KENYA STANDARD **KS 2482:2013**
ICS .....

Packaging – Packaging products manufactured from corrugated or solid fibreboard - Types and construction

Public Review Draft 2013

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University Of Nairobi – Chemistry Dept
Kenya Industrial Research and training Institute
National Environment Management authority
East African Packaging Industries
Kenya flower council
Export promotion council
Consumer Information Network
Government Chemist
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In order to keep abreast of progress in industry, Kenya Standards shall be regularly reviewed. Suggestions for improvements to published standards, addressed to the Managing Director, Kenya Bureau of Standards, are welcome.

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Foreword

This standard has been prepared by the Technical Committee on packaging under the guidance of the Standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards.

Efficient packaging is of great importance for the distribution and the protection of goods. Insufficient or inappropriate packaging can lead to damage or wastage of the contents of the pack.

The purpose of this Kenya Standard is to describe construction elements for corrugated and solid fibreboard packagings by a simple code. Type, style and construction of a case or other packaging is described by a four figure code. It may be followed by extra digits, which will describe a manufacture's variation to a standard design.These extra digits may be specific to each manufacturer.The design of corrugated and solid fibreboard cases can be as variable as the types of articles to be packed but there are certain recognized basic type groups. The purpose of this Standard is to describe a code which is used to identify the design of corrugated and solid fibreboard cases in order to simplify communication between manufacturers, specifiers, users and other parties involved.

During the preparation of this Standard reference was made on;

EN14053 Packaging —Packagings_manufactured from corrugated or solid fibreboard — Types and construction

Acknowledgment is hereby made for the assistance derived from this source.

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Kenya Standard

Packaging – Packagings manufactured from corrugated or solid fibreboard - Types and construction

1. Scope

This Kenya Standard describes basic types and constructions of corrugated or solid fibreboard packaging. Folding cartons are not covered by this Standard

2. Dimensions

2.1 Dimensions of fibreboard may vary with variation in moisture content of the material. Accurate measurements of dimensions should therefore be performed under standard climatic conditions (Condition 50 % r.h. / 23 ℃ of KS ISO 2233).

2.2 The external dimensions should be taken into consideration when using pallets or containers for distribution.

2.3 The difference between the external and internal dimensions of the case depends on the thickness of the board and the number of plies present.

2.2 Case dimensions

Unless otherwise specified, the dimensions of the erected assembled case are expressed as internal dimensions in mm, and in the following order: L X B X H. The dimensions L, B and H are specified in each description of the case construction but refer normally to:

L (Length) = the longer dimension at the opening

B (Breadth) = the shorter dimension at the opening

H (Height) = the dimension from the top of the opening to the base

Note 1: Dimensions should be measured on the flat blank from the centre of the creases taking into account the thickness of the material as appropriate.

2.3 Telescope type cases

For telescope-type cases the height (h) of the upper part (lid) should be given as a fourth measurement after an oblique stroke, e.g.

355 X 205 X 120/40 mm

(L) X (B) X (H)/ (h)

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2.4 Cases with overlapping outer flaps

For cases with overlapping outer flaps the length of the overlap (o) should be given as a fourth measurement,e.g.

355 X 205 X 120/40 mm

(L) X (B) X (H)/ (o)

2.5 Sheet dimensions

Note 2: Unless otherwise specified, the dimensions of a corrugated board sheet are expressed in mm.

2.5.1 Corrugated board sheet

2.5.1.1 1st dimension X 2nd dimension = (CD X MD) = (across the machine direction) X(along the machine direction).

2.5.1.2 1st dimension = along the glue lines which is parallel to the flutes (CD) 2nd dimension = across the glue lines which is perpendicular to the flutes (MD).

2.5.2 Solid board sheet

1st dimension X 2nd dimension = (CD X MD)

1st dimension = CD (cross direction)

2nd dimension = MD (machine direction).

3 Material thickness

3.1 General

The thickness of a fibreboard material is needed for calculations of the package dimensions. Corrugated board and solid fibreboard are two types of fibreboard material.

3.2 Corrugated board

For corrugated board the material thickness is mainly determined by construction factors, i.e. single wall or multiwall types and by the flute profile(s) used. The thickness of the paper components has only a limited influence on the thickness of the board. For corrugated board there are comparatively homogeneous types of constructions referred to as “flute profiles” or “flute types”.

3.3 Solid fibreboard

Solid fibreboard is available in many thicknesses. The strength properties for the same thickness can show wide differences due to many circumstances in the production, e.g. the pulp and fibre raw material used, the production machine and production methods. The grades are often referred to by basis weight and type of fibre material used. The board producer can give relevant strength properties related to their particular material.

