What is claimed is:

1. A shipping optimization process for absorbent articles having a substantially airfelt free absorbent core, characterized in that it comprises the steps of:

   (a) identifying an optimized diaper;

   (b) identifying an optimized bag for holding two or more optimized diapers;

   (c) identifying an optimized box for holding two or more optimized bags;

   (d) identifying an optimized pallet and arranging the optimized boxes thereon; and

   (e) identifying an optimized load plan for a vehicle and arranging the optimized pallets therein;

   wherein the vehicle has a calculated Load Factor of from 0.7 to 1.0 when the vehicle is loaded with the optimized pallets.

2. The process according to Claim 1, characterized in that the step of identifying an optimized diaper includes: a design inputs phase comprising gathering data regarding one or more items selected from the group consisting of consumer needs, business needs, habits and practices, and market research; and a design objective phase comprising inputting the data collected from the design inputs phase and determining a basic design for the diaper, and modifying and engineering the basic design considering additional factors, such factors comprising one or more item selected from the group consisting of raw material costs, raw material availability, sizes and size dimensions, performance requirements, design aesthetics, and manufacturing capabilities.

3. The process according to Claim 1, characterized in that the step of identifying an optimized bag includes: a diaper parameters phase comprising gathering data regarding one or more items selected from the group consisting of folded diaper dimensions, diaper weight, pad count, in-bag compression, diaper compressibility, and transfer compression; and a bag inputs phase comprising inputting the data collected from the diaper parameters phase and determining the materials, physical characteristics, and dimensions of the optimized bag considering additional factors, such factors comprising one or more

items selected from the group consisting of bag stretch, pad orientation, whether to include a wicket slit, stack height, whether to include a window type if any, stack number, stack orientation, handle type if any, and bag side bulge.

4. The process according to Claim 1, characterized in that the step of identifying an optimized box includes: a bag parameters phase comprising gathering data regarding one or more items selected from the group consisting of bag dimensions, filled bag weight, bag compressibility, and pad compression; and a box inputs phase comprising inputting the data collected from the bag parameters phase and determining the design of the optimized box considering additional factors, such factors comprising one or more items selected from the group consisting of flat bag circumference, bag width, front to back bag distance, height of bag, stretch of loaded bag, percent compression at transfer, bag orientation, stacked bag count, bag side bulge, vertical edge radius, film gauge, in-box compression, in-box height, and maximum bag number/orientation.

5. The process according to Claim 1, characterized in that the step of identifying an optimized pallet includes: a box parameters phase comprising gathering data regarding one or more items selected from the group consisting of container type, type and location of glue flaps, length and width of glue flaps, number of colors on the container, type of printing, and container handles; and a pallet inputs phase comprising inputting the data collected from the box parameters phase and determining the unit load design of the optimized pallet considering additional factors, such factors comprising one or more items selected from the group consisting of pallet dimensions, over-hang specifications, cases per layer, mixed pallet requirement, under-hang specifications, pallet pattern selection, and layers per pallet.

6. The process according to Claim 1, characterized in that the step of identifying an optimized vehicle includes: a pallet parameters phase comprising gathering data regarding one or more items selected from the group consisting of pallet load weight, pallet load volume, and pallet load volume utilization; and a trailer inputs phase

comprising inputting the data collected from the pallet parameters phase and determining the load plan of the optimized vehicle considering additional factors, such factors comprising one or more items selected from the group consisting of trailer height, trailer length, trailer width, and staggered load requirements.

7. The process according to any one of the preceding claims, characterized in that the vehicle has a calculated Load Factor of from 0.75 to 1.0 when the vehicle is loaded with the optimized pallets, preferably from 0.81 to 0.95.

8. The process according to any one of the preceding claims, characterized in that the optimized diaper has an In-Bag Stack Height of less than or equal to 80 mm, preferably from 72 mm to 80 mm.

9. The process according to any one of the preceding claims, characterized in that the optimized diaper has an In-Bag Compression of greater than or equal to 58%, preferably from 58% to 62%.

10. The The process according to any one of the preceding claims, characterized in that the optimized diaper has a longitudinal bending stiffness of less than or equal to 355 N/m, preferably from 285 N/m to 355 N/m.

11. The process according to any one of the preceding claims, characterized in that the optimized diaper has a bag utilization factor of less than or equal to 0.030 m^2/pad/m, preferably from 0.027 m^2/pad/m to 0.030 m^2/pad/m.

12. A pallet of absorbent products characterized in that it comprises:

a plurality of packages each having a plurality of disposable absorbent articles disposed within the interior space of the package, each of the disposable absorbent articles having

a topsheet; a backsheet; a substantially cellulose free absorbent core located between the topsheet and the backsheet; a first waist region; a second waist region; a crotch region extending longitudinally between the first and second waist regions; and a fastening member extending laterally outward from the second waist region and adapted to releasably connect with a landing zone located in the first waist region;

wherein the absorbent products arranged on the pallet exhibit a calculated Load Factor of less than or equal to 1.0, preferably from 0.7 to 1.0.

