What is FEFCO?

Corrugated packaging is the most popular cardboard shipping packaging. The EEU countries recognize designs developed by the Unions of European Manufacturers of pasteboard (FEFCO) and corrugated cardboard (ASSCO) packaging as the standard of corrugated packaging. Each design in the FEFCO—ASSCO system is assigned with an identification number which can directly be used in the order.

- **02xx —** folding corrugated boxes of simplified design made from a single blank with flaps, bottom and a side joint, which, after being secured with glue, staples or tape, forms a side sleeve.
- **03xx —** telescope-type corrugated boxes with a separate body and lid, with the lid telescoping over the body of the box.
- **04xx —** folder-type boxes and the most of the stamped cases assembled with locking tabs and without glue, staples, adhesive tape, and other additional materials.
- **05xx —** boxes assembled with staples, tapes or glue using parts of a frame type, as well as parts of a frame type for other cases.
- **06xx —** corrugated boxes assembled with staples, tapes or glue using two separate end pieces and a sleeve connecting them.
- **07xx —** readymade folding corrugated boxes mainly of one piece.
- **09xx** – interior fitments of the box: inside liners, lattice, pads, partitions, and etc.

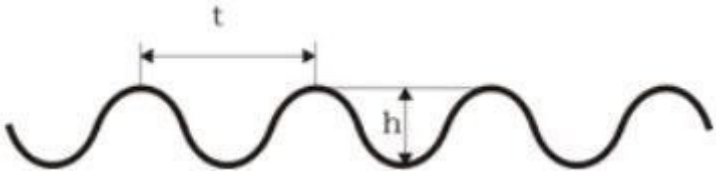
The FEFCO catalogue is used by producers of packaging as the industry guidelines for all types of works related to the production of packaging from corrugated cardboard.

Corrugated cardboard sheets: types, grades, fluting profiles

Corrugated cardboard profiles

The corrugated cardboard is characterized by a corrugated (fluted) layer. The corrugated cardboard consists of alternating flat layers (liners) and fluted layers glued with various adhesives along the contact line between the peak and base surfaces of flute and flat layer.

The main features that define the types of flutes are a flute height (h) and a flute pitch (t). The flute height is the vertical base to peak distance of a flute, while the flute pitch is the horizontal distance between adjacent flute peaks. A certain combination of features (flute height and pitch) is called a profile.



Profile	Height	Pitch	Number of flutes per 1 running meter of corrugated sheet
E	1.1 - 1.6 mm	3.2 - 3.6 mm	295 - 315
B	2.2 - 3.2 mm	4.5 - 6.5 mm	160 - 222
C	3.2 - 4.5 mm	6.5 - 8 mm	125 - 155

Main applications of three-layer corrugated cardboard sheets depending on their profile

C-flute corrugated cardboard is intended for making boxes and containers for transportation and storage of goods (high stacking strength).
B-flute corrugated cardboard is intended for making boxes, containers and trays for transportation and storage of goods (low stacking strength, good printing properties).
C-flute corrugated cardboard is intended for making small sized packaging (low stacking strength, perfect printing properties).

Main applications of five-layer corrugated cardboard sheets depending on their profile

CB-flute corrugated cardboard is intended for making boxes and containers for heavy items which require good protection (very high stacking strength, high resistance to impacts).
CE-flute corrugated cardboard is intended for making boxes and containers for heavy items which require good protection (high stacking strength, high resistance to impacts, good printing properties).

Corrugated cardboard types and grades

The grade of corrugated cardboard is determined on the basis of its compliance with GOST.
The corrugated cardboard is classified as multilayer materials and its thickness depends on a number of liners and flutings.


T – three-layer corrugated cardboard consists of two liners and one fluted layer.

 **П – five-layer corrugated cardboard** consists of three liners (one inner and two outer ones) and two fluted layers.

Application of three-layer corrugated cardboard sheets of Т22 - Т27 grades
- manufacture of packaging and auxiliary packaging materials intended for packing products that are resistant to static loads.

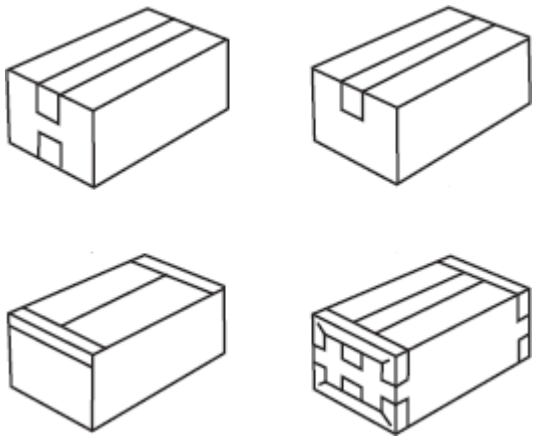
Application of five-layer corrugated cardboard sheets of П-32-34 grades
- manufacture of shipping packaging for products that require enhanced protection from mechanical damage and impacts;
- manufacture of large-size corrugated packaging;
Corrugated cardboard of П-35 grade
- manufacture of large-size high-strength and rigid packaging, containers.

Closure of boxes and coding of interior fitments

Box closing methods

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

Closing by taping
This can be done according to the examples shown.



Closing by stitching
This can be done according to the examples shown:

Coding of interior fitments

The following range of interior fitments is coded depending on the number of panels used, in any combinations.

