Claims

1. A coreless roll of a tissue paper product, such as toilet paper, made of a spirally wound continuous web of 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 coreless roll and such that the first end is located on the outer side of the coreless roll and the second end is located at the inner hole,

wherein the tissue paper product comprises two plies, being a first ply and a second ply, the first ply and the second ply being ply-bonded, optionally using an adhesive such as lamination glue and/or mechanical bonding, such as edge embossing, to form the tissue paper product, and

a grammage of the tissue paper product being in a range of 24 to 50 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, the coreless roll has an outer diameter in the range of 95 to 150 mm, a diameter of the inner hole is in the range of 20 to 50 mm, and a density of the coreless roll is in a range of 80 to 150 kg/m^3, and

a caliper ratio of the roll is in a range of 30% to 80%,

the caliper ratio $(c_s-c_t)/c_t$ being obtained by dividing a difference between a standard caliper c_s of the tissue paper product as defined by the standard ISO-12625-3:2014 and a theoretical caliper c_t of the tissue paper product by the theoretical caliper c_t, and

the theoretical caliper c_t being defined as a ratio between a grammage of the tissue paper product and the

density of the roll,

wherein the tissue paper product has a caliper of at least 0.35 mm.

2. The coreless roll of a tissue paper product of claim 1, wherein the tissue paper product has a caliper of at least 0.40 mm, or at least 0.45 mm.

3. The coreless roll of a tissue paper product of claim 1 or 2, the two plies being a first ply and a 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,

wherein 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,

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, and

wherein the first ply optionally comprises third embossments with a third height (h3) smaller than the first height (h1) (h1>h3), the third height (h3) being in a range of 0.1 mm to 1.2 mm.

4. The coreless roll of a tissue paper product of claim 3,

wherein the first embossments have been formed by the heated embossing roll and, optionally, the third embossments have been formed by the heated embossing roll,

and/or wherein the second embossments have been formed by a second heated embossing roll,

and/or wherein the third embossments have been formed by a third heated embossing roll,

and/or wherein, optionally, the first ply has been moistened, prior to having been embossed, with an amount of liquid, such as water, 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, wherein the liquid optionally is provided with one or several additives, or wherein the first ply has not been moistened with a liquid prior to having been embossed.

5. The coreless roll of a tissue paper product of any one of the preceding claims, wherein a geometrical mean tensile strength of tissue paper product of the coreless roll lies in a range of 70 N/m to 210 N/m, optionally 90 N/m to 210 N/m, or 110 N/m to 210 N/m.

6. A coreless roll of a tissue paper product, such as toilet paper, made of a spirally wound continuous web of 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 coreless roll and such that the first end is located on the outer side of the coreless roll and the second end is located at the inner hole,

wherein the tissue paper product comprises three plies, the three plies being a first ply, a second ply, and a third ply, wherein the first ply is one of the outermost plies of the tissue paper product, and the three plies are ply-bonded, optionally using an adhesive such as lamination glue and/or mechanical bonding, such as edge embossing, to form the tissue paper product, and

wherein the grammage of the tissue paper product is in a range of 34 g/m^2 to 65 g/m^2, optionally 40 g/m^2 to 63 g/m^2, or 45 g/m^2 to 60 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,

the coreless roll has an outer diameter in the range of 95 to 150 mm, a diameter of the inner hole is in the

range of 20 to 50 mm, and a density of the coreless roll is in a range of 90 to 150 kg/m^3, and

a caliper ratio of the roll is in a range of 20% to 60%,

the caliper ratio $(c_S\text{-}c_t)/c_t$ being obtained by dividing a difference between a standard caliper c_S of the tissue paper product as defined by the standard ISO-12625-3:2014 and a theoretical caliper c_t of the tissue paper product by the theoretical caliper c_t, and

the theoretical caliper c_t being defined as a ratio between a grammage of the tissue paper product and the density of the roll,

wherein the tissue paper product has a caliper of at least 0.40 mm.

