SHELF READY PACKAGE HAVING STRUCTURAL INTEGRITY, AND PROCESS FOR MAKING THEM

A shelf ready package (1) and method of manufacturing a shelf ready package, including an outer case (1a) and a strengthening element (1b).
FIELD OF THE INVENTION

[0001] Stackable outer case package for transporting and displaying articles contained therein.

BACKGROUND OF THE INVENTION

[0002] Outer cases, such as cartons, made from cardboard, paperboard, or similar materials are well known and used for transporting and storing various types of articles, including retail articles and the like. Shelf ready packages are a means for packaging a plurality of articles in outer cases in a manner that they can be displayed, for instance on a supermarket shelf or aisle, directly from the outer case without first having to remove the articles from the outer case. The individual articles, contained within the shelf ready package, can be individual packets, cans, bottles, bags, boxes, and the like. Typically, the shelf ready package comprises an at least partially removable element, formed by a line of weakness in the outer case, which can be easily detached. Once the at least partially removable element has been detached, the articles contained within are displayed to the customer, and the customer is able to pick up the displayed article.

[0003] Store owners are constantly looking for additional ways to reduce costs for stacking articles, while ensuring that the article remains presentable to the potential customer. Shelf ready packages avoids the time consuming effort associated with removing articles from the outer case and placing on shelves.

[0004] Shelf ready packages typically suffer from conflicting targets: on the one hand, outer cases need to provide a strong resistance to protect the pack content during shipment and handling, whilst on the other hand; the shelf ready package case should be easy open in store. For today's standard shelf ready packages, either the case is quick and easy to open, or the case has very good resistance to pressure and impact. As such, a choice has to be made for the one or the other depending on the need of the user. The challenge of easy opening and robustness is more pronounced in the rough handling context, such as during manual stacking, or where automatic warehousing systems are used. Current shelf ready packages tend to be not compatible within such rough handling conditions, with increased risk of damage to both the shelf ready package and the product contained therein.

[0005] Hence, a need remains for a shelf ready package with improved structural integrity to provide a better resistance to damage during shipment while also being easy to open in store.

[0006] WO 201096741 discloses a carton comprising carton walls and a compression resistant structure disposed adjacent to an inside face of at least one of the carton walls. US 2007/0063005 discloses a carton formed from a multi-ply carton blank. The carton blank comprises a primary blank and one or more reinforcing blanks overlaying the primary blank. WO 2012/119198 discloses a carton having a lid, the carton includes a carton base and a detachable lid connected to the base along a line of weakness.

SUMMARY OF THE INVENTION

[0007] The present invention relates to a shelf ready package comprising at least a first blank and a second blank, the first blank is formed into an outer case and the second blank is formed into a strengthening element, wherein the outer case comprises a non-removable element and an at least partially removable element, formed by a first line of weakness, such that the at least partially removable element can be at least partially or fully removed along the first line of weakness, wherein the strengthening element is inside the outer case, wherein the strengthening element is positioned against at least one wall of the outer case so as to cover at least a part of the first line of weakness, wherein the strengthening element comprises a second line of weakness and wherein the second line of weakness follows along at least a part of the first line of weakness covered by the strengthening element.

[0008] The present invention further relates to a process of making the shelf ready package according to the present invention.

[0009] The present invention further relates to the use of a perforated strengthening element to improve the box compression strength (BCT) of a perforated outer case.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is a perspective view of a shelf ready package (1) with a strengthening element (1b) inside the outer case (1a). The outer case (1a) comprising a front wall (2), a back wall (5) opposing said front wall (2), two opposing side walls (3) and (4), upper portions (62), (63), (64) and (65) which collectively form a top wall (6) and lower portions
(71), (72), (73) and (74) which collectively form a bottom wall (7), wherein the outer case (1a) comprises a non-removable element (31) and an at least partially removable element (30), formed by a first line of weakness (40). The strengthening element (1b) comprises a second line of weakness (44) and two faces (50)(51) each facing one of the walls of the outer case (1a).

