

CARDBOARD SHEET FORMING A PROTECTIVE COVER

The present invention relates to the field of packaging for voluminous manufactured products, frequently
5 transported in the form of pallets or other transport units, of the type used in particular to protect stacks of panels or rolls of mineral wool (glass wool or rock wool) and packaged using well-known techniques that facilitate the transport and installation thereof.

10 Panels or rolls made of mineral wool are flexible and compressible and are frequently disposed in compacted stacks within suitable transport units. Reference may be made in particular to the publication WO2006/077347
15 for an example of such packaging.

As described in the application cited above, the materials made of mineral wool are kept in a compressed form while they are being transported so as to limit
20 costs, in particular by using plastic films, having appropriate mechanical elasticity properties, accompanied by straps disposed securely around the compacted stacks.

25 In order to avoid a situation in which the strap or the film damages the mineral wool units or slips, a protective piece of cardboard in the form of a cover is frequently disposed on top of the pallet, the dimensions of said cardboard being suitable to enclose
30 all of the top of the transport unit.

Even though it is made of a recyclable material, a piece of cardboard nevertheless has an environmental cost, as does the scrapping of the rest of the
35 packaging products contained in the transport unit.

It is an aim of the invention to reduce the environmental cost of such a transport unit, in particular by giving a second use to the packaging of

the product, in particular the above-described cardboard cover.

To this end, a first subject of the present invention
5 is a rectangular cardboard sheet configured to form a cover on a transport unit for transporting manufactured products, in particular disposed in said unit in the form of rolls or plates, said sheet having a rectangular bottom of length A and width B surrounded
10 by four cover flaps, namely an upper longitudinal flap, a lower longitudinal flap and two transverse flaps, said cardboard sheet **being characterized in that** it is furthermore configured to form, after it has been used as a cover, a container for scraps with a polygonal
15 section, preferably with a square or rectangular section, the cardboard sheet having to this end:

- a series of marks for transverse folding lines and a longitudinal folding line on the rectangular bottom, and
- 20 - marks for cutting lines extending transversely in line with the marks for the transverse folding lines and preferably in line with the longitudinal folding line.

According to the invention, said marks for cutting
25 lines that are disposed transversely indicate the position on said cardboard of the cutting lines for four flaps that form the bottom of said container after said cardboard has been folded as per said folding lines.

30 Preferably, according to the invention, said panels or rolls comprise or consist of mineral wool, in particular glass wool or rock wool.

35 According to particular embodiments, the cardboard sheet and/or the transport unit including said sheet comprise one or more of the following features, taken

individually or in any technically possible combination:

- 5 - The cardboard sheet furthermore comprises a second series of marks for folding lines delimiting the rectangular bottom and the longitudinal flaps and transverse flaps.
- 10 - The longitudinal flaps have a width of $(C-B)/2$, where C is the total width of the cardboard sheet, and the transverse flaps have a width of $(L-A)/2$,
15 where L is the total length of the cardboard sheet.
- The marks for the transverse folding lines are spaced apart by a distance $A/4$.
- The four bottom flaps have a width $A/8$ in a
15 transverse direction with respect to the cardboard.
- The upper longitudinal cover flap is configured to be folded towards the inside of the container and thus to double the upper edge of the container.
- 20 - Said upper longitudinal flap and the rectangular bottom have marks for cutting openings that form handles, the marks being configured to be
25 superposed after the upper longitudinal flap has been folded into the inside of the container and thus to reinforce said handles.
- The marks for cutting lines are extended along the lower longitudinal flap, in line with the marks for transverse folding lines.
- Following said cutting operation, each portion of
30 said lower longitudinal flap forms part of the bottom flaps of the container.
- The marks for cutting lines furthermore extend in
35 line with and on either side of the marks for the longitudinal folding line and transverse folding lines.
- One of the transverse cover flaps and the opposite portion of the rectangular bottom that is intended to face said transverse flap in said container

have cutting marks for cutting complementary retaining reliefs.

- The complementary retaining reliefs are a slot and a tab, the slot preferably being formed in said transverse cover flap.

A further subject of the invention is a method in which the above-described cardboard sheet is first of all used as a cover in a transport unit for transporting manufactured products and is then converted into a scrap container after said products have been unpacked.

According to preferred configurations of such a use method:

- The method comprises a first step of converting the cardboard sheet into a cover with four flaps and a subsequent step of converting the cover into a container for scraps with a polygonal section.
- The cover is used to cover a stack of objects to be protected before being strapped in a transport unit, the cover being converted into a scrap container after said unit has been unpacked.
- The object to be protected is a stack of panels or rolls of flexible material, for example panels or rolls of mineral wool.