7. The coreless roll of a tissue paper product of claim 6, wherein the tissue paper product has a caliper of at least 0.45 mm, or at least 0.50 mm.

8. The coreless roll of a tissue paper product of claim 6 or 7,

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,

wherein 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,

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

wherein the first ply optionally comprises third embossments with a third height (h3) smaller than the first height (h1) (h1>h3), the third height (h3) being in a range of 0.1 mm to 1.2 mm.

9. The coreless roll of a tissue paper product of claim 8,

wherein the third ply has not been embossed prior to ply-bonding, wherein the third ply is, optionally, only partially embossed at locations where it is ply-bonded with the first ply or the second ply, and/or
the third ply is made of Conventional Wet Press (CWP) paper or the third ply is a structured paper ply, such as such as a ply made of TAD, UCTAD, eTAD, Atmos, or NTT.

10. The coreless roll of a tissue paper product of claim 8 or 9, 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

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

11. The coreless roll of a tissue paper product of claim 8, wherein the third ply comprises fourth embossments with a fourth height (h4), the fourth height (h4) being in a range of 0.2 mm to 2.0 mm, and wherein the third ply has been embossed separately from the first ply and the second ply,

wherein, optionally, the fourth embossments have been formed by a fourth heated embossing roll.

12. The coreless roll of a tissue paper product of any one of the claims 8 to 11,

wherein the first embossments have been formed by the heated embossing roll, and/or.

wherein the second embossments have been formed by a second heated embossing roll, and/or,

wherein the third embossments have been formed by the heated embossing roll or a third heated embossing roll, and/or

wherein, optionally, the first ply has been

moistened, prior to having been embossed, with an amount of liquid, such as water, 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, wherein the liquid optionally is provided with one or several additives, or wherein the first ply has not been moistened with a liquid prior to having been embossed.

13. The coreless roll of a tissue paper product of any one of claims 6 to 12, wherein a geometrical mean tensile strength of tissue paper product of the coreless roll lies in a range of 100 N/m to 280 N/m, optionally 120 N/m to 280 N/m, or 140 N/m to 280 N/m.

14. A coreless roll of a tissue paper product, such as toilet paper, made of a spirally wound continuous web of 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 coreless roll and such that the first end is located on the outer side of the coreless roll and the second end is located at the inner hole,

wherein the tissue paper product comprises four plies, the four plies being a first ply, a second ply, a third ply, and a fourth ply, wherein the first ply is one of the outermost plies of the tissue paper product, and the four plies are ply-bonded, optionally using an adhesive such as lamination glue and/or mechanical bonding, such as edge embossing, to form the tissue paper product, and

the grammage of the tissue paper product is in a range of 55 g/m^2 to 95 g/m^2, or optionally 60 g/m^2 to 80 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,

the coreless roll has an outer diameter in the range of 95 to 150 mm, a diameter of the inner hole is in the range of 20 to 50 mm, and a density of the coreless roll is in a range of 110 to 150 kg/m^3, and

a caliper ratio of the roll is in a range of 12% to 40%,

the caliper ratio $(c_S\text{-}c_t)/c_t$ being obtained by dividing a difference between a standard caliper c_S of the tissue paper product as defined by the standard ISO-12625-3:2014 and a theoretical caliper c_t of the tissue paper product by the theoretical caliper c_t, and

the theoretical caliper c_t being defined as a ratio between a grammage of the tissue paper product and the density of the roll,

wherein the tissue paper product has a caliper of at least 0.55 mm.

15. The coreless roll of a tissue paper product of claim 14, wherein the tissue paper product has a caliper of at least 0.60 mm, or at least 0.65 mm.

16. The coreless roll of a tissue paper product of claim 14 or 15,

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,

wherein 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,

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

wherein the first ply optionally comprises third embossments with a third height (h3) smaller than the

first height (h1) (h1>h3), the third height (h3) being in a range of 0.1 mm to 1.2 mm.