FIG. 2 is a perspective view of the outer case (1a) of FIG. 1, comprising a non-removable element (31) and an at least partially removable element (30), formed by a first line of weakness (40). The at least partially removable element (30) comprises a front face (32), top face (36), and one side face (33). The outer case also comprises grasping members (38) defined by third lines of weakness (39).

FIG. 2a shows an enlarged view of the outer case (1a) of FIG. 2, comprising a first line of weakness (40) formed by perforation components (41) and landed components (42).

FIG. 3 is a view of a first blank (60), which can be used to make an outer case (1a) of the present invention. The first blank (60) has two side walls (3)(4), a front wall (2) and a back wall (5). Each of the front wall (2), two side walls (3)(4), and back wall (5) contain upper portions (62), (63), (64) and (65) respectively which collectively form the top wall and lower portions (71), (72), (73) and (74) respectively which collectively form the bottom wall. The first blank (60) includes an attachment seam (81).

FIG. 4 is a perspective view of the outer case (1a) of FIG. 2. The at least partially removable element (30) has been removed and the non-removable element (31) is remaining.

FIG. 5 is a view of a second blank (61), which can be used to make a strengthening element (1b) of the present invention, comprising a removable part (21) and a non-removable part (22) formed by a line of weakness (44). The strengthening element of FIG. 5 has two faces (50)(51) connected together by a spanning element (23).

FIG. 6 is a perspective view of the strengthening element (1b), comprising a removable part (21) and a non-removable part (22) formed by a line of weakness (44). The strengthening element of FIG. 6 has two faces (50)(51) connected together by a spanning element (23). The spanning element (23) is built by a series of scoring lines (26)(27).

FIG. 6a shows an enlarged view of the strengthening element (1b) comprising the spanning element (23) of FIG. 6.

FIG. 7 is a view of the assembly of the first blank (60) and the second blank (61) by positioning and optionally attaching the second blank (61) inside the first blank (60). The strengthening element (1b) is positioned against at least one wall of the outer case (1a) so as to cover at least a part of the first line of weakness (40). The second line of weakness (44) follows along at least a part of the first line of weakness (40) covered by the strengthening element (1b).

FIG. 8 is the same as FIG. 7 except that the second line of weakness (44) follows along the first of the outer case (1a) but with a small gap between the two lines of weakness (follows partly along).

FIG. 9 is a perspective view of a shelf ready package (1) with a strengthening element (1b) inside the outer case (1a). The strengthening element (1b) comprises a spanning element (23) built by a series of scoring lines (26)(27).

**DETAILED DESCRIPTION OF THE INVENTION**

The shelf ready package (1):

**[0011]** A shelf ready package (1) with sufficient structural integrity to provide a strong resistance to protect the pack content during shipment and handling while remaining easy to open in store, can be achieved by providing a shelf ready package (1) comprising at least a first blank (60) and a second blank (61), the first blank (60) is formed into an outer case (1a) and the second blank (61) is formed into a strengthening element (1b). The outer case (1a) comprises a non-removable element (31) and an at least partially removable element (30), formed by a first line of weakness (40), such that the at least partially removable element (30) can be at least partially or fully removed along the first line of weakness (40). The strengthening element (1b) is inside the outer case (1a) and is positioned against at least one wall of the outer case (1a) so as to cover at least a part of the first line of weakness (40), thus improving the integrity of the outer case...
(1a) and protecting the outer case (1a) from bursting open at the line of weakness during handling and transport. The strengthening element (1b) comprises a second line of weakness (44) and the second line of weakness (44) follows along at least a part of the first line of weakness (40) covered by the strengthening element (1b), thus enabling the shelf ready package (1a) to be easy to tear open since at least a part of the strengthening element (1b) will be detachable and therefore won’t block the access to the articles contained within the outer case (1a) and since the second line of weakness (44) follows along at least a part of the first line of weakness (40) both lines will still be easily broken by the user in one single motion.

