

CLAIMS

What is claimed is:

1. A molding mass composition comprising:
 - 5 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;
 - 10 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;
 - 15 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.
- 20 2. The molding mass composition of claim 1, wherein the fiber component has a size
dispersion of in a range of 10 to 2500 microns.
3. The molding mass composition of claim 1, wherein in the starch component has a size
25 dispersion in a range of 1 μm to 120 μm .
4. 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,
30 and a combination of at least two of the afore-mentioned starch components.
5. The molding mass composition of claim 1, wherein the starch component includes a
native potato starch.

6. The molding mass composition of claim 1, wherein the starch component comprises a physically modified starch having a pregelatinized form.
- 5 7. The molding mass composition of claim 1 further comprising a mold release agent.
8. The molding mass composition of claim 7, wherein the mold release agent comprises a saturated long chain fatty acid having a chain length including a minimum of twelve carbon atoms.
- 10 9. The molding mass composition of claim 8, 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.
- 15 10. The molding mass composition of claim 7, 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.
11. The molding mass composition of claim 7, wherein the mold release agent is in a ratio of
- 20 0.1 to 2.4 wt. % based on a total mass of the non-liquid soluble solid component in the molding mass composition.
12. The molding mass composition of claim 1 further comprising a texturizer.
- 25 13. The molding mass composition of claim 12, 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.
14. The molding mass composition of claim 1,
- 30 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.

15. The molding mass composition of claim 1 further comprising a plasticizer additive, wherein the plasticizer is a urea.
- 5 16. The molding mass composition of claim 14, 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.
- 10 17. 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.
- 15 18. 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
20 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
25 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;
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
30 including the liquid content in a range of 57 to 65 wt. % based on a total mass of the molding mass composition.

19. The method of claim 18 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.
- 5 20. The method for preparing a molding mass according to claim 18 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.
- 10 21. The method for preparing a molding mass according to claim 18 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
15 the mold;
wherein the select portion has a select portion volume less than a volume of the target mold.
- 20 22. The method for preparing a molding mass according to claim 21 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 °C to 225 °C for a select curing time period for thermally curing the molding mass for forming the molded article having a second plastic-elastic texture and
25 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
30 structural matrix of the molded article.
23. The method for preparing a molding mass according to claim 22 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.

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24. 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.

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25. A biodegradable, compostable coating solution for a molded article comprising;
a compostable liquid solvent base; and
a compostable solids portion

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

27. A biodegradable, compostable coating system comprising:
a coating zone comprising a spray device and a heating device.

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