A final subject of the invention is a transport unit for transporting manufactured products, grouped in the form of panels or rolls, in particular in the form of a package or pallet, comprising a cardboard sheet as described above, said cardboard sheet forming a cover for said pallet.

The invention will be understood better from reading the following description, given purely by way of example; the embodiment that will be described now should not be considered as limiting the scope of the present invention.

The description is given with reference to the appended drawings, in which:

- Figure 1 is a view illustrating a cardboard sheet according to the invention, before being folded and cut;

- Figures 2 to 6 are perspective views illustrating the operations necessary for converting the sheet in Figure 1 into a scrap container.

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As can be seen in Figure 1, the cardboard sheet is firstly intended to be used as a protective cover.

For this purpose, the cardboard sheet 1 has a first series of marks that indicate folding lines 7 and marks that indicate cutting lines 12, allowing the cardboard to be configured as a cover especially adapted to the dimensions of the transport unit of length A and width B.

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More specifically, the cardboard sheet, which has a total length L and a total width C, has a first series of printed folding marks 7, said marks 7 delimiting a rectangular bottom 2 of length A and width B and four cover flaps, namely an upper longitudinal flap 3, a lower longitudinal flap 9 and two transverse flaps 4. The longitudinal flaps 3, 9 have a width of $(C-B)/2$ and the transverse flaps 4 have a width of $(L-A)/2$.

30 The cardboard sheet furthermore has a first series of marks for cutting lines 12. These lines 12, which start at the corners of the rectangular bottom 2, provide each corner with two possibilities for cutting flaps so as to form the lid, the cutting lines forming with the edges of the cardboard sheet a square extension 6, two diagonally opposite corners of which form a corner of the cardboard sheet 1 and the corner corresponding to the rectangular bottom 2.

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The cardboard sheet furthermore has folding marks 7, in particular in the form of pre-printed marks on the cardboard, or pre-folds or pre-cuts (in the form of perforated dotted lines for example), that delimit an edge of the rectangular bottom 2. These folding marks 7 indicate the lines along which the cover flaps should be folded by the operator in order to obtain said cover. After folding, the square extension 6 of the flaps that is cut along a short side of the square is folded and stuck (using a glue or an adhesive) or alternatively stapled to the adjacent flap. As a variant, said squares can be cut out entirely and removed during the formation of the cover.

According to the invention, the same cardboard sheet that is usable first of all as a cover for the transport unit is also configured to be able to be converted into a scrap container after said first use.

To this end (that is to say for this second use), the cardboard sheet has specific series of folding marks 8 and cutting marks 13.

Within the meaning of the present invention, as already indicated above, any sign that is immediately visible to an operator as being a clear indication of the folding or cutting locations for converting the cardboard into a cover or container is denoted a "mark". These are for example ink imprints made directly on the cardboard sheet, or any other solution that falls within the scope of the above definition, such as pre-folds, pre-perforations, in particular in the form of dotted lines (perforated dotted lines), pre-piercing (the cardboard is not cut all the way through along the cutting/folding line), etc. Of course, different types of marks can be combined on the cardboard.

According to an advantageous embodiment of the invention, said immediately visible elements make it possible to differentiate between the different series of marks by the use for example of pictograms, colour codes, or different thicknesses or styles of lines or kinds of marking (ink, pre-fold, perforated dotted lines or pre-piercing, see above). Such marks can also be used to indicate and cut the handle orifices 11.

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More specifically, a second series of folding marks 8 is then visible within the above-described meaning (for example printed or alternatively incorporated where it is a question of pre-folding or pre-perforations/pre-piercing) according to the invention at the rectangular bottom 2.

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These marks are disposed on the rectangular bottom in the following disposition:

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- One longitudinal line 81 that is drawn at a distance equal to $A/8$ from the inner edge of the lower longitudinal flap 9, this line covering the entire length A of the rectangular bottom 2.

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- Three transverse lines 82 that are spaced apart by a distance $A/4$ along the length A of the rectangular bottom 2 and extend from the inner edge 22 of the upper longitudinal flap 3 to the above-described longitudinal line 81.

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The transverse lines 82 therefore divide said rectangular bottom 2 into four longitudinal portions 5 of equal area. These lines serve as a guide for folding the rectangular bottom 2 into four equal portions of width $A/4$, forming the faces of the scrap container as can be seen in Figure 3.