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4 Basic type groups

4.1 General

The design of corrugated and solid fibreboard cases can be as variable as the types of articles to be packed but there are certain recognized basic type groups. The purpose of this section is to describe a code which is used to identify the design of corrugated and solid fibreboard cases in order to simplify communication between manufacturers, specifiers, users and other parties involved.

4.2 Code composition

The code consists of four figures. The two first figures in the code are related to the basic type groups presented below and the second two figures are related to the actual version of the basic types. (See also clause 5)

4.3 Basic type groups

See also clause 8.

4.3.1 Commercial rolls and sheets (01)

4.3.2 Slotted-type cases (02)

Consist basically, of one piece with a glued, stitched or taped manufacturers´ joint and top and bottom flaps.They are shipped flat, ready to use and require closing using the flaps provided.

4.3.3 Telescope-type cases (03)

Consist of more than one piece and are characterized by a lid and/or bottom telescoping over the body of the case.

4.3.4 Folder-type cases and trays (04)

Usually consist of only one piece of board. The bottom of the case is hinged to form two or all side walls and the cover. Locking tabs, handles, displays panels, etc., can be incorporated in some designs.

4.3.5 Slide-type cases (05)

Consist of several pieces of liners and sleeves sliding in different directions into each other. This group also includes outside sleeves for other cases.

4.3.6 Rigid-type cases (06)

Consist of two separate end pieces and a body and require stitching or a similar operation before they can be used.

4.3.7 Ready-glued cases (07)

Consist basically, of one piece, are shipped flat and ready to use by simple erection.

4.3.8 Interior fitments (09)

May include inside liners, pads, partitions, dividers etc., whether linked to a Case Design or as single items.

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4.4 Style versions

Several derivatives of the same style can be described by simply adding a suffix, separated by a hyphen, to the same basic style number (see clause 6), without having to create a new style.

Note 3: A version may be unique to an individual manufacturer.

4.5 Styles and manufacturers' joint

The drawing style layouts as shown in this Code may need to be re-arranged depending on the manufacturers' joint chosen. Some styles may have a manufacturer's joint which may be glued, stitched or taped. A glued or stitched joint may be an extension of either the short or the long panel. Figure 1 shows how these joints may be indicated.

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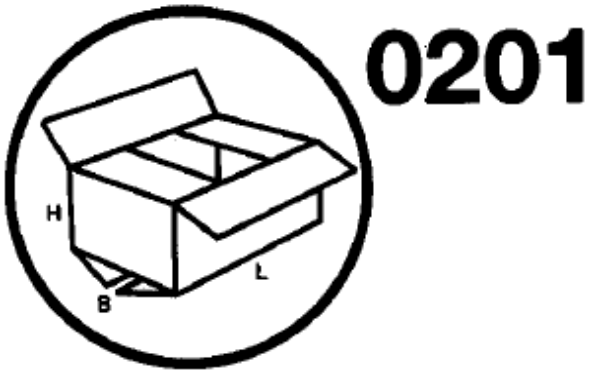

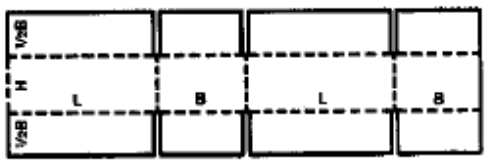

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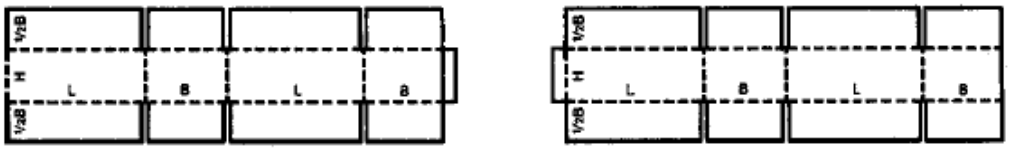

2

Figure 1 — Indication of manufacturer's joint (this example can be applied to all styles)

Key
1 Taped joint
2 Glued or stitched joint

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4.6 Closure of cases

4.6.1 Method of closure

Correct and effective closure of the packages is as important as the packaging construction itself. The following methods of closure are possible either singly or in combination:

by gluing, cold or hot

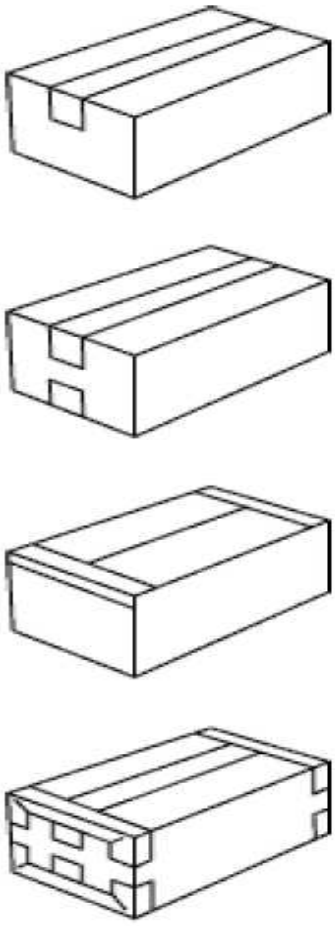
_ by taping

_ by interlocking

_ by stitching

4.6.2 Closing by taping

This can be achieved in many ways, examples are shown in Figure 2.