Furthermore, the strengthening element (1b) can be formed into a strengthening pillar within the outer case (1a) thus providing a significant increase of the case box compression strength (as measured using the BCT method according to ISO 12048). The strengthening element (1b) can also ensure adequate structural integrity, even when a weaker outer case material is used. As such, the outer case material can be selected from but is not limited to micro-flute, solid board, E-flute (typically about 1.5 millimeters in thickness) or B-flute (typically about 3 millimeters in thickness). Other suitable materials for use as the outer case material can be selected from but not limited to C-flute (typically about 4 millimeters in thickness) or EB-flute (typically about 4.5 millimeters in thickness).

The shelf ready package (1) of the present invention comprises at least a first blank (60) and a second blank (61), the first blank (60) is formed into an outer case (1a) and the second blank (61) is formed into a strengthening element (1b), wherein the outer case (1a) comprises a non-removable element (31) and an at least partially removable element (30), formed by a first line of weakness (40), such that the at least partially removable element (30) can be at least partially or fully removed along the first line of weakness (40), wherein the strengthening element (1b) is inside the outer case (1a), wherein the strengthening element (1b) comprises a second line of weakness (44), wherein the strengthening element (1b) is positioned against at least one wall of the outer case (1a) so as to cover at least a part of the first line of weakness (40) and wherein the second line of weakness (44) follows along at least a part of the first line of weakness (40) covered by the strengthening element (1b).

A shelf ready package (1) according to the present invention is shown in FIG. 1 and FIG. 9.

The dimensions of such shelf ready packages are typically between 50 and 400 millimeters in width and length and below 400 millimeters in height, but these dimensions can fluctuate depending on what article is meant to be contained within the shelf ready package (1). Any suitable article can be contained within the shelf ready package (1), including: fabric care products such as liquid laundry bottles, powdered laundry bags, fabric softeners, and the like; household cleaners, including dish washing agents, floor cleaners, and the like; personal care products such as moisturisers, cosmetics, shampoos, shaving products, and the like; diaper bags; perfumes; pet food; and combinations thereof.

Such shelf ready packages can be delivered to retail outlets, and the like, on a pallet comprising at least one layer of the shelf ready package (1). More preferably, such pallets comprise at least one, more preferably at least two layers of shelf ready packages (1). The improved strength of the shelf ready package (1) of the invention allows for a higher stacking height. The maximum number of layers of shelf ready packages (1) is typically between four and eight, more typically six, for instance, due to the size of delivery trucks.

The lines of weakness (40)(44):

The outer case (1a) comprises a non-removable element (31) and an at least partially removable element (30), formed by a first line of weakness (40). The at least partially removable element (30) can be removed or partially removed by separating the at least partially removable element (30) from the outer case (1a), along the first line of weakness (40). The first line of weakness (40) is preferably essentially continuous, such as forming a loop, so that the at least partially removable element (30) can be easily and fully removed by hand. However, the first line of weakness (40) can also be discontinuous, such that the at least partially removable element (30) remains partly attached. For instance, when the interior surface of the removable element comprises graphics, advertising, usage instructions, and combinations thereof. FIG. 2a is an enlarged view of area of FIG. 2, illustrating the continuous first line of weakness (40) comprising perforation components (41) and land components (42).

The dimensions of the perforation components (41) and land components (42) are defined to ensure protection of the articles prior to removing the at least partially removable element (30), while allowing easy and clean opening of the shelf ready package (1). The perforation components (41) of the continuous first line of weakness (40) are preferably 1.5 to 15 millimeters in length, more preferably 3 to 6 millimeters in length. The perforation component (41) preferably is comprised of a hole or slit which preferably penetrates the full thickness of the material forming the first blank (60). Alternatively, and in order to increase the force required to remove part or all of the removable element (30), part or all of the perforation components (41) can be oriented at an angle from the direction of the first line of weakness (40). Alternatively, or in addition, if a stronger first line of weakness (40) is desired, the perforation can penetrate part way
through the thickness of the material forming the carton blank. Alternatively, a stronger first line of weakness (40) can be provided by reducing the length of the perforation components (41), and correspondingly increasing the length of the land components (42). The land components (42) of the first line of weakness (40) are preferably from 1.5 to 4 millimeters in length, more preferably from 2.5 millimeters to 3.5 millimeters in length.

