CLAIMS

1. Method of manufacturing a sheet comprising photocatalytic nanoparticles, the method comprising the steps of:

- impregnating (41, 42) the sheet (10) with a polymer resin, preferably comprising wear resistant particles;
- spraying (43, 40) the sheet (10), freshly impregnated with the polymer resin in an uncured and wet state, with an impregnation fluid composition comprising dispersed photocatalytic nanoparticles;
- drying and/or at least partly curing (44, 45) said impregnated sheet comprising the polymer resin and the impregnation fluid.

2. The method as claimed in claim 1, wherein the sheet comprises cellulose fibres.

3. The method as claimed in claim 1 or 2, wherein the impregnation fluid composition comprises a solvent comprising water.

4. The method as claimed in any one of the preceding claims wherein the method comprises a step between impregnating and spraying step in which step the polymer resin is partly dried.

5. A method of producing a laminate board or panel (1) by arranging a sheet produced according any one of the preceding claims, on a core, preferably an HDF panel and applying heat and pressure.

6. The method as claimed in claim 5, wherein the board is a floorboard.

7. Method of producing a WFF panel comprising photocatalytic nanoparticles, the method comprises the step of:

1) scattering of a dry mix comprising wood fibres, a thermosetting resin, such as a polymer resin preferably a melamine formaldehyde resin, and wear resistant particles on a core;

2) applying an organic solvent on the mix on the core;

3) spraying an impregnation fluid composition comprising dispersed photocatalytic nanoparticles, preferably dispersed in water; and

4) applying heat and pressure.

8. The method as claimed in claim 7, wherein the organic solvent comprising ketone, such as aceton and methyl ethyl ketone, and/or alcohol, such as ethanol, propanol and methanol, and/or acetate, such as butyl acetate, ethyl acetate.

9. The method as claimed in claim 7 wherein organic solvent is ethanol.

10. The method as claimed in any one of the claims 7 - 9 wherein the method comprising the step of applying, preferably before step 2, a fluid with a wetting agent on the mix, preferably in the form of water containing 1% weight content of BYK-348 from BYK Chemie.

11. The method as claimed in claim 10 wherein the method comprising the step of applying the fluid with the wetting agent and the organic solvent together.

12. The method as claimed in any one of the claims 7 - 11 wherein the method comprising the step of applying the impregnation fluid and the organic solvent together.

13. The method as claimed in claim in any one of the preceding claims wherein said photocatalytic nanoparticles have a crystallinity of at least 50 %.

14. The method as claimed in claim in any one of the preceding claims wherein said nanoparticles have a primary particle size of < 50 nm, such as < 30 nm preferably a primary particle size of < 20 nm such as < 10 nm.

15. The method as claimed in claim in any one of the preceding claims wherein the concentration of said photocatalytic nanoparticle impregnation fluid is > 1 wt%, such as > 5 wt% preferably a concentration of said nanoparticles > 10 wt% such as > 15 wt% and even more preferably a concentration of said nanoparticles > 20 wt% such as > 25 wt%.

16. The method as claimed in claim in any one of the preceding claims wherein the amount of impregnation fluid composition per square meter of the applied surface is in the range 1-200 ml/m^2 such as in the range 5-100 ml/m^2 and preferably in the range 10-50 ml/m^2 such as 20-40 ml/m^2

17. Panel produced with the method as claimed in any one of the preceding claims wherein said photocatalytic nanoparticles are homogenously embedded in the uppermost layer of the panel.

18. The panel produced as claimed in claim 17, wherein said photocatalytic nanoparticles are homogenously embedded in the final panel at a thickness of > 0.1 µm; > 1 µm; > 10 µm; > 50 µm; > 100 µm; > 500 µm; > 1000 µm.

CLAIMS

1. Method of manufacturing a sheet comprising photocatalytic nanoparticles, the method comprising the steps of:

- impregnating the sheet with a polymer resin;
- spraying the sheet, freshly impregnated with the polymer resin in an uncured and wet state, with an impregnation fluid composition comprising dispersed photocatalytic nanoparticles;
- drying and/or at least partly curing said impregnated sheet comprising the polymer resin and the impregnation fluid.

2. The method as claimed in claim 1, wherein the polymer resin comprises wear resistant particles.

3. The method as claimed in claim 1 or 2, wherein the sheet comprises cellulose fibres.

4. The method as claimed in any one of the preceding claims, wherein the impregnation fluid composition comprises a solvent comprising water.

5. The method as claimed in any one of the preceding claims wherein the method comprises a step between impregnating and spraying step in which step the polymer resin is partly dried.

6. A method of producing a laminate board or panel by arranging a sheet produced according any one of the preceding claims on a core, and applying heat and pressure.