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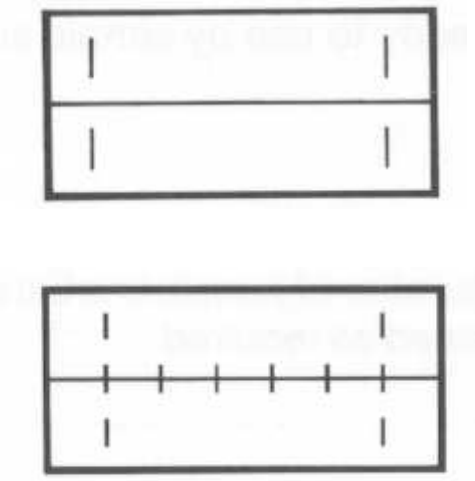
4.6.3 Closing by stitching
This can be achieved in many ways, examples are shown in Figure 3.



5 Coding of the packaging style

The full code consists of two parts:

1) The four digit mandatory first part relates to the styles contained in this Kenya Standard.

2) The second part may be used for coding personal variations derived from the basic styles.

Full code: XXXX-YYYY

Style XXXX

The standard recognized

Shape/design from this code.

Style version: - YYYY

The version coding to differentiate the variation from the standard design (corresponding to an individual drawing

or CAD/CAM library).

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Example of coding	0204 - Standard code	0815 - Additional Coding	TJ personal Manufacturer's reference

6 Combination of types

The construction styles shown are of the basic types of fibreboard cases. If the ultimate construction is a combination of two or three basic models, e.g. flap arrangements, they may also be described as follows:

Top flaps as 0204, Bottom flaps as 0215

Note 2: This type may also be described as 0204/0215 Top/flaps/Bottom flaps see Figure 4

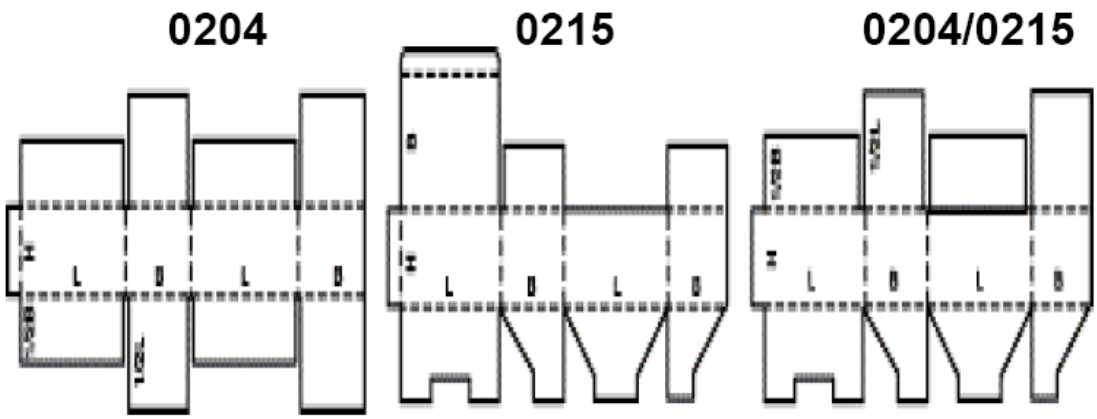

Figure 4 — Combination of types

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7 Symbols used in drawings and computer systems

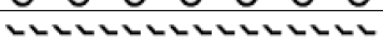
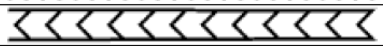
Drawing symbol	Computer code	Description
Cuts, scores, slits etc.		
	CL	contours of erected cases or cutting lines of case blanks
	SC	slotted cuts
	CI	crease lines (inward bend)
	CO	crease lines (outward bend)
	SI	slit-score lines (inward bend)
	SO	slit-score lines(outward bend)
	DS	double-score lines
	PL	perforation lines
	SE	soft edge cutting lines
	TP	tear perforation
Manufacturer's joint		
	SJ	Stitched joint
	TJ	Taped joint
	GJ	Glued joint
Openings		
	PC	handholds stripped
	UC	handholds non-stripped
	NC	handholds non-stripped
Flute direction		
	FD	Flute direction indicator