In addition, the first line of weakness (40) preferably has a minimum radius at points of directional change of at least 10 millimeters. Points of directional change, as used herein, do not include the corners of the container. The minimum radius aids in the ease and clean removal of the at least partially removable element (30) from the shelf ready package (1). The radius at points of directional change is preferably 20 to 50 millimeters. The at least partially removable element (30) of the outer case (1a) can be present on the front wall (2), side walls (3) and (4), top wall (6), and combinations thereof. The at least partially removable element (30) preferably comprises a front face (32), more preferably the at least partially removable element (30) comprises a front face (32) and top face (36). Even more preferably, the at least partially removable element (30) comprises a front face (32), top face (36), and at least one side face (33). The at least partially removable element (30) can consists of a front face (32), top face (36), and one side face (33), it provides a large opening to view and remove articles contained within the shelf ready package (1), once the at least partially removable element (30) has been removed, while also providing a corner, side wall (3) or (4), and back wall (5) to support other shelf ready packages that may have been placed on top of the shelf ready package (1).

[0017] The strengthening element (1b) comprises a second line of weakness (44). The first line of weakness (40) and the strengthening element (1b) are preferably from 2.5 millimeters to 3.5 millimeters in length.

[0018] The second line of weakness (44) follows along at least a part of the first line of weakness (40) covered by the strengthening element (1b). Thus, as the strengthening element (1b) is positioned against at least one wall of the outer case (1a) so as to cover a part of the first line of weakness (40), the second line of weakness (44) at least partly follows along the first line of weakness along this covered part.

[0019] By “follows along” it is meant that the second line of weakness (44) follows along the first line of weakness (40) such that it deviates from the first by no more than about 10 millimetres such that both lines can be easily broken by the user in one single motion. Therefore the two lines can follow each other exactly along (superimposed) or partly along (see FIG. 7 and 8).

[0020] The first line of weakness (40) and the second line of weakness (44) can be made using any known means, such as scoring; perforating; and combinations thereof. The lines of weakness can be a single line, or a series of lines, such as those that make up a tear strip configuration. Preferably, the lines of weakness for the outer case (40) or the strengthening element (44) are a perforated line as illustrated in the Figures.

[0021] Scoring can be achieved by applying suitable pressure onto a knife or sharp element which is placed on the carton blank or formed carton. A perforated line of weakness can be formed using any suitable means, such as punch pins (typically in the form of dots or slits), a cutting disc, or a laser.

Outer case (1a):

[0022] The shelf ready package (1) comprises a first blank (60) formed into an outer case (1a).

[0023] The outer case (1a) may comprise:

a) a front wall (2),

b) a back wall (5) opposing said front wall (2),

c) two opposing side walls (3) and (4),

d) upper portions (62), (63), (64) and (65) which collectively form a top wall (6),

e) lower portions (71), (72), (73) and (74) which collectively form a bottom wall (7)

[0024] The lower portions (71), (72), (73) and (74) are preferably formed into the bottom wall (7) using adhesive tape, gluing, and combinations thereof, though gluing is preferred.

[0025] The first blank (60) may comprise an attachment seam (81), in order to connect together the left-most part and right-most part of the first blank (60), for instance, by glueing.

[0026] The outer case (1a) can be made from any suitable material, such as paperboard, plastic, and combinations thereof. It can be corrugated or non-corrugated. It can vary in size, finish, strength, material, stiffness and print, delivering the required strength and decoration.
The shelf ready package (1) further comprises a second blank (61) formed into a strengthening element (1b). The strengthening element (1b) comprises a second line of weakness (44). The strengthening element (1b) is inside the outer case (1a). The strengthening element (1b) is positioned against at least one wall of the outer case (1a) so as to cover at least a part of the first line of weakness (40). The strengthening element (1b) improves the resistance of the part of the first line of weakness (40) covered from the inside thus protecting the outer case (1a) from bursting open at the line of weakness during handling and transport while enabling the perforated case to open easily.