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Without departing from the scope of the invention, it is also conceivable for the transverse lines 82 not to be spaced apart by an identical distance $A/4$ but at a succession of spacings that are different but equal in pairs (that is to say a spacing between the successive lines of A/x then A/y then Ax then A/y , where x is different from y) in order to finally obtain this time a container with a rectangular base. Generally, although the configurations according to which the container has a square or rectangular base are preferred according to the invention, other polygonal sections of the container finally obtained are conceivable, without departing from the scope of the invention, depending on the number and spacing of the transverse lines 82.

The cardboard 1 also has a second series of cutting marks 13, different from the cutting lines 12 described above in connection with the formation of the cover. These marks extend transversely and longitudinally, respectively in line with and on either side of the above-described folding marks 81 and 82. They delimit in particular the bottom flaps 10 of the container, namely four bottom flaps 10 of length $A/4$.

Once folded, the four bottom flaps 10 form the bottom 41 of the container (see Figure 5).

The four bottom flaps 10 are advantageously of width $A/8$, such that they all have the same dimensions and adjoin in pairs.

The cardboard sheet furthermore has marks for cutting handles 11, for example in the form of perforated dotted lines, as indicated above.

Figures 2 to 6 illustrate the method for converting the cardboard 1 that has previously served as a cover for

the transport unit into a scrap container, in the form of a rectangular parallelepiped, the bottom of which is closed and square and the upper face of which is open.

5 After cutting along the lines 13, the upper longitudinal flap 3 of the cover is configured to be folded towards the inside of the container 40 and thus to double the upper edge 20 of the container (see Figures 2 to 6, in particular Figure 2). The upper edge
10 of the final container will then be reinforced, as will the handles 11 which will be cut out at the corresponding cutting marks, such that they are superposed after the flap 3 has been folded. This will make it possible to increase the robustness of the
15 scrap box while it is being transported by hand.

Similarly, the lower longitudinal flap 9 can be folded over itself in order to reinforce the bottom 41 of the container 40.

20 Alternatively, the latter can be cut along the lower edge 21 of the cover, following the folding line 7 of the inner edge of the lower longitudinal flap 9. This embodiment is the one shown in the appended Figures 2
25 to 6.

As a further alternative, according to another possible solution which may be preferred, the lower longitudinal flap 9 is laid out flat and after cutting, each portion
30 of said flap forms part of the bottom flaps 10. In such an embodiment, as alternatively indicated in Figure 1, the marks 81 are configured such that the width $A/8$ of the four bottom flaps 10 incorporates the width of the lower longitudinal flap 9.

35 Before the upper longitudinal flap 3 and optionally the lower longitudinal flap 9 are folded, a fold-forming tool can be applied to the marks for the folding lines

81 and 82 and a cutting tool can be applied to the lines of the cutting marks 13, in particular the climaver MM and MTR ® cutting tools sold by the company Climaver. One and the same tool especially provided to
5 this end can be used for the two functions, for example the blade of a cutter or knife, one edge of which is sharpened for cutting and the other is blunt in order to form folds.

10 The upper longitudinal fold 3 is folded as in Figure 2, after the folding tool has been applied along the folding marks 7 present on the inner edge 22.

After being cut along the cutting lines 13 (and after
15 the four bottom flaps 10 have been obtained), the cardboard sheet is then folded along the transverse folding marks 82, as illustrated by the arrows in Figure 3.

20 As can be seen in Figure 3 and more particularly in Figure 4, the cardboard sheet preferably has means for retaining by way of a tab 31 and slot 32 that are provided in one of the transverse cover flaps 4 and on the opposite longitudinal portion 5 of the container.
25 Cutting lines are thus advantageously provided in the cardboard sheet for cutting these retaining means 30 beforehand (or alternatively perforated dotted lines).

These retaining means are intended to facilitate the
30 phase of placing an adhesive strip 42 for sealing the bottom 41 by bringing the bottom flaps 10 into abutment during the folding of the cardboard. It is thus possible to avoid having to apply adhesive to the upper part of the container in order to hold the joint.

35 Alternatively, of course, the retaining means 31, 32 can, however, and if necessary, be reinforced by additional means for maintaining the mechanical

integrity of the container thus formed, such as an adhesive, a glue or staples.