Figure 5 — Symbols used in drawings and computer systems

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8 Standard designs

Standard designs are shown in Figure 6 to Figure 12 and with the exception of Figure 6 represent one drawing for each basic group. They show the erected packaging and the blank used. The drawing of the packaging blank is as viewed from the inside of the packaging. In the drawings of the erected packaging, L, B, H and h are related to the internal dimensions of the cases. (Further examples are shown at annex B)

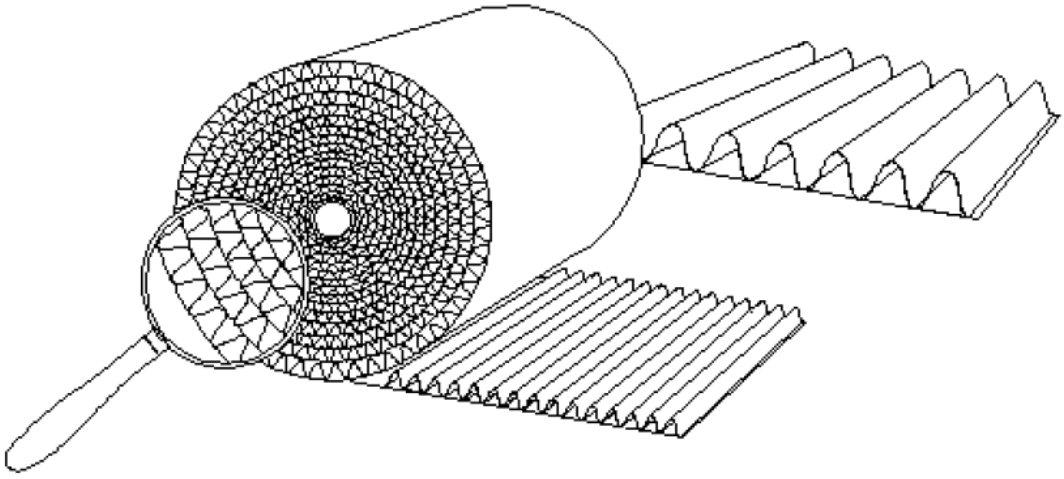
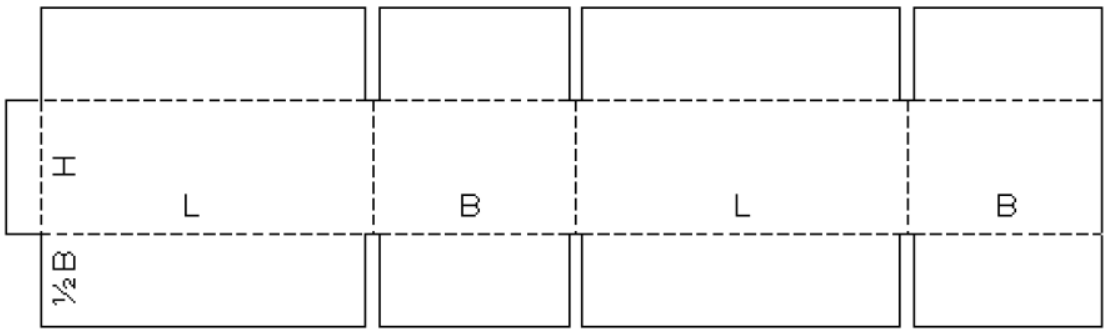