7. The method as claimed in claim 6, wherein the core is an HDF panel.

8. The method as claimed in claim 6 or 7, wherein the board is a floorboard.

9. Method of producing a wood fibre floor panel comprising photocatalytic nanoparticles, the method comprises the step of:

1) scattering of a dry mix comprising wood fibres, a thermosetting resin, and

wear resistant particles on a core;

2) applying an organic solvent on the mix on the core;

3) spraying an impregnation fluid composition comprising dispersed photocatalytic nanoparticles; and

4) applying heat and pressure.

10. The method as claimed in claim 9, wherein the thermosetting resin is a polymer resin.

11. The method as claimed in claim 9 or 10, wherein the polymer resin is a melamine formaldehyde resin.

12. The method as claimed in any one of claims 9 to 11, wherein the photocatalytic nanoparticles are dispersed in water.

13. The method as claimed in any one of claims 9 to 12, wherein the organic solvent comprises ketone, and/or alcohol, and/or acetate.

14. The method as claimed in claim 13, wherein the ketone is selected from the group consisting of acetone and methyl ethyl ketone.

15. The method as claimed in claim 13, wherein the alcohol is selected from the group consisting of ethanol, propanol, and methanol.

16. The method as claimed in claim 13, wherein the acetate is selected from the group consisting of butyl acetate and ethyl acetate.

17. The method as claimed in any one of claims 9 to 13 or 15 wherein the organic solvent is ethanol.

18. The method as claimed in any one of the claims 9 to 17 wherein the method comprises the step of applying a fluid with a wetting agent on the mix.

19. The method as claimed in claim 18, wherein the fluid with a wetting agent is applied on the mix before step 2).

20. The method as claimed in claim 18 or 19, wherein the wetting agent is in the form of water containing 1% weight content of wetting agent.

21. The method as claimed in any one of claims 18 to 20 wherein the method comprises the step of applying the fluid with the wetting agent and the organic solvent together.

22. The method as claimed in any one of the claims 9 to 21 wherein the method comprises the step of applying the impregnation fluid and the organic solvent together.

23. The method as claimed in any one of the preceding claims wherein said photocatalytic nanoparticles have a crystallinity of at least 50 %.

24. The method as claimed in any one of the preceding claims wherein said nanoparticles have a primary particle size of < 50 nm.

25. The method as claimed in claim 24, wherein the nanoparticles have a primary particle size of < 30 nm.

26. The method as claimed in claim 24, wherein the nanoparticles have a primary particle size of < 20 nm.

27. The method as claimed in claim 24, wherein the nanoparticles have a primary particle size of < 10 nm.

28. The method as claimed in any one of the preceding claims wherein the concentration of nanoparticles in said photocatalytic nanoparticle impregnation fluid is > 1 wt%.

29. The method as claimed in claim 28, wherein the concentration of nanoparticles in said photocatalytic nanoparticle impregnation fluid is > 5 wt%.

30. The method as claimed in claim 28, wherein the concentration of nanoparticles in said photocatalytic nanoparticle impregnation fluid is > 10 wt%.

31. The method as claimed in claim 28, wherein the concentration of nanoparticles in said photocatalytic nanoparticle impregnation fluid is > 15 wt%.

32. The method as claimed in claim 28, wherein the concentration of nanoparticles in said photocatalytic nanoparticle impregnation fluid is > 20 wt%.

33. The method as claimed in claim 28, wherein the concentration of nanoparticles in said photocatalytic nanoparticle impregnation fluid is > 25 wt%.

34. The method as claimed in any one of the preceding claims wherein the amount of impregnation fluid composition per square meter of the applied surface is in the range 1-200 ml/m^2.

35. The method as claimed in claim 34, wherein the amount of impregnation fluid composition per square meter of the applied surface is in the range of 5-100 ml/m^2.

36. The method as claimed in claim 34, wherein the amount of impregnation fluid composition per square meter of the applied surface is in the range of 10-50 ml/m^2.

37. The method as claimed in claim 34, wherein the amount of impregnation fluid composition per square meter of the applied surface is in the range of 20-40 ml/m^2.

38. A panel produced with the method as claimed in any one of the preceding claims wherein said photocatalytic nanoparticles are homogenously embedded in the uppermost layer of the panel.

39. The panel produced as claimed in claim 38, wherein said photocatalytic nanoparticles are homogenously embedded in the final panel at a thickness of > 0.1 µm; > 1 µm; > 10 µm; > 50 µm; > 100 µm; > 500 µm; > 1000 µm.

40. The method as claimed in claim 1 or claim 9, substantially as herein described, with reference to any one of the Examples and/or Figures thereof.

41. The method as claimed in any one of claims 1 to 37, substantially as herein described.

42. The panel as claimed in claim 38 or 39, substantially as herein described.