Claims

1. A tissue paper product, such as toilet paper or household towel, wherein

the tissue paper product comprises between two and four plies, including at least a first ply and a second ply, the two plies, three plies, or four plies being ply-bonded, optionally using an adhesive such as lamination glue or mechanical bonding, such as edge embossing, to form the tissue paper product, the first ply and the second ply being the outermost plies of the tissue paper product,

a grammage of the tissue paper product being in a range of 24 to 50 g/m^2 if a total number of plies of the tissue paper product is 2, in a range of 34 to 65 g/m^2 if a total number of plies of the tissue paper product is 3, and in a range of 55 to 95 g/m^2 if a total number of plies of the tissue paper product is 4, and wherein

the first ply is made of Conventional Wet Press (CWP) paper,

the second ply is a structured paper ply, such as a ply made of TAD, UCTAD, eTAD, Atmos, or NTT, and

the first ply has been embossed with a heated embossing roll.

2. The tissue paper product of claim 1, wherein the first ply comprises micro-embossments with a micro-embossment height in a range of 0.1 mm to 1.2 mm.

3. The tissue paper product of claim 1 or 2, wherein the first ply comprises macro-embossments with a macro-embossment height in a range of 0.2 mm to 2.0 mm, optionally 0.8 mm to 1.4 mm,

wherein, optionally, the macro-embossments cover between 1% and 20% of a total surface of the first ply, optionally between 2% and 10%, or between 3% and 6%.

4. The tissue paper product of any one of the preceding claims, wherein the first ply has been embossed with a heated first embossing roll heated to a temperature in the range of 80°C to 170°, optionally 100°C to 165°, 110°C to 165°, 120°C to 160°, or 130°C to 155°, and/or

wherein the second ply has been embossed with a non-heated embossing roll.

5. The tissue paper product of any one of the preceding claims, wherein the first ply has been moistened, prior to the step of embossing the first ply, with a liquid, such as water with or without one or several additives, with an amount of liquid being in the range of 2% to 12% of the basis weight of the first ply, or optionally 4% to 10% of the basis weight of the first ply.

6. The tissue paper product of any one of claims 1 to 4, wherein the first ply has not been moistened with a liquid prior to the step of embossing.

7. The tissue paper product of any one of the preceding claims, wherein the tissue paper product comprises exactly two plies, being the first ply and the second ply, wherein

the first ply comprises first embossments with a first height (h1), the first height (h1) being in a range of 0.2 mm to 2.0 mm,

the second ply comprises second embossments with a second height (h2), the second height (h2) being in a range of 0.2 mm to 2.0 mm,

the first ply optionally comprises third embossments with a third height (h3) smaller than the first height (h1) (h1>h3); and

the second ply optionally comprises fourth embossments with a fourth height (h4) smaller than the second height (h2) (h2>h4);

wherein, optionally, the adhesive, such as lamination glue, is optionally applied to tips of the first embossments of the first ply and/or to tips of the second embossments of the second ply.

8. The tissue paper product of any one of the claims 1 to 6, wherein the tissue paper product comprises exactly three plies, being the first ply and the second ply and a third ply, located between the first ply and the second ply, the third ply optionally being made of Conventional Wet Press (CWP) paper, wherein

the first ply comprises first embossments with a first height (h1), the first height (h1) being in a range of 0.2 mm to 2.0 mm,

the adhesive, such as lamination glue, is optionally applied to the third ply at parts bonded to tips of the first embossments of the first ply and/or to tips of the second embossments of the second ply, and/or wherein the adhesive , such as lamination glue, is optionally applied to tips of the first embossments of the first ply and/or to tips of the second embossments of the second ply,

the second ply comprises second embossments with a second height (h2), the second height (h2) being in a range of 0.2 mm to 2.0 mm,

the first ply optionally comprises third embossments with a third height (h3) smaller than the first height (h1) (h1>h3).

9. The tissue paper product of claim 8, wherein the third ply has not been embossed prior to ply-bonding, wherein the third ply optionally, is only partially embossed at locations where it is ply-bonded with the first ply and the second ply.

10. The tissue paper product of claim 8, wherein the first ply and the third ply have been embossed together to

form the first embossments on the first ply and the third ply,

and, optionally, the first ply and the third ply have been embossed together to form also the third embossments on the first ply and the third ply.

11. The tissue paper product of any one of the claims 1 to 6, wherein the tissue paper product comprises exactly four plies, being the first ply and the second ply, and a third ply and a fourth ply located between the first ply and the second ply, the third ply and the fourth ply optionally being made of Conventional Wet Press (CWP) paper, wherein

the first ply comprises first embossments with a first height (h1), the first height (h1) being in a range of 0.2 mm to 2.0 mm,

the adhesive, such as lamination glue, is optionally applied to the third ply at parts bonded to tips of the first embossments of the first ply,

the second ply comprises second embossments with a second height (h2), the second height (h2) being in a range of 0.2 mm to 2.0 mm, and

the first ply optionally comprises third embossments with a third height (h3) smaller than the first height (h1) (h1>h3).