Figure 6 — 0100 Commercial rolls and sheets



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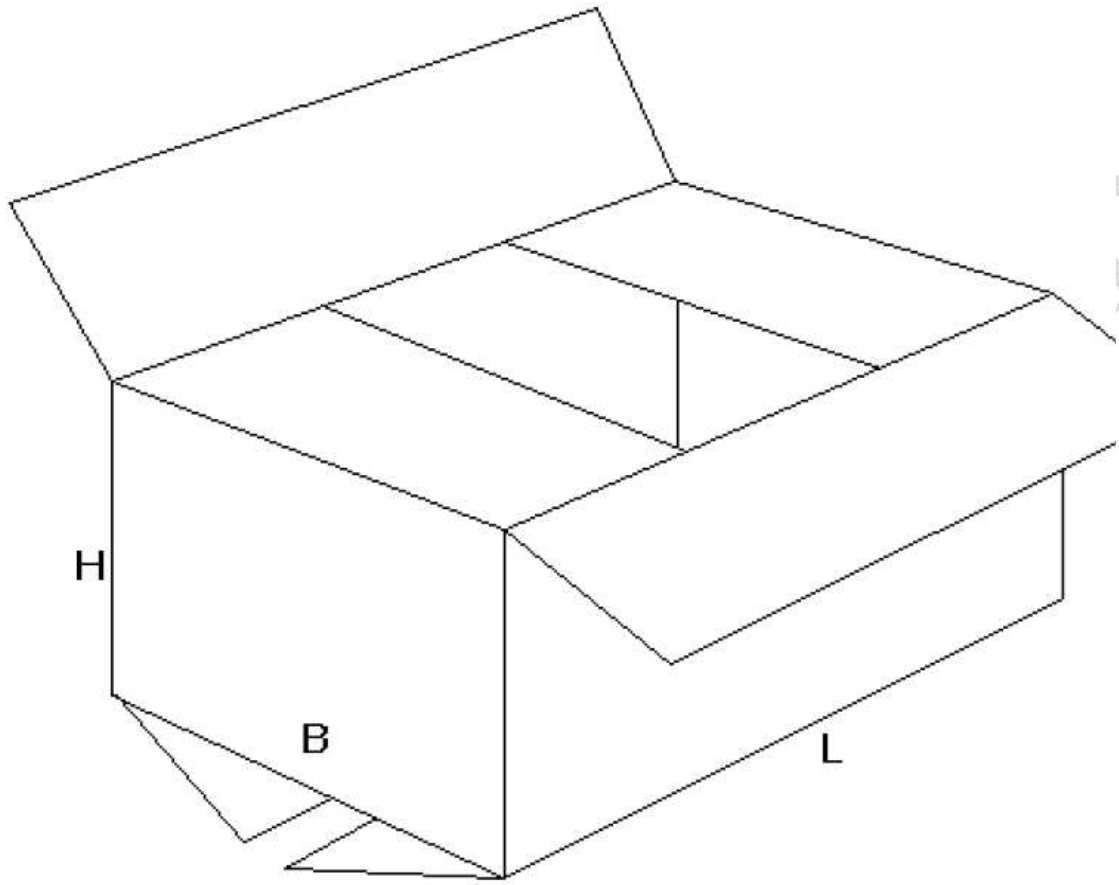

Figure 7 — 0201 Slotted-type cases

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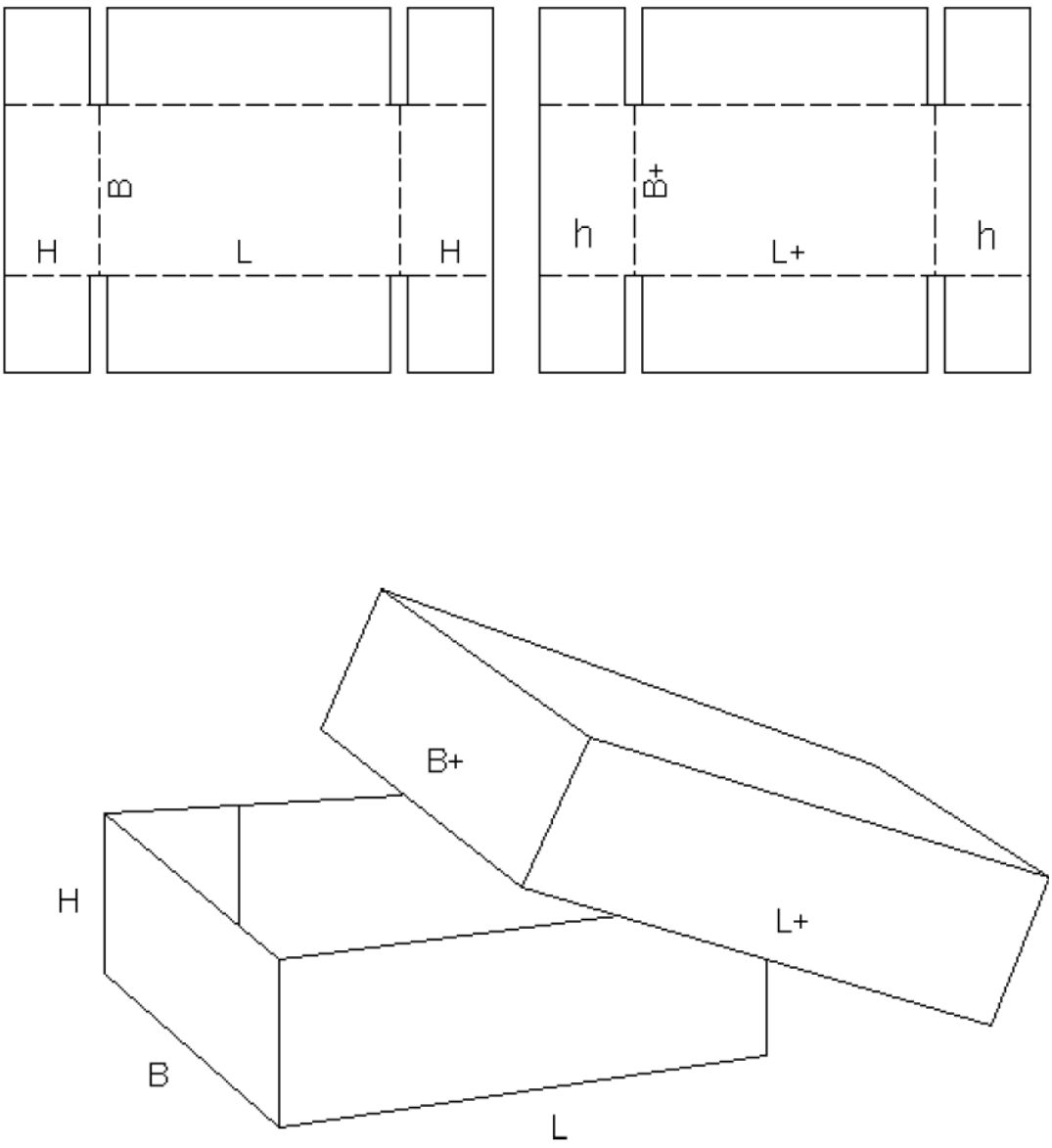