17. The coreless roll of a tissue paper product of claim 16, 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 is unembossed or has been embossed separately from the first ply, the second ply, and the third ply to form fourth embossments, the fourth embossments optionally having been embossed by a fourth heated embossing roll, and

wherein 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 embossed together to form the third embossments on the first ply and the third ply.

18. The coreless roll of a tissue paper product of claim 16, 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

wherein, 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

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

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

19. The coreless roll of a tissue paper product of claim 16, wherein the third ply and the fourth ply have been embossed together separately from the first ply and the second ply, or

wherein one of the third ply and the fourth ply has been separately embossed from the first ply and the second ply, and the other one of the third ply and the fourth ply is unembossed, or

wherein the third ply and the fourth ply are unembossed.

20. The coreless roll of a tissue paper product of claim 16, 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 and the second ply have been embossed together to form the second embossments on the fourth ply and the second ply, and

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

21. The coreless roll of a tissue paper product of any one of the claims 16 to 20,

wherein the first embossments have been formed by the heated embossing roll, and/or.

wherein the second embossments have been formed by a second heated embossing roll, and/or,

wherein the third embossments have been formed by the heated embossing roll or a third heated embossing roll, and/or,

wherein, optionally, the first ply has been moistened, prior to having been embossed, with an amount of liquid, such as water, 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, wherein the liquid optionally is provided with one or several additives, or wherein the first ply has not been moistened with a liquid prior to having been embossed.

22. The coreless roll of a tissue paper product of any one of claims 14 to 21, wherein a geometrical mean tensile strength of tissue paper product of the coreless roll lies in a range of 170 N/m to 370 N/m, optionally 200 N/m to 370 N/m, or 220 N/m to 370 N/m.

23. The coreless roll of a tissue paper product of any one of claims 14 to 22, wherein the third ply is made of Conventional Wet Press (CWP) paper and the fourth ply is made of Conventional Wet Press (CWP) paper; or
wherein the third ply is a structured paper ply, such as a ply made of TAD, UCTAD, eTAD, Atmos, or NTT, and the fourth ply is made of Conventional Wet Press (CWP) paper; or
wherein the third ply is made of Conventional Wet Press (CWP) paper and the fourth ply is a structured paper ply, such as a ply made of TAD, UCTAD, eTAD, Atmos, or NTT; or
wherein the third ply is a structured paper ply, such as a ply made of TAD, UCTAD, eTAD, Atmos, or NTT, and the fourth ply is a structured paper ply, such as a ply made of TAD, UCTAD, eTAD, Atmos, or NTT.

24. The coreless roll of a tissue paper product of any one of claims 3, 4, 8, 10, 12, 16-18, 20, and 21, wherein the first embossments cover between 1% and 20% of a total surface of the first ply, optionally between 2% and 10%, or between 3% and 6%, and/or
wherein 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.

25. The coreless roll of a tissue paper product of any one of the preceding claims, wherein the grammage of the first ply is in a range of 15 to 30 g/m^2, optionally 16 to 25 g/m^2, or 18 to 22 g/m^2, and/or wherein the grammage of the second ply is in a range of 12 to 30 g/m^2, optionally

14 to 25 g/m^2, or 15 to 23 g/m^2.

26. The coreless roll of a tissue paper product of any one of the preceding claims,

wherein the coreless roll has a radial compression strength of 20N or more, optionally of 25N or more, or of 30N or more.