The strengthening element (1b) comprises at least two faces (50)(51). Preferably, the strengthening element (1b) has two faces (50)(51). More preferably at least two faces (50)(51) of the strengthening element (1b) can be connected together by a spanning element (23). By face (50)(51) it is meant a part of the strengthening element (1b) facing one of the walls of the outer case (1a). Two faces (50)(51) can be connected together by for example at least one scoring line, a hinge, any kind of folding or preferably a spanning element (23).

The strengthening element (1b) can be made from any suitable material, such as paperboard, plastic, and combinations thereof. It can be corrugated or non-corrugated. It can vary in size, finish, strength, material, stiffness and print, delivering the required strength and decoration.

The strengthening element (1b) can be a layer of corrugate. A layer of corrugate is especially suitable to improve the vertical strength of the case. The strengthening element (1b) is a separate item to the outer case (1a) that is positioned and optionally attached to the inside of the outer case (1a).

By "attached" is meant bound by any common means of attachment such as adhesives.

The strengthening element (1b) can comprise a removable part (21) and a non-removable part (22) in the outer case (1a). The removable part (21) of the strengthening element (1b) if attached should only be attached to the at least partially removable element (30) of the outer case (1a). The non-removable part (22) of the strengthening element (1b), if attached, should only be attached to the non-removable element (31) of the outer case (1a).

The strengthening element (1b) can be attached to both the non-removable element (31) and the at least partially removable element (30) of the outer case (1a). As set out above, the removable part (21) of the strengthening element (1b) can be attached to the at least partially removable element (30) of the outer case (1a) and the non-removable part (22) of the strengthening element (1b) can be attached to the non-removable element (31) of the outer case (1a). Attaching provides a strengthening effect on the outer case (1a) integrity even after the perforated case has been opened since a non-removable part (22) of the strengthening element (1b) will remain in the outer case (1a).

The vertical ends of the strengthening element (1b) may be essentially straight and positioned essentially parallel to the outer case (1a) vertical edges, and maybe shaped for impact resistance optimization or best protective board material usage or a combination of both. The orientation of the protective boards’ corrugate flute (in case corrugate is used as protective board material) can be orientated vertically or horizontally, depending on in which direction maximum support for the outer case (1a) is desired. The strengthening element (1b) maybe structured and arranged such that the strengthening element (1b) does not prevent the blanks from folding and being manipulated to form the shelf ready package (1).

For a further benefit of easy folding, the strengthening element (1b) can be attached to only one wall of the outer case (1a). In case of folding, the strengthening element (1b) will thus be able to slide within the outer case (1a) allowing therefore the shelf ready package (1) to be easily folded flat. The strengthening element (1b) can further increase the overall outer case (1a) resistance against breaking and collapsing at pressure or impact by being formed into an extra strengthening pillar within the outer case (1a).

At least one section of the strengthening element (1b) may have a similar height as one of the wall of the outer case (1a) and fits within the perimeter of said wall of the outer case (1a) in order to deliver a vertical or horizontal strength on the case, depending on in which direction maximum support for the outer case (1a) is desired, preferably vertical strength. By "similar height" is meant a difference of height of less than about 5% between the above mentioned section of the strengthening element (1b) and said wall of the outer case (1a).

In order to deliver a vertical strength on the case, the strengthening element (1b) can be positioned against at least one of the wall of the outer case (1a), selected from the side walls (3) and (4), the front wall (2), the back wall (5) and combination thereof, preferably the strengthening element (1b) is positioned against the front wall and one side wall (3)(4).

The strengthening element (1b) can be positioned in a corner of the outer case (1a). The strengthening element can have a L-shape, such strengthening element comprises at least two faces (50)(51) connected together under an angle of 90 degrees.