12. The tissue paper product of claim 11, wherein the first ply and the third ply have been embossed together to form the first embossments on the first ply and the third ply, wherein

the fourth ply has not been embossed prior to ply-bonding or has been embossed separately from the first ply and the third ply, and

the third embossments have optionally been formed only on the first ply but not on the third ply, or wherein the first ply and the third ply have been optionally embossed together to form the third

embossments on the first ply and the third ply.

13. The tissue paper product of claim 11, wherein the first ply, the third ply, and the fourth ply have been embossed together to form the first embossments on the first ply, the third ply, and the fourth ply, and,

optionally, the first ply, the third ply, and the fourth ply have been embossed together to form the third embossments on the first ply, the third ply, and the fourth ply, or,

optionally, the third embossments have been formed on the first ply and the third ply, but not on the fourth ply, or,

optionally, the third embossments have been formed on the first ply, but not on the third ply and the fourth ply.

14. The tissue paper product of claim 11, wherein the third ply and the fourth ply have been embossed together separately from the first ply, or

wherein the third ply and the fourth ply are unembossed.

15. The tissue paper product of any one of the preceding claims, wherein the first embossments are provided on an area constituting between 1% and 20% of a total surface of the first ply, and/or a density of the third embossments is in a range of 25 to 120 embossments/cm^2, optionally 40 to 100 embossments/cm^2, or 50 to 80 embossments/cm^2.

16. The tissue paper product of any one of the preceding claims, wherein the grammage of each of the plies is in a range of 13 to 30 g/m^2, optionally 16 to 28 g/m^2, or 18 to 24 g/m^2.

17. A tissue paper product, such as toilet paper or

household towel, wherein

the tissue paper product comprises between two and four plies, including at least a first ply and a second ply, the two plies, three plies, or four plies being ply-bonded, optionally using an adhesive such as lamination glue or mechanical bonding, such as edge embossing, to form the tissue paper product, the first ply and the second ply being the outermost plies of the tissue paper product,

a grammage of each of the plies being in a range of 13 to 30 g/m^2, optionally 16 to 28 g/m^2, or 18 to 24 g/m^2, and wherein

the first ply is made of Conventional Wet Press (CWP) paper ,

the second ply is a structured paper ply, such as a ply made of TAD, UCTAD, eTAD, Atmos, or NTT, and

the first ply has been embossed with a heated embossing roll.

18. A roll of tissue paper product made of a spirally wound continuous web of the tissue paper product of any one of the preceding claims, the tissue paper product having a first end and a second end, the web of tissue paper product being wound such as to define an axially extending inner hole centrally positioned relative to the roll and such that the first end is located on the outer side of the roll and the second end is located at the inner hole.

19. The roll of tissue paper product of claim 18, wherein a diameter of the roll is in a range of from 85 to 200 mm.

20. A stack of unfolded sheets or of folded sheets, optionally of interfolded sheets, made of the tissue paper product of any one of claims 1 to 17.

21. A method of manufacturing a tissue paper product, such

as toilet paper or household towel, comprising between two and four plies, comprising the steps of:

- feeding between two and four plies, including at least a first ply made of Conventional Wet Press (CWP) paper and a second ply being a structured paper ply, such as a ply made of TAD, UCTAD, eTAD, Atmos, or NTT, with each ply having a grammage in a range of 13 to 30 g/m^2, optionally 16 to 28 g/m^2, or 18 to 24 g/m^2;
- embossing the first ply on a first embossing roll with first embossing protrusions with a first height (h1) to form first embossments on the first ply,
- embossing the second ply on a second embossing roll with second embossing protrusions with a second height (h2) to form second embossments on the second ply,
- ply-bonding the two plies, three plies, or four plies ply, optionally using an adhesive, such as a lamination glue, or mechanical bonding, such as edge embossing, to form the tissue paper product;

wherein the step of embossing the first ply is performed using a heated first embossing roll.

22. The method of manufacturing a tissue paper product of claim 21, wherein the heated first embossing roll is heated to a temperature in the range of 80°C to 170°, optionally 100°C to 165°, 110°C to 165°, 120°C to 160°, or 130°C to 155°, from the inside or outside by a heating means, the heating means optionally comprising heat carrying fluid and/or relying on induction and/or infrared heating, and/or

wherein the step of embossing the second ply is performed using a non-heated second embossing roll.

23. The method of manufacturing a tissue paper product of claim 21 or 22, wherein the first ply is moistened with a liquid, such as water with or without one or several additives, with an amount of liquid being in the range of 2% to 12% of the basis weight of the first ply, or

optionally 4% to 10% of the basis weight of the first ply, prior to the step of embossing the first ply.

24. The method of manufacturing a tissue paper product of claim 21 or 22, wherein the first ply is not moistened with a liquid prior to the step of embossing the first ply.