5 Finally, an environmentally friendly container is
obtained, as per Figures 5 and 6, by giving a second
use to the packaging of the transport unit. The
container can in particular be advantageously used,
during the fitting of insulation materials present on
the pallet, as a container for storing waste mineral
10 wool and waste originating from the packaging itself
(cardboard boxes, plastics materials, adhesives, etc.).

CLAIMS

1. Rectangular cardboard sheet (1) configured to form
a cover on a transport unit for transporting
5 manufactured products, in particular disposed in said
unit in the form of rolls or plates, said sheet having
a rectangular bottom (2), of length A and width B,
surrounded by four cover flaps, namely an upper
longitudinal flap (3), a lower longitudinal flap (9)
10 and two transverse flaps (4), said cardboard sheet
being characterized in that it is furthermore
configured to form, after it has been used as a cover,
a container (40) for scraps with a polygonal section,
preferably with a square or rectangular section, the
15 cardboard sheet (1) having to this end:

- a series (8) of marks for transverse folding lines
(82) and a longitudinal folding line (81) on the
rectangular bottom (2), and
- marks for cutting lines (13) extending
20 transversely in line with the marks for the
transverse folding lines (82) and preferably in
line with the longitudinal folding line,
said marks for cutting lines (13) that are disposed
transversely indicating the position on said cardboard
25 of the cutting lines for four flaps (10) that form the
bottom (41) of said container (40) after said cardboard
(1) has been folded as per said folding lines (81, 82).

2. Cardboard sheet according to the preceding claim,
30 furthermore comprising a second series of marks for
folding lines (7) delimiting the rectangular bottom and
the longitudinal flaps (3, 9) and transverse flaps (4).

3. Cardboard sheet according to either of the
35 preceding claims, wherein the longitudinal flaps have a
width of $(C-B)/2$, where C is the total width of the
cardboard sheet, and wherein the transverse flaps have

a width of $(L-A)/2$, where L is the total length of the cardboard sheet.

4. Cardboard sheet according to one of the preceding
5 claims, wherein the marks for the transverse folding
lines (82) are spaced apart by a distance $A/4$.

5. Cardboard sheet according to the preceding claim,
wherein the four bottom flaps (10) have a width $A/8$ in
10 a transverse direction with respect to the cardboard.

6. Cardboard sheet according to one of the preceding
claims, wherein the upper longitudinal cover flap (3)
is configured to be folded towards the inside of the
15 container (40) and thus to double the upper edge (20)
of the container.

7. Cardboard sheet according to the preceding claim,
wherein said upper longitudinal flap (3) and the
20 rectangular bottom (2) have marks for cutting openings
(11) that form handles, the marks being configured to
be superposed after the upper longitudinal flap (3) has
been folded into the inside of the container (40) and
thus to reinforce said handles.

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8. Cardboard sheet according to any one of the
preceding claims, wherein the marks (13) for cutting
lines are extended along the lower longitudinal flap
(9), in line with the marks for transverse folding
30 lines (82).

9. Cardboard sheet according to the preceding claim,
wherein, following said cutting operation, each portion
of said lower longitudinal flap (9) forms part of the
35 bottom flaps (10) of the container.

10. Cardboard sheet according to one of the preceding
claims, wherein the marks for cutting lines (13)

furthermore extend in line with and on either side of the marks for the longitudinal folding line (81) and transverse folding lines (82).

5 11. Cardboard sheet according to any one of the preceding claims, wherein one of the transverse cover flaps (4) and the opposite portion of the rectangular bottom (2) that is intended to face said transverse flap in said container (40) have cutting marks for
10 cutting complementary retaining reliefs (31, 32).

12. Cardboard sheet according to the preceding claim, wherein the complementary retaining reliefs are a slot (32) and a tab (31), the slot preferably being formed
15 in said transverse cover flap (4).

13. Method for using a cardboard sheet according to any one of the preceding claims, comprising a first step of converting the cardboard sheet into a cover
20 with four flaps and a subsequent step of converting the cover into a container for scraps with a polygonal section.

14. Method according to the preceding claim, wherein
25 the cover is used to cover a stack of objects to be protected before being strapped in a transport unit, the cover being converted into a scrap container after said unit has been unpacked.

30 15. Method according to the preceding claim, wherein the object to be protected is a stack of panels or rolls of flexible material, for example panels or rolls of mineral wool.

35 16. Transport unit for transporting manufactured products, grouped in the form of panels or rolls, in particular in the form of a pallet, comprising a

cardboard sheet as described in one of Claims 1 to 12,
said cardboard sheet forming a cover for said pallet.