The strengthening element (1b) can comprise a spanning element (23) (see FIG. 6 and 6a). The spanning element (23) can be built by a series of scoring lines (26)(27), at least two scoring lines under an angle of 30 to 60 degrees.
degrees, preferably about 45 degrees. The spanning element connects two faces (50)(51) of the strengthening element (1b) together and spans across a corner of the outer case (1a), therefore, unlike the L-shape structure, the strengthening element (1b) comprising a spanning element (23) allows an easy folding of the shelf ready package (1) by avoiding the strengthening element (1b) blocking the corner of the outer case (1a). Preferably, the strengthening element (1b) is positioned in a corner and comprises two faces (50)(51) connected together by a spanning element (23)

[0041] When the shelf ready package (1) comprises a strengthening element (1b) comprising a spanning element (23) attached to only one wall of the outer case (1b). It provides the further benefit of being easier to fold flat the shelf ready package (1) because the strengthening element (1b) will slide easily within the outer case (1a) and the strengthening element (1b) will not block the corner of the outer case (1a).

[0042] For a combination of the further benefits as set up above, the shelf ready package (1) can comprise a strengthening element (1b), wherein at least a section of the strengthening element (1b) has a similar height as one of the wall of the outer case (1a), wherein the strengthening element (1b) is positioned against the front wall (2) and one side wall (3)(4), in a corner of the outer case (1a), comprises two faces (50)(51) connected together by a spanning element (23) and is a layer of corrugate. For a further benefit, said strengthening element (1b) can be attached to only one wall of the outer case (1b).

Grasping members

[0043] Grasping members (38) can be optionally employed to aid in the removal of the at least partially removable element (30). Preferably, the present invention employs at least one grasping member (38) on at least two faces of the at least partially removable element (30). More preferably, the at least partially removable element (30) comprises a front face (32) and a top face (36), with both the front face (32) and the top face (36) comprising at least one grasping member (38), allowing separation of the at least partially removable element (30) to start either from the front face (32) or the top face (36). When used, such grasping members are positioned adjacent to the line of weakness (40). Thus, a person can engage the grasping members (38) and begin separation of the top face (36) of the at least partially removable element (30), when the at least partially removable element (30) is separated from the shelf ready package (1). Preferably, the grasping member (38) remains attached to the at least partially removable element (30), when the at least partially removable element (30) is separated from the shelf ready package (1).

[0044] The grasping member (38) can be defined by third lines of weakness (39). Each third line of weakness (39) may exhibit a uniform resistance to separation along its entire length, or alternatively vary in resistance to separation along its length. Preferably, each third line of weakness (39) varies in resistance to separation along its length, allowing each grasping member (38) to be only partially disassociated from the walls (that is, separated along a first region and rotatably displaced along one or more remaining regions of third line of weakness (39). This avoids separate disposal issues. The third lines of weakness (39) can be perforated lines, with optionally each line having a varying resistance to separation along its length by virtue of having land components and perforation components of varying dimensions. Preferably, these third lines of weakness (39) are weaker than the first line of weakness (40).

[0045] The grasping member (38) should be of sufficient size and geometry to readily receive at least one human finger, and preferably two fingers. Alternatively, various tools, such as a hook, could be inserted into the grasping member (38) for removing the at least partially removable element (30) from the shelf ready package (1).

Process of making:

[0046] The shelf ready package (1) can be formed using any suitable means, such as by hand and preferably on an automated packing line. Such processes can include the steps of:

(a) creating the first blank (60) of the outer case (1a) and the second blank (61) of the strengthening element;
(b) perforating the first blank (60) and the second blank (61) to create the first line of weakness (40) and the second line of weakness (44) respectively;
(c) assembling the first blank (60) and the second blank (61) together by positioning and optionally attaching the second blank (61) inside the first blank (60) in order to form a resulting blank (see FIG. 7 and 8);
(d) folding the resulting blank and attaching together the left-most part and right-most part of said resulting blank;
(e) bonding the front lower portion (72) and back lower portion (74) together, preferably using glue, tape, or combinations thereof, to form the bottom wall (7) (see FIG. 7);
(f) placing articles inside the outer case (1a);
(g) bonding the front upper portion (63) and back upper portion (65) together, preferably using glue, tape, and
combinations thereof, to form a upper wall (6).