Figure 8 — 0300 Telescope-type cases

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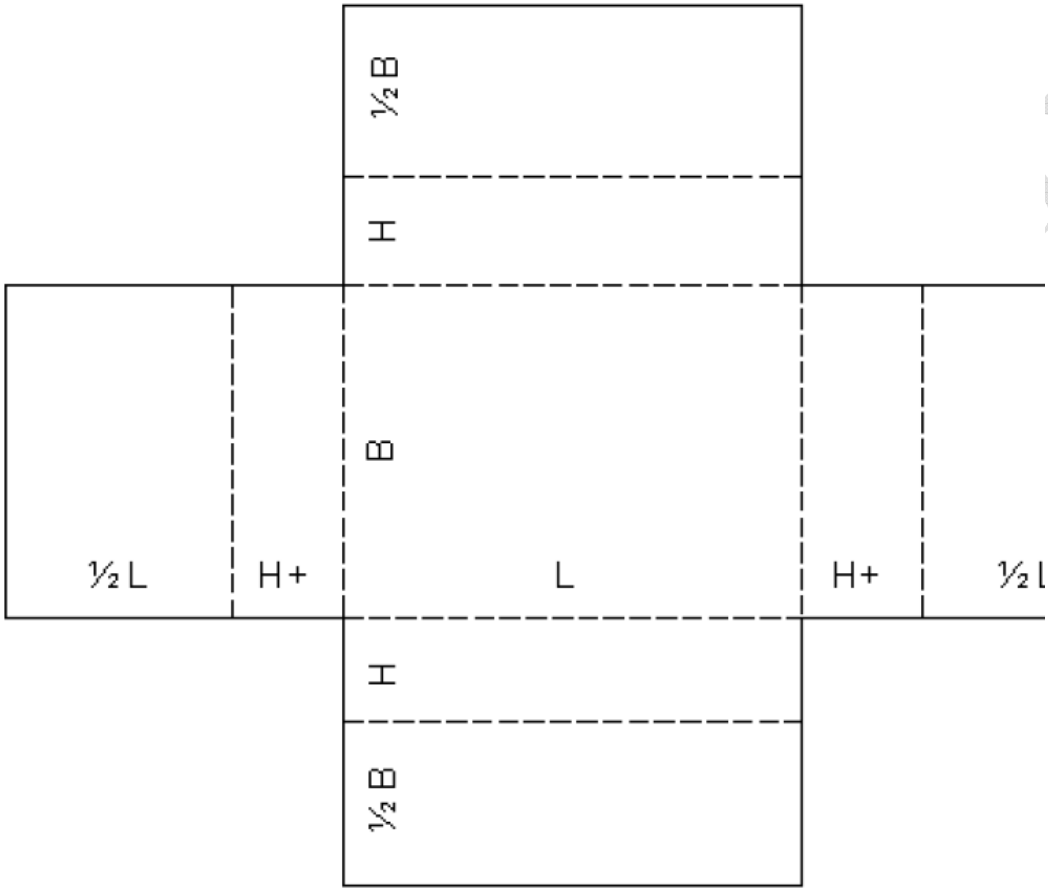