27. A coreless roll of a tissue paper product, such as toilet paper, made of a spirally wound continuous web of 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 coreless roll and such that the first end is located on the outer side of the coreless roll and the second end is located at the inner hole,

wherein the tissue paper product comprises at least two plies, including at least a first ply and a second ply, the first ply being one of the outermost plies of the tissue paper product, wherein a total number of plies of the tissue paper product is between 2 and 4, the between 2 and 4 plies being ply-bonded, optionally using an adhesive such as lamination glue and/or mechanical bonding, such as edge embossing, to form the tissue paper product, and

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,

wherein the coreless roll has an outer diameter in the range of 95 to 150 mm, a diameter of the inner hole being in the range of 20 to 50 mm, and a density of the coreless roll being in a range of 80 to 150 kg/m^3, and

a caliper ratio of the roll is in a range of 30%-80% if the total number of plies is 2, the caliper ratio of

the roll is in a range of 20%-60% if the total number of plies is 3, and the caliper ratio of the roll is in a range of 12%-30% if the total number of plies is 4, the caliper ratio $(c_s-c_t)/c_t$ being obtained by dividing a difference between a standard caliper c_s of the tissue paper product as defined by the standard ISO-12625-3:2014 and a theoretical caliper c_t of the tissue paper product by the theoretical caliper c_t,

the theoretical caliper c_t being defined as a ratio between a grammage of the tissue paper product and the density of the roll,

wherein the coreless roll has a radial compression strength of 20N or more, optionally of 25N or more, or of 30N or more,

wherein the tissue paper product has a caliper of at least 0.35 mm.

28. The coreless roll of a tissue paper product of any one of the preceding claims, wherein at least a part of an innermost circumvolution, optionally the entire innermost circumvolution, of the absorbent material of the coreless roll at the second end comprises a stabilizing coating composition.

29. A method of manufacturing a coreless roll of a tissue paper product, such as toilet paper, the tissue paper product being made of two plies, the method comprising the steps of:

- providing a first ply of Conventional Wet Press paper (CWP) and a second ply, the second ply being a structured paper ply, such as a ply made of TAD, UCTAD, eTAD, Atmos, or NTT;
- embossing the first ply with a heated embossing roll;
- ply-bonding the two plies, optionally with an adhesive, such as a lamination glue, and/or with mechanical bonding, such as edge embossing, to form a tissue paper product with a grammage in a range of 24

g/m^2 to 50 g/m^2, and a caliper ratio in a range of 30% to 80%;

- spirally winding up the tissue paper product on a mandrel to form a coreless roll and to define an axially extending inner hole facing the mandrel, with a first end of the tissue paper product being located on the outer side of the coreless roll and the second end being located at the inner hole; and
- withdrawing the mandrel;

wherein the coreless roll comprises an outer diameter in the range of 95 to 150 mm and a diameter of the inner hole is in the range of 20 to 50 mm, and the density of the coreless roll lies in a range of 80 to 150 kg/m^3,

a caliper of the formed tissue paper product optionally being at least 0.35 mm, or at least 0.40 mm, or at least 0.45 mm.

30. The method of manufacturing a coreless roll of a tissue paper product of claim 29, the method comprising the steps of:

- embossing the first ply with the heated embossing roll with first embossing protrusions to form first embossments with a first height (h1) in a range of 0.2 mm to 2.0 mm;
- embossing the second ply with a second embossing roll with second embossing protrusions to form second embossments with a second height (h2) in a range of 0.2 mm to 2.0 mm; and
- wherein, optionally, the heated embossing roll also comprises third embossing protrusions and the step of embossing the first ply forms first and third embossments on the third ply, the third embossing embossments having a height (h3) in range of 0.1 mm to 1.2 mm,

or, wherein the method optionally comprises a step of embossing the first ply with a third embossing roll with third embossing protrusions to form third

embossments, the third embossing protrusions having a height (h3) in range of 0.1 mm to 1.2 mm.