[0048] The shelf ready package (1) is preferably assembled on an automated packing line. The carton blanks (60)(61) can be made from any suitable material, such as paperboard, plastic, and combinations thereof. The carton blanks (60)(61) can be corrugated or non-corrugated, preferably corrugated for a lightweight benefit. The carton blanks (60)(61) are typically made from paperboard, usually in roll-form. The paperboard is typically unwound for printing and the printed paperboard rerolled for later use, or immediately corrugated. Alternatively, printing can take place after corrugation.

[0049] Corrugation is typically achieved by running paperboard through corrugation wheels, to form a corrugated layer (often referred to as medium or fluting). A further two roll of paperboard is fed into the corrugators, either sequentially or simultaneously, and glued onto the corrugated layer to form the inner and outer layers of the single wall corrugated board. One or both of the inner and outer layers can be printed.

[0050] Alternatively, the corrugated board can have other structures, such as single face (one layer of liner and one layer of medium), double wall (3 layers of liners having 2 layers of mediums in between).

[0051] The corrugated board is typically cut into rectangular sheets (also called blanks), or can be directly cut into the required shape to form the carton blanks (60)(61). At the same time, or afterwards, the lines of weakness (40)(44) can be formed into the carton blanks (60)(61).

EXAMPLE

Benefit of the strengthening element on box compression strength (BCT)

[0052] Perforations are often used in corrugated outer cases to turn the cases into shelf ready packages (SRP). By including perforations, the outer case becomes weaker and its box compression strength (BCT) is reduced. The below comparative tests demonstrate that the loss in box compression strength can be compensated for by the insertion of a strengthening element to form a shelf ready package (1) according to the present invention.

[0053] The determination of the box compression strength (BCT) are made according to ISO 12048.

[0054] Three types of outer cases are tested for BCT: Outer case without perforation, outer case with perforation and outer case with perforation and comprising a strengthening element.

[0055] Two outer case of each type are tested. Every outer case is tested empty, using the following settings.

- Outer case dimension: LxWxH: 300x240x289mm
- Strengthening element folded dimension: LxWxH: 270x232x272mm
- Lab conditions: 23C/50%RH
- Tested on a Lloyd LR5K+ instrument
- Speed of compression: 12.5mm/min

[0056] The same board composition is used for the outer cases and strengthening element (C-flute: 535gsm). The test is repeated twice and the results averaged to provide the average box compression strength (Average BCT).

Table 1

<table>
<thead>
<tr>
<th>Case type</th>
<th>Board grade</th>
<th>Board grade insert</th>
<th>BCT (N)</th>
<th>Average BCT</th>
<th>Index</th>
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<td>C</td>
<td>/</td>
<td>2550,2</td>
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<td>100</td>
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<td></td>
<td></td>
<td></td>
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<td>/</td>
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<td>86</td>
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<td></td>
<td></td>
<td>2202,1</td>
<td></td>
<td></td>
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<tr>
<td>Outer case with perforation and comprising a strengthening element</td>
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[0057] As can be seen from the results in table 1, the perforations weaken the box compression strength (BCT) of the outer case but adding a strengthening element, to form a shelf ready package (1) according to the invention can not only compensate the loss in BCT caused by the perforations but also further significantly improve the BCT of the outer case.

[0058] The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact
numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as "40 mm" is intended to mean "about 40 mm".

Claims

1. A shelf ready package (1) comprising at least a first blank (60) and a second blank (61), the first blank (60) is formed into an outer case (1a) and the second blank (61) is formed into a strengthening element (1b), wherein the outer case (1a) comprises a non-removable element (31) and an at least partially removable element (30), formed by a first line of weakness (40), such that the at least partially removable element (30) can be at least partially or fully removed along the first line of weakness (40), wherein the strengthening element (1b) is inside the outer case (1a), wherein the strengthening element (1b) is positioned against at least one wall of the outer case (1a) so as to cover at least a part of the first line of weakness (40), wherein the strengthening element (1b) comprises a second line of weakness (44) and wherein the second line of weakness (44) follows along at least a part of the first line of weakness (40) covered by the strengthening element (1b).