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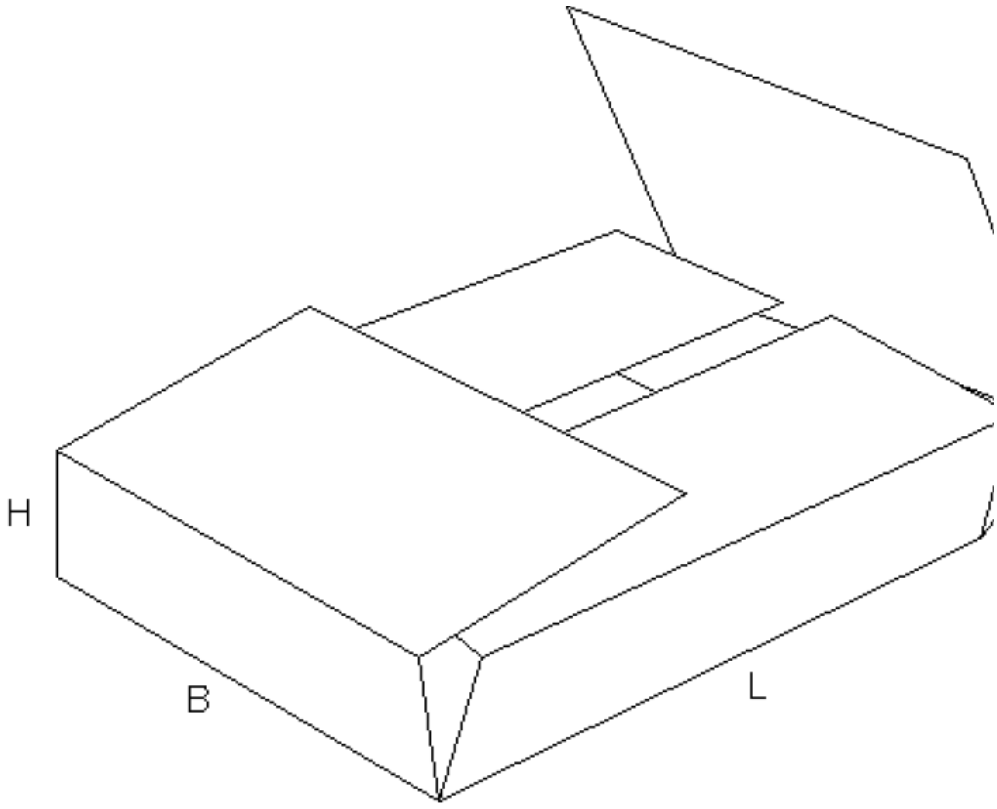

Figure 9 — 0402 Folder-type boxes and trays

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Annex A

(informative)

Functionality considerations of fibreboard cases

A.1 Introduction

Fibreboard cases are suitable, both as inner and outer containers, for the transport of a wide variety of goods for both internal and export markets, if necessary with suitable fitments.

The purpose of this appendix is to give some outline guidance on the selection of materials and constructions for fibreboard cases.

A.2 General considerations

The selection of a package construction and appropriate material should be based on functional performance criteria. The basic performance requirements for packaging are related to the demands during transport and storage, i.e. containability and protection of the goods. The load bearing (stacking) capacity for a package is significant when containers are to be stacked on top of each other, taking into consideration that there are significant differences between static and dynamic loads.

Estimation of safe stacking loads can be made based on the compression resistance taking into account a numberof factors including case design, prevailing temperature and humidity, stacking mode and duration of storage.

The strength properties and dimensions of a fibreboard packaging are dependent on the moisture content of the material. The moisture content is related to the relative humidity of the air surrounding the packaging. Fibreboard

cases should be measured and tested under standard climate conditions (see clause 3).

Fibreboard cases should be stored dry under cover on a flat surface or pallet preferably in conditions between 30 % r.h. and 70 % r.h.

Extremes of temperature should be avoided.

The package selected is dependent on the nature of the goods to be packed and the anticipated hazards of storage, handling, transport and climatic conditions to which the package will be subjected during the whole transportation chain. With a knowledge of the principal performance requirements and the severity of the conditions, the selection of appropriate board grades can be facilitated.

A number of goods specific circumstances also have to be taken into account in the package selection e.g.

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packaging machinery used, dimensional co-ordination requirements, unit load principles, specific risks connected to the goods (dangerous goods regulations), printability aspects.
Other factors may also affect the package selection. For example when printing directly onto the board, high quality printing can be achieved on solid board. When printing on corrugated board the best results can be achieved with the finer flute profiles or by using lining paper with a high grammage.
Coarse flute profiles and double wall types may more efficiently give compression resistance as well as improved
resistance to side wall bulge and more efficient cushioning. Double wall or triple wall types will be necessary for the most demanding applications.
When fibreboard cases are intended for use in very humid or wet conditions special consideration should be given to the selection of the material components.
Note:4 Particularly for wet conditions the use of a variety of impregnations, coatings or laminations may be considered.

