber component has a size dispersion in a range of 10 to 2500 microns;

wherein the starch component comprises a physically modified starch having a pregelatinized form, the pregelatinized starch being in a range of 2 wt. % to 26 wt. % based on the total mass of the starch component; and

wherein a molding mass based on the molding composition including the pregelatinized starch is elastic and cohesive which in turn assists in the distribution of the molding mass substantially evenly throughout a mold while simultaneously limiting or avoiding the occurrence of voids during a molding mass deposition process without requiring shuttle mechanism conditioning.

2. The molding mass composition of claim 1, wherein in the starch component has a size dispersion in a range of 1 μm to 120 μm.

3. The molding mass composition of claim 1, wherein the starch component is a starch component selected from the group consisting of a native starch, a chemically modified native starch, a physically modified native starch, a genetically modified native starch, and a combination of at least two of the afore-mentioned starch components.

4. The molding mass composition of claim 1, wherein the starch component includes a native starch.

5. The molding mass composition of claim 4, wherein the native starch includes a native potato starch.

6. The molding mass composition of claim 1 further comprising a mold release agent.

7. The molding mass composition of claim 6, wherein the mold release agent comprises a saturated long chain fatty acid having a chain length including a minimum of twelve carbon atoms.

8. The molding mass composition of claim 7, wherein the mold release agent comprises an acid selected from the group consisting of a lauric acid, a myristic acid, a palmitic acid, a stearic acid, and an arachidic acid.

9. The molding mass composition of claim 6, wherein the mold release agent is in a form of a powder having a plurality of mold release particles, each particle having a mesh size of less than 80 mesh.

10. The molding mass composition of claim 6, wherein the mold release agent is in a ratio of 0.1 to 2.4 wt. % based on a total mass of the non-liquid soluble solid component in the molding mass composition.

11. The molding mass composition of claim 1 further comprising a texturizer.

12. The molding mass composition of claim 11, wherein the texturizer is selected from the group consisting of a reactive inorganic component, a non-reactive inorganic component, and a combination of the two afore-mentioned components.

13. The molding mass composition of claim 1,

wherein the molding mass composition comprises a texturizer including an inorganic component; and

wherein an amount content of the inorganic component in the molding mass composition is within a range of greater than 0 to 16.5 wt. % based on a total non-liquid soluble solid component of the molding mass composition.

14. The molding mass composition of claim 1 further comprising a plasticizer additive, wherein the plasticizer is a urea.

15. The molding mass composition of claim 13, wherein the urea has a concentration in a range of greater than 0 wt. % to 9 wt. % based on a total mass of the starch component.

16. The molding mass composition of claim 1 further comprising a plurality of borate ions at a concentration in a range of greater than 0 to 2 mmol of borate per kilogram of the starch component.

17. A method for preparing a molding mass comprising the steps of:

selecting a liquid component;

wherein the liquid component includes a water component;

selecting a non-liquid soluble solid component;

wherein the non-liquid soluble solid component includes a starch component and a fiber component;

wherein a starch/fiber wt. % ratio is in a range of

94 wt. % of the starch component: 6 wt. % of the fiber component

to

49 wt. % of the starch component: 51 wt. % of the fiber component;

wherein the starch component includes a plurality of starch granules having a select granule diameter size range including a granule diameter lower limit and a granule diameter upper limit; and

wherein the fiber component includes a plurality of fibers, each of the plurality of fibers having a fiber length in a range of 1-250 times the granule diameter upper limit and the fiber length of the fiber component has a size dispersion in a range of 10 to 2500 microns;

mixing and kneading the liquid component and the non-liquid soluble solid component using a preparation system for forming a molding mass having a first plastic-elastic texture and consistency characterized by a total liquid content in the molding mass including the liquid content in a range of 57 to 65 wt. % based on a total mass of the molding mass composition; and

wherein the starch component comprises a physically modified starch having a pregelatinized form, the pregelatinized starch being in a range of 2 wt. % to 26 wt. % based on the total mass of the starch component;

wherein the molding mass including the pregelatinized starch is elastic and cohesive molding mass which in turn assists in the distribution of the molding mass substantially evenly throughout a mold while simultaneously limiting or avoiding the occurrence of voids during a molding mass deposition process without requiring shuttle mechanism conditioning.

18. The method of claim 17 wherein the mixing and kneading step comprises a step of adding step-wise the liquid component to the non-liquid soluble solid component during the mixing and kneading step.

19. The method for preparing a molding mass according to claim 17 further comprising a step of:
producing a vacuum in the preparation system for substantially removing or preventing a gas from entering into the molding mass.

20. A method of using the molding mass prepared according to claim 17 further comprising the steps of:
providing a target mold in an open configuration; and
depositing a select portion of the molding mass into the target mold for filling a detail of the mold;
wherein the select portion has a select portion volume less than a volume of the target mold.

21. The method of using the molding mass prepared according to claim 20 for forming a molded article further comprising the steps of:
closing the target mold as necessary; and
heating the target mold filled with the molding mass to a select curing temperature in a range of 185 ºC to 225 ºC for a select curing time period for thermally curing the molding mass for forming the molded article having a second plastic-elastic texture and consistency characterized by a molded article residual liquid content of ≤ 6 wt. % based on a total mass of the molded article;
wherein after thermal curing, no substantial steam pressure remains in a structural matrix of the molded article; and
wherein after thermal curing, the molding mass is solidified beyond a glass point of the structural matrix of the molded article.

22. A method of processing the molded article according to claim 21 further comprising the steps of:
passing the molded article into an enclosed humidification section or chamber; and

providing a humid air flow into the humidification section or chamber until the molded article has a water activity in a range of .45 to .70;
wherein a safe microbiological condition is maintained in the enclosed humidification section or chamber.

23. A molding mass including the molding mass composition of claim 1, wherein the molding mass composition undergoes a mixing and kneading process for formation of the molding mass having a first plastic-elastic texture and consistency.

24. A biodegradable, compostable coating solution adapted for a molded article formed from the molding mass composition of claim 1 comprising:
a compostable liquid solvent base; and
a compostable solids portion.

25. The biodegradable, compostable coating solution of claim 24, wherein the compostable liquid solvent base comprises water.

26. A biodegradable, compostable coating system comprising:
a coating zone comprising a spray device configured for spraying for the biodegradable, compostable coating solution of claim 24 and a heating device.