Number of panels		CODE
2	>	0982
3	>	0983
4	>	0984
5	>	0985
6	>	0986
7	>	0987
8	>	0988
9	>	0989
10	>	0990
11	>	0991
12	>	0992
13	>	0993
14	>	0994
15	>	0995
16	>	0996
17	>	0997
18	>	0998
19	>	0999

0982/0999
M

Explanatory notes to drawings of corrugated cardboard packaging

Case dimensions

Unless otherwise specified, all dimensions are expressed as internal dimensions in mm as follows: Length (L) x Breadth (B) x Height (H)

where:
Length (L) – the longer dimension at the opening
Breadth (B) – the shorter dimension at the opening
Height (H) – the dimension from the top of the opening to the base

The dimensions L, B, H are specified in each description of the case construction, for some models the numerical value of B can be expressed through the numerical value of L.
Dimensions should be measured under standard conditions (temperature, pressure, etc.), on the flat blank from the center of crease bearing the thickness of the material in mind.
For telescope-type boxes (with lid) the height (h) of the upper part (lid) should be given as a fourth measurement after an oblique stroke, i.e.

355x205x120/40
(L) (B) (H) (h)
For cases with overlapping outer flaps the length of the area of overlapping (o) should be given as a fourth measurement.

Sheet dimensions

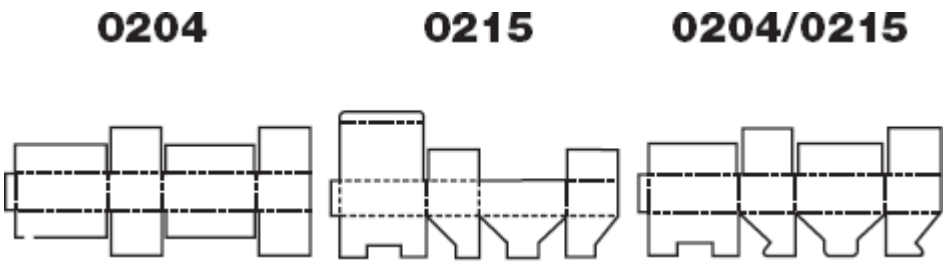
Unless otherwise specified, the dimensions of corrugated sheets are expressed in mm as follows:
1st dimension x 2nd dimension,
where
1st dimension –along the glue lines
2nd dimension – across the glue lines.

Style versions

Some case types may have derived versions. In this case a suffix should be added to the basic style number separated by a dash.
Example: 0201-2
A version may be unique to individual manufacturers.

Combination of types

If the ultimate construction is a combination of several basic models, e.g. flap arrangements, they may also be described with reference to other types of packaging. For example – top flaps as 0204, bottom flaps as 0215 or also as 0204/0215 (top flap, bottom flap)



Style of manufacturer's joint

Drawing style layouts may be rearranged depending on the Manufacturer's joint chosen. In case of a glued or a stitched joint it is necessary to provide for additional flaps for gluing unlike the style with a taped joint.

Automated or manual erection

Each design style includes one of the following indications:
M – usually manual erection
A – usually automated erection
M/A – can be either manual or automated
M+A – requires a combination of both.

These indications are based on practical observations and are intended to give additional information to the users of the catalogue. Some types of cases having a "manually erected" mark can be closed automatically.

Description of basic packaging types

Please note that several case designs falling into a certain group can also be classified under other groups.

01 – Commercial rolls and sheets

02 – Slotted-type boxes

Slotted-type boxes usually consist of one piece with a glued or stitched manufacturers joint and top and bottom flaps. They are shipped flat, ready to use and require closing using the flaps provided.

3 – Telescope-type boxes
Telescope-type boxes consist of more than one piece and are characterized by a lid and/or bottom telescoping over the body of the box.

4 – Folder-type boxes and trays
Folder-type boxes and trays usually consist of only one piece of corrugated board. The bottom of the box is hinged to form two or all side walls and the cover. Additional box elements can be incorporated in some designs.

5 – Slide-type boxes
Slide-type boxes consist of several pieces of liners and sleeves sliding in different directions into each other. This group also includes outside sleeves for other cases.

6 – Rigid-type boxes
Rigid-type boxes consist of two separate end pieces and a body which forms a top and a bottom. These boxes are supplied as separate components to be stitched by a user.

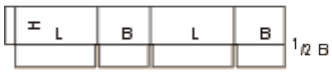
7 – Ready-glued cases
Glued cases are supplied readymade and do not require any significant operations to get them prepared for use.

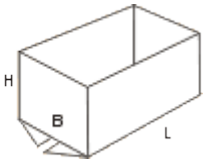
09 – Interior fitments
Interior fitments such as inside liners, pads, partitions, dividers etc., whether tied to Case Design or as singular items. Any shown number of panels is arbitrary and may be increased or decreased as required.

Writing of the style code
Full packaging code looks as follows: **XXXX-XXXX**, where the first part is a case type or design with type, the second part – version number to differentiate the variation from the standard design.

Complex-cut corrugated cases (codes 02xx)

0200





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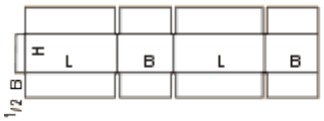

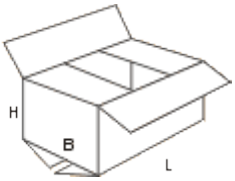

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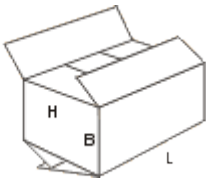

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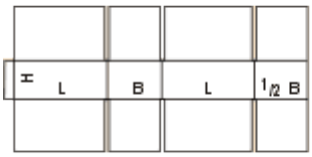