A.3 Design considerations

Where the contents do not conform to the shape or dimensions of the case, internal fitments and/or cushioning materials should be provided to restrict movement of goods inside the case and to give support to the case. Where fitments are necessary, their design and selection is just as important as the choice of the case.
Whenever possible the pack designer should be given a specimen set of the articles to be packed together with all the available relevant information including the following:
a) transport, (e.g. rail, road, sea, air), method of shipment, (e.g. as individual packages, palletized loads or infreight containers) and the number of trans-shipments;
b) warehousing, (e.g. whether palletized, stacking mode, height of stacking, duration of storage).
c) climatic conditions to be encountered, (e.g. humidity and temperature).
When a specimen set is not available, a complete description of the article(s) to be packed should be provided with other relevant information to enable the pack designer to estimate the overall performance requirements. When
compression resistance is important the direction of the flutes in a corrugated case when stacked should be considered, as the resistance will generally be greatest when the flutes are in the vertical direction.
For solid board cases the compression resistance will most often be greatest when the machine direction of the fibres in the constituent papers are in the vertical direction.
The actual resistance to compression of fibreboard packages can be determined by the following methods:
ISO 12048 and ISO 2234.

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Handholds are an optional feature. Care should be exercised in specifying handholds for cases constructed fromlighter grades of board since their provision can render such cases less able to withstand certain types of handling.

Punching may reduce packaging strength

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Annex B

(informative)

Further examples

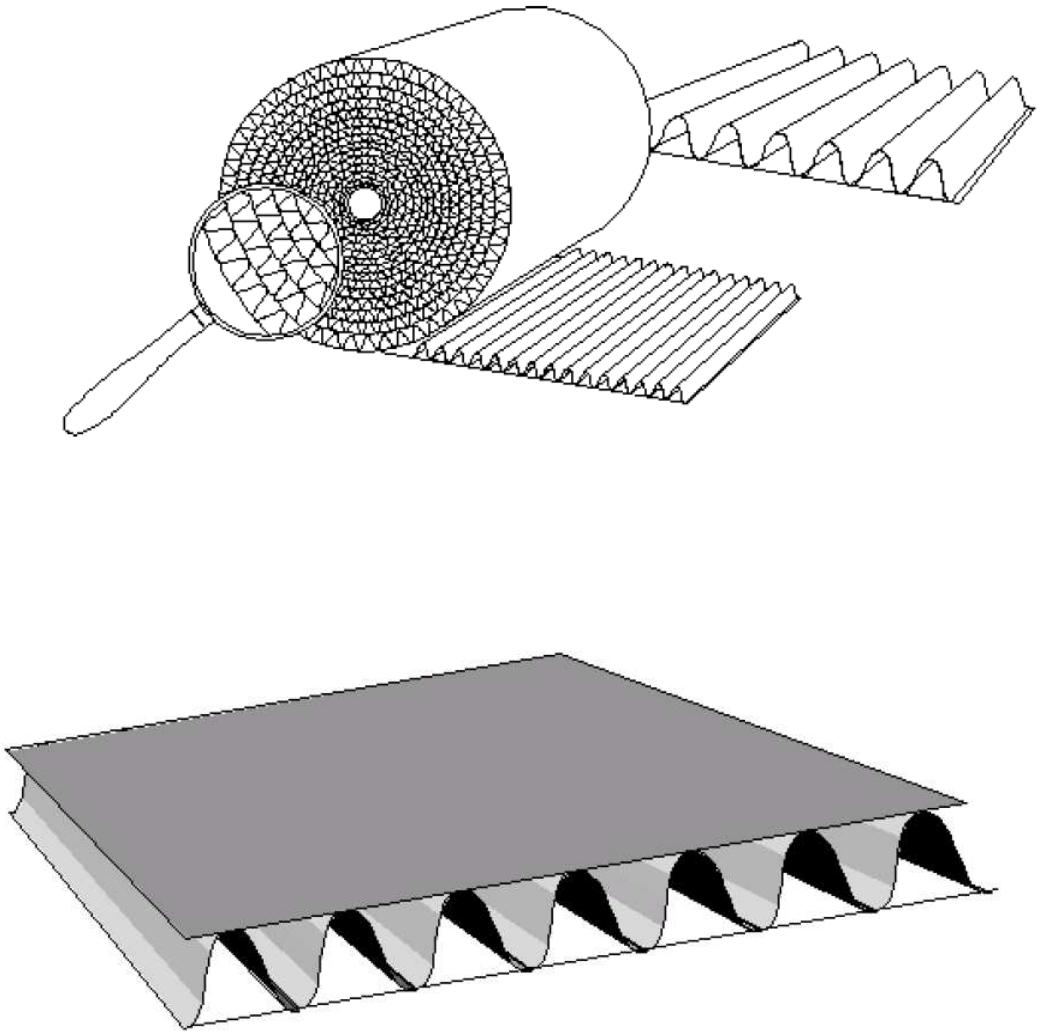

Figure B.1 — Commercial 0100 rolls and 0110 sheets

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