25. The method of manufacturing a tissue paper product of any one of the claims 21 to 23, the tissue paper product comprising exactly two plies and having a grammage in a range of 24 to 50 g/m^2, the method comprising the steps of:

embossing the first ply with the heated first embossing roll with the first embossing protrusions to form the first embossments with a first height (h1) in a range of 0.2 mm to 2.0 mm;

embossing the second ply with the second embossing roll with the second embossing protrusions to form the second embossments with a second height (h2) in a range of 0.2 mm to 2.0 mm;

wherein, optionally, the first embossing roll also comprises third embossing protrusions and the step of embossing the first ply forms the first and third embossments on the first ply, the third embossments having a third height (h3) smaller than the first height h1 (h1>h3),

or, wherein, optionally, the method comprises a step of embossing the first ply with a third embossing roll with third embossing protrusions to form third embossments on the first ply, the third embossments having a third height (h3) smaller than the first height h1 (h1>h3).

26. The method of manufacturing a tissue paper product of any one of the claims 21 to 23, the tissue paper product comprising exactly three plies and having a grammage in

a range of 34 to 65 g/m^2, being the first ply and the second ply and a third ply, located between the first ply and the second ply, the third ply optionally being made of Conventional Wet Press (CWP) paper, the method comprising the steps of:

embossing the first ply with the heated first embossing roll with the first embossing protrusions to form the first embossments with a first height (h1) in a range of 0.2 mm to 2.0 mm;

embossing the second ply with the second embossing roll with the second embossing protrusions to form the second embossments with a second height (h2) in a range of 0.2 mm to 2.0 mm;

wherein, optionally, the first embossing roll also comprises third embossing protrusions and the step of embossing the first ply forms the first and third embossments on the first ply, the third embossments having a third height (h3) smaller than the first height (h1) (h1>h3),

or, wherein, optionally, the method comprises a step of embossing the first ply with a third embossing roll with third embossing protrusions to the third embossments on the first ply, the third embossments having a third height (h3) smaller than the first height (h1) (h1>h3).

27. The method of manufacturing a tissue paper product of claim 26, wherein the method does not comprise a step of embossing the third ply.

28. The method of manufacturing a tissue paper product of claim 26, wherein the method comprises a step of embossing the first ply and the third ply together to form the first embossments on the first ply and the third ply, and

wherein, optionally, the first ply and the third ply are embossed together to form also the third

embossments on the first ply and the third ply.

29. The method of manufacturing a tissue paper product of any one of the claims 21 to 23, the tissue paper product comprising exactly four plies and having a grammage in a range of 55 to 95 g/m^2, being the first ply and the second ply, as well as a third ply and a fourth ply located between the first ply and the second ply, the third ply and the fourth ply optionally being made of Conventional Wet Press (CWP) paper, the method comprising the steps of:

embossing the first ply with the heated first embossing roll with the first embossing protrusions to form the first embossments with a first height (h1) in a range of 0.2 mm to 2.0 mm;

embossing the second ply with the second embossing roll with the second embossing protrusions to form the second embossments with a second height (h2) in a range of 0.2 mm to 2.0 mm;

wherein, optionally, the first embossing roll also comprises third embossing protrusions and the step of embossing the first ply forms the first and third embossments on the first ply, the third embossments having a third height (h3) smaller than the first height (h1) (h1>h3),

or, wherein, optionally, the method comprises a step of embossing the first ply with a third embossing roll with third embossing protrusions to form third embossments on the first ply, the third embossments having a third height (h3) smaller than the first height (h1) (h1>h3).

30. The method of manufacturing a tissue paper product of claim 29, wherein the first ply and the third ply are embossed together to form the first embossments on the first ply and the third ply,

wherein the method does not comprise a step of

embossing the fourth ply or wherein the fourth ply is embossed separately from the first ply and the third ply, and

wherein the third embossments are optionally formed only on the first ply but not on the third ply, or wherein the first ply and the third ply are optionally embossed together to form the third embossments on the first ply and the third ply.

31. The method of manufacturing a tissue paper product of claim 29, wherein the first ply, the third ply, and the fourth ply are embossed together to form the first embossments on the first ply, the third ply, and the fourth ply, and

wherein, optionally, the first ply, the third ply, and the fourth ply are embossed together to form the third embossments on the first ply, the third ply, and the fourth ply, or

wherein, optionally, the third embossments are formed on the first ply and the third ply, but not on the fourth ply, or

wherein, optionally, the third embossments are formed on the first ply, but not on the third ply and the fourth ply.

32. The method of manufacturing a tissue paper product of claim 29, wherein the third ply and the fourth ply are embossed together separately from the first ply, or

wherein the method does not comprise a step of embossing the third ply and does not comprise a step of embossing the fourth ply.

33. The method of manufacturing a tissue paper product of claim 29,

wherein the first embossments are formed on an area of the first ply constituting between 1% and 20% of a total surface of the first ply, and/or the third

embossments are formed with a density in a range of 25 to 120 embossments/cm^2, optionally 40 to 100 embossments/cm^2, or 50 to 80 embossments/cm^2.

34. The method of manufacturing a tissue paper product of any one of the claims 21 to 33, wherein an embossing load during the embossing of the first ply reaches a range of from to 1 to 50 kg/cml, or optionally 5 to 40 kg/cml.