13. A shipping vehicle of absorbent products characterized in that it comprises:

a transportation area for receiving items to be transported, the vehicle having a maximum weight capacity for transporting items and a maximum volume capacity for transporting items; and

a plurality of packages each having a plurality of disposable absorbent articles disposed within the interior space of the package, each of the disposable absorbent articles having a topsheet; a backsheet; a substantially cellulose free absorbent core located between the topsheet and the backsheet; a first waist region; a second waist region; a crotch region extending longitudinally between the first and second waist regions; and a fastening member extending laterally outward from the second waist region and adapted to releasably connect with a landing zone located in the first waist region;

wherein the vehicle exhibits a calculated Load Factor of from 0.7 to 1.0, preferably from 0.75 to 1.0.

CLAIMS

1. A shipping optimization process for absorbent articles comprising the steps of:

(a) identifying a semi-trailer in which the absorbent articles are to be shipped;

(b) obtaining a legal semi-trailer weight limit of the semi-trailer (W_1);

(c) estimating a weight of the semi-trailer load to be shipped (W_2);

(d) obtaining a volume capacity of the semi-trailer (V_1);

(e) estimating a volume of the semi-trailer load to be shipped (V_2);

(f) using the following formula to calculate a Load Factor of the semi-trailer:

$$\text{Load Factor}=(W_2/W_1)/(V_2/V_1);$$ and

(g) loading the semi-trailer with absorbent articles such that the Load Factor of the semi-trailer calculated in step (f) is achieved;

wherein the absorbent articles have a substantially airfelt free absorbent core.

2. The process according to claim 1, further comprising the step of adjusting W_1, V_1, or both, until the Load Factor is from about 0.7 to about 1.0.

3. The process according to claim 2, wherein W_1, V_1, or both, are adjusted until the Load Factor is from about 0.75 to about 1.0.

4. The process according to claim 3, wherein W_1, V_1, or both, are adjusted until the Load Factor is from about 0.81 to about 0.95.

5. The process according to claim 1, wherein the absorbent articles are packaged in a plurality of packages such that the absorbent articles have an In-Bag Stack Height of less than or equal to about 80 mm.

6. The process according to claim 1, wherein the absorbent articles are packaged in a plurality of packages such that the absorbent articles have an In-Bag Stack Height from about 72 mm to about 80 mm.

7. The process according to claim 1, wherein the absorbent articles are packaged in a plurality of packages such that the absorbent articles have an In-Bag Compression of greater than or equal to about 58%.

8. The process according to claim 1, wherein the absorbent articles are packaged in a plurality of packages such that the absorbent articles have an In-Bag Compression from about 58% to about 62%.

9. The process according to claim 1, wherein the absorbent articles are packaged in a plurality of packages such that the absorbent articles have a longitudinal bending stiffness of less than or equal to about 355 N/m.

10. The process according to claim 1, wherein the absorbent articles are packaged in a plurality of packages such that the absorbent articles have a longitudinal bending stiffness from about 285 N/m to about 355 N/m.

11. The process according to claim 1, wherein the absorbent articles are packaged in a plurality of packages such that the absorbent articles have a bag utilization factor of less than or equal to about 0.030 m^2/pad/m.

12. The process according to claim 1, wherein the absorbent articles are packaged in a plurality of packages such that the absorbent articles have a bag utilization factor from about 0.027 m^2/pad/m to about 0.030 m^2/pad/m.

13. The process according to claim 1, wherein the absorbent articles are placed on pallets prior to being loaded into the semi-trailer.

14. The process according to claim 1, wherein the absorbent articles are selected from the group consisting of diapers, training pants, and adult incontinence undergarments.

15. The process according to claim 14, wherein the absorbent articles are diapers.

16. A shipping optimization process for absorbent articles comprising the steps of:

(a) identifying a plurality of pallets on which the absorbent articles are to be shipped;

(b) identifying a semi-trailer in which the pallets are to be shipped;

(c) obtaining a legal semi-trailer weight limit of the semi-trailer (W_1);

(d) estimating a weight of the semi-trailer load to be shipped (W_2);

(e) obtaining a volume capacity of the semi-trailer (V_1);

f) estimating a volume of the semi-trailer load to be shipped (V_2);

(g) using the following formula to calculate a Load Factor of the semi-trailer:

$$\text{Load Factor}=(W_2/W_1)/(V_2/V_1);$$ and

(h) loading the plurality of pallets with absorbent articles such that the Load Factor of the semi-trailer calculated in step (g) is achieved;

(i) loading the plurality of pallets into the semi-trailer;

wherein the absorbent articles have a substantially airfelt free absorbent core.

17. The process according to claim 16, further comprising the step of adjusting W_1, V_1, or both, until the Load Factor is from about 0.7 to about 1.0.

18. The process according to claim 17, wherein W_1, V_1, or both, are adjusted until the Load Factor is from about 0.75 to about 1.0.

19. The process according to claim 18, wherein W_1, V_1, or both, are adjusted until the Load Factor is from about 0.81 to about 0.95.

20. The process according to claim 16, wherein the absorbent articles are selected from the group consisting of diapers, training pants, and adult incontinence undergarments.

21. The process according to claim 20, wherein the absorbent articles are diapers.