Claims

1. Tissue product with at least four plies made of tissue paper base sheet or nonwoven, comprising:
   - a first outer ply (4) and a second outer ply (2) and at least two inner plies (17, 18) between the first outer ply (4) and the second outer ply (2), wherein
   - only one of the inner plies (18) is un-embossed;
   - at least one of the outer plies (4) comprises a décor embossing pattern; and
   - at least two adjacent inner plies comprise the un-embossed inner ply (18) and one micro-embossed inner ply (17); wherein

   the outer plies (2, 4) comprise a micro-embossing pattern, wherein either the density of the micro-embossed protrusions (19) of the micro-embossed inner ply (17) is different to the density of embossed protrusions of the micro-embossing pattern of the outer ply which is adjacent to the micro-embossed inner ply (17) or the micro-embossed protrusions (19) of the micro-embossed inner ply (17) and the embossed protrusions of the adjacent outer ply are not in register with one another.

2. Tissue product according to claim 1, wherein at least one of the embossed plies comprises a double layer or plural layers.

3. Tissue product according to any of the preceding claims, wherein
   - a considerable portion of the outwardly facing main surface of the first outer ply (4) is provided with a soft region (22) surrounded by a décor embossing region (24);
   - the soft region (22) is provided with first micro-embossed protrusions (23); and

- the décor embossing region (24) comprises first embossed décor protrusions (9); wherein
- the first micro-embossed protrusions (23) are essentially not adhesively bonded to an inner ply adjacent to the first outer ply (4).

4. Tissue product according to any of the preceding claims, characterized in that the density of the embossed protrusions of the micro-embossing pattern of the inner ply (17) is different to the density of the protrusions of a second micro-embossing pattern of the second outer ply (2), preferably smaller than the density of the protrusions of the second micro-embossing pattern of the second outer ply (2).

5. Tissue product according to claim 3, characterized in that the first micro-embossed protrusions (23) of the first outer ply (4) and/or the embossed protrusions of the micro-embossing pattern of the micro-embossed inner ply (17) and/or the protrusions of a second micro-embossing pattern of the second outer ply are arranged in a density from 30 to 200 dots/cm^2.

6. Tissue product according to claim 4 or 5, wherein a middle ply (17) adjacent to first outer ply (4) is provided with a décor embossing region with further embossed décor protrusions which are in register with the first embossed décor protrusions.

7. Tissue product according to any of the preceding claims, wherein the un-embossed inner ply (18) is adjacent to the first outer ply (4) or second outer ply (2).

8. Tissue product according to any of the preceding claims, wherein at least three inner plies are provided and

- a first inner ply (17) not adjacent to the first outer ply (4) or second outer ply (2) is provided with a micro-embossing pattern; and
- a second inner ply (18) between the first inner ply (17) and either the first outer ply (4) or second outer ply (2) is un-embossed.

9. Tissue product according to claim 8 or 9, wherein the micro-embossing pattern of the first inner ply (17) extends essentially all over the surface of the first inner ply (17).

10. Tissue product according to claim 3 or 5, wherein less than 0.5% of the first micro-embossed protrusions (23) are adhesively bonded to an inner ply adjacent to the first outer ply (4).

11. Tissue product according to any of the claims 3, 5 or 10, wherein the soft region (22) surrounded by the décor embossing region (24) covers between 25% and 90%, preferably between 30% and 80%, more preferably between 35% and 50%, and most preferably around 45% of the outwardly facing main surface of the first outer ply (4).

12. Tissue product according to any of the preceding claims, the tissue product either comprising a stack of individual sheets or a roll with transversely extending weakening lines to subdivide the web into individual sheets.

13. Tissue product according to claim 12, wherein the embossing is in register with the dimensions of the individual sheets of the tissue product.

14. Tissue product according to any of the preceding claims, characterized in that the application of glue is restricted to an overall surface fraction of less than 12%, preferably less than 2.5% of the tissue product.

15. Tissue product according to any of the claims 3, 5, 10 or 11, characterized in that the soft region (22) has an overall oval shape.

16. Tissue product according to any of the preceding claims, characterized in that the décor embossing region (24) of the first outer ply (4) further comprises second embossed décor protrusions (28) with a smaller height than the height of the first embossed décor protrusions (9).

~~17. Device for manufacturing a tissue product according to any of the preceding claims, comprising:~~

- ~~a first engraved roll (S1) running against a first anvil roll (32), wherein the first engraved roll (S1) is designed to emboss the first outer ply (4);~~
- ~~a glue application device (36) adjacent to the first engraved roll S1), and~~
- ~~a marrying roll (M1) cooperating with the first engraved roll (S1);~~
- ~~a second engraved roll (S2) running against a second anvil roll (38), wherein the second engraved roll (S2) is arranged and designed to emboss the second outer ply (2);~~
- ~~a third engraved roll (S3) running against a third anvil roll (34), wherein the third engraved roll (S3) is arranged to emboss one of the inner plies (17); wherein~~
- ~~the device further comprises means to direct at least one un-embossed inner ply (18) towards the first engraved roll (S1) downstream of the nip~~

between the first engraved roll (S1) and the first anvil roll (32);

wherein there is a gap between the first engraved roll (S1) and the second engraved roll (S2).

18. Device according to claim 17, wherein the first engraved roll (S1) has a repeating pattern of embossing protrusions with décor embossing regions surrounding regions provided with micro-embossing protrusions.

19. Device according to claim 17 or 18, further comprising an additional embossing roll and an cooperating anvil roll for embossing one of the inner plies.

20. Device according to any of the claims 17 to 19, further comprising a perforating device to generate transversely extending weakening lines to subdivide the web into individual sheets.

21. Device according to any of the claims 17 to 20, further comprising a stacking device to form stacks of individual sheets of the tissue product.

22. Device according to any of the claims 17 to 20, further comprising a winding device to form rolls of the perforated or un-perforated tissue product.

23. Method for manufacturing a tissue product according to one of the claims 1 to 16 comprising the steps:

(a) directing a first outer ply (4) into the nip between a first engraved roll (S1) running against a first anvil roll (32);

(b) directing an inner ply into the nip between a third engraved roll (S3) running against a third anvil roll (34) to form an embossed inner ply (17);

(c) feeding the embossed inner ply (17) and an un-embossed inner ply (18) towards the first engraved roll (S1) downstream of the first anvil roll (32), wherein either the un-embossed inner ply (18) or the embossed inner ply (17) comes into contact with the embossed first outer ply (4);

(d) directing a second outer ply into the nip between a second engraved roll (S2) running against a second anvil roll (38) to form an embossed bottom ply (2);

(e) feeding the embossed second outer ply (2) towards the first engraved roll (S1) and into the gap between the first engraved roll (S1) and the second engraved roll (S2) upstream of the marrying roll (M1); and

(f) joining the plies in the nip between the first engraved roll and the marrying roll.

24. Method according to claim 23, wherein an un-embossed ply (18) is brought in direct contact with the embossed first outer ply (4) or second outer ply (2).

25. Method according to claim 23 or 24, further comprising the additional step of directing a second inner ply into the nip between a fourth roll running against a fourth anvil roll.

26. Method according to any of the claims 23 to 25, wherein in step (a) either two first outer plies or two second outer plies are embossed together.

27. Method according to any of the claims 23 to 26, wherein in step (a) and/or step (d) the outer ply is embossed in two separate steps which is a first pre-embossing step to provide the micro-embossing pattern followed by a second décor embossing step to provide the décor embossing.