2. A shelf ready package (1) according to claim 1, wherein the first blank (60) is formed into an outer case (1a) comprising:
   a) a front wall (2),
   b) a back wall (5) opposing said front wall (2),
   c) two opposing side walls (3) and (4),
   d) upper portions (62), (63), (64) and (65) which collectively form a top wall (6),
   e) lower portions (71), (72), (73) and (74) which collectively form a bottom wall (7).

3. A shelf ready package (1) according to any one of the preceding claims, wherein the strengthening element (1b) comprises at least two faces (50)(51).

4. A shelf ready package (1) according to any one of the preceding claims, wherein the strengthening element (1b) is attached to at least one wall of the outer case (1a).

5. A shelf ready package (1) according to any one of the preceding claims, wherein the strengthening element (1b) is attached to only one wall of the outer case (1a).

6. A shelf ready package (1) according to any one of the preceding claims, wherein at least a section of the strengthening element (1b) has a similar height as one of the wall of the outer case (1a).

7. A shelf ready package (1) according to any one of the preceding claims, wherein the strengthening element (1b) is positioned against at least one of the walls of the outer case (1a), selected from the side walls (3)(4), the front wall (2), the back wall (5) and combination thereof, preferably the strengthening element (1b) is positioned against the front wall (2) and one side wall (3)(4).

8. A shelf ready package (1) according to any one of the preceding claims, wherein the strengthening element (1b) is attached to the non-removable element (31) of the outer case (1a), the at least partially removable element (30) of the outer case (1a), or both the non-removable element (31) and the removable element (30).

9. A shelf ready package (1) according to any one of the preceding claims, wherein the strengthening element (1b) is positioned in a corner of the outer case (1a).

10. A shelf ready package (1) according to claim 8, wherein the strengthening element (1b) is positioned in a corner of the outer case (1a) and comprises two faces (50)(51) connected together by a spanning element (23).

11. A shelf ready package (1) according to any one of the preceding claims, wherein the strengthening element (1b) is structured and arranged such that the strengthening element (1b) does not prevent the first blank and the second blank from folding and being manipulated to form the shelf ready package (1).

12. A shelf ready package (1) according to any one of the preceding claims, wherein at least a section of the strengthening element (1b) has a similar height as one of the wall of the outer case (1a), wherein the strengthening element (1b)
is positioned against the front wall (2) and one side wall (3)(4), in a corner of the outer case (1a), comprises two faces (50)(51) connected together by a spanning element (23) and is a layer of corrugate.

13. A process for making the shelf ready package (1) according to claim 1, comprising the steps of:

(a) creating the first blank (60) of the outer case (1a) and the second blank (61) of the strengthening element;
(b) perforating the first blank (60) and the second blank (61) to create the first line of weakness (40) and the second line of weakness (44) respectively;
(c) assembling the first blank (60) and the second blank (61) together by positioning and optionally attaching the second blank (61) inside the first blank (60) in order to form a resulting blank.

14. A process for making a shelf ready package (1) according to claim 13, further comprising the steps of:

(d) folding the resulting blank and attaching together the left-most part and right-most part of said resulting blank;
(e) bonding the front lower portion (72) and back lower portion (74) together, preferably using glue, tape, or combinations thereof, to form the bottom wall (7);
(f) placing articles inside the outer case (1a);
(g) bonding the front upper portion (63) and back upper portion (65) together, preferably using glue, tape, and combinations thereof, to form a upper wall (6).

15. Use of a perforated strengthening element (1b) to improve the box compression strength (BCT) of a perforated outer case (1a).
# DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<th>Relevant to claim</th>
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**TECHNICAL FIELDS SEARCHED (IPC)**

- B65D

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The present search report has been drawn up for all claims.

**PLACE OF SEARCH**

Munich

**DATE OF COMPLETION OF THE SEARCH**

8 April 2016

**EXAMINER**

Czerny, M

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**CATEGORY OF CITED DOCUMENTS**

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REFERENCES CITED IN THE DESCRIPTION

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