31. A method of manufacturing a coreless roll of a tissue paper product, such as toilet paper, the tissue paper product being made of three plies, the method comprising the steps of:

- providing three plies, being a first ply, a second, ply, and a third ply, the first ply being a ply made of Conventional Wet Press (CWP) paper, the second ply being a structured paper ply, such as a ply made of TAD, UCTAD, eTAD, Atmos, or NTT,;
- embossing the first ply with a heated embossing roll;
- ply-bonding the three plies, optionally with an adhesive, such as a lamination glue, and/or with mechanical bonding, such as edge embossing, to form a tissue paper product with the first ply being one of the outermost plies, and with a grammage in a range of 34 g/m^2 to 65 g/m^2, optionally 40 g/m^2 to 63 g/m^2, or 45 g/m^2 to 60 g/m^2 and a caliper ratio in a range of 20% to 60%;
- spirally winding up the tissue paper product on a mandrel to form a coreless roll and to define an axially extending inner hole facing the mandrel, with a first end of the tissue paper product being located on the outer side of the coreless roll and the second end being located at the inner hole; and
- withdrawing the mandrel;

wherein the coreless roll comprises an outer diameter in the range of 95 to 150 mm and a diameter of the inner hole is in the range of 20 to 50 mm, and the density of the coreless roll lies in a range of 90 to 150 kg/m^3,

a caliper of the formed tissue paper product optionally being at least 0.40 mm, optionally at least 0.45 mm, or at least 0.50 mm.

32. The method of manufacturing a coreless roll of a tissue paper product of claim 31, the method comprising the steps of:

- embossing the first ply with the heated embossing roll with first embossing protrusions to form first embossments with a first height (h1) in a range of 0.2 mm to 2.0 mm;
- embossing the second ply with a second embossing roll with second embossing protrusions to form second embossments with a second height (h2) in a range of 0.2 mm to 2.0 mm;
- wherein the first, second, and third plies are ply-bonded; and
- wherein, optionally, the heated embossing roll also comprises third embossing protrusions and the step of embossing the first ply forms first and third embossments on the third ply, the third embossing protrusions having a height (h3) in range of 0.1 mm to 1.2 mm, or

wherein the method optionally comprises a step of embossing the first ply with a third embossing roll with third embossing protrusions to form third embossments, the third embossing protrusions having a height (h3) in range of 0.1 mm to 1.2 mm.

33. The method of manufacturing a coreless roll of a tissue paper product of claim 32, wherein the third ply is not embossed.

34. The method of manufacturing a coreless roll of a tissue paper product of claim 32, wherein the first ply and third ply are embossed together using the heated embossing roll to form the first embossments on the first ply and the third ply,

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 embossed together to form the third embossments on the first ply and the third

ply.

35. The method of manufacturing a coreless roll of a tissue paper product of claim 32, the method comprising a step of forming fourth embossments with a fourth height (h4) on the third ply with a fourth embossing roll, the fourth height (h4) being in a range of 0.2 mm to 2.0 mm, and wherein the third ply is embossed separately from the first ply and the second ply,

wherein, optionally, the fourth embossments are formed by a fourth heated embossing roll.

36. The method of manufacturing a coreless roll of a tissue paper product of any one of the claims 31 to 35,

wherein the second embossments are formed by a second heated embossing roll, and/or,

wherein the third embossments are formed by the heated embossing roll or a third heated embossing roll.

37. A method of manufacturing a coreless roll of a tissue paper product, such as toilet paper, the tissue paper product being made of four plies, the method comprising the steps of:

- providing four plies, the four plies being a first ply, a second ply, a third ply, and a fourth ply, the first ply being a ply made of Conventional Wet Press (CWP) paper, the second ply being a structured paper ply, such as a ply made of TAD, UCTAD, eTAD, Atmos, or NTT;
- embossing the first ply with a heated embossing roll;
- ply-bonding the four plies, optionally with an adhesive, such as a lamination glue, and/or with mechanical bonding, such as edge embossing, to form a tissue paper product with a grammage in a range of 55 g/m^2 to 95 g/m^2, or optionally 60 g/m^2 to 80 g/m^2, and a caliper ratio in a range of 12% to 40%;
- spirally winding up the tissue paper product on a

mandrel to form a coreless roll and to define an axially extending inner hole facing the mandrel, with a first end of the tissue paper product being located on the outer side of the coreless roll and the second end being located at the inner hole; and

- withdrawing the mandrel;

wherein the coreless roll comprises an outer diameter in the range of 95 to 150 mm and a diameter of the inner hole is in the range of 20 to 50 mm, and the density of the coreless roll lies in a range of 110 to 150 kg/m^3,

a caliper of the formed tissue paper product optionally being at least 0.55 mm, or at least 0.60 mm, or at least 0.65 mm.

38. The method of manufacturing a coreless roll of a tissue paper product of claim 37, the method comprising the steps of:

- embossing the first ply with the heated embossing roll with first embossing protrusions to form first embossments with a first height (h1) in a range of 0.2 mm to 2.0 mm;
- embossing the second ply with a second embossing roll with second embossing protrusions to form second embossments with a second height (h2) in a range of 0.2 mm to 2.0 mm; and
- wherein, optionally, the heated embossing roll optionally also comprises third embossing protrusions and the step of embossing the first ply forms first and third embossments on the third ply, the third embossing protrusions having a height (h3) in range of 0.1 mm to 1.2 mm, or

wherein the method optionally comprises a step of embossing the first ply with a third embossing roll with third embossing protrusions to form third embossments, the third embossing protrusions having a height (h3) in range of 0.1 mm to 1.2 mm.

39. The method of manufacturing a coreless roll of a tissue paper product of claim 38, the method comprising the step of embossing the first ply and third ply together using the heated embossing roll to form the first embossments on the first ply and the third ply,

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.

40. The method of manufacturing a coreless roll of a tissue paper product of claim 38,

wherein the first ply and the third ply are embossed together using the heated embossing roll to form the first embossments on the first ply and the third ply,

wherein the fourth ply is unembossed or embossed separately from the first ply, the third ply, and the second 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.

41. The method of manufacturing a coreless roll of a tissue paper product of claim 38,

wherein the first ply, the third ply, and the fourth ply are embossed together using the heated embossing roll 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 optionally formed on the first ply, but not on the third ply and the fourth ply.

42. The method of manufacturing a coreless roll of a tissue paper product of claim 38,

wherein the third ply and the fourth ply are embossed together separately from the first ply and the second ply, or

wherein one of the third ply and the fourth ply is separately embossed from the first ply and the second ply, and the method does not comprise a step of embossing the other one of the third ply and the fourth 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.

43. The method of manufacturing a coreless roll of a tissue paper product of claim 38,

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 fourth ply and the second ply are embossed together to form the second embossments on the fourth ply and the second ply, and

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

44. The method of manufacturing a coreless roll of a tissue paper product of claim 38,

wherein the second embossments are formed by a second heated embossing roll, and/or,

wherein the third embossments are formed by the heated embossing roll or a third heated embossing roll.

45. The method of manufacturing a coreless roll of a tissue paper product of a tissue paper product of any one of claims 30, 32, 34, 38, 39-41, and 43,

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.

46. The method of manufacturing a coreless roll of a tissue paper product of any one of the claims 29 to 45,

wherein the method comprises the step of coating at least a part of an innermost circumvolution, optionally the entire innermost circumvolution, of the tissue paper product of the coreless roll at the second end with a stabilizing coating composition.

47. The method of manufacturing a coreless roll of a tissue paper product of any one of the claims 29 to 46, wherein the heated 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.

48. The method of manufacturing a coreless roll of a tissue paper product of any one of the claims 29 to 47, 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.

49. The method of manufacturing a coreless roll of a tissue paper product of any one of the claims 29 to 48, wherein the first ply is not moistened with a liquid prior to the step of embossing the first ply.

50. The method of manufacturing a coreless roll of a tissue paper product of any one of the claims 29 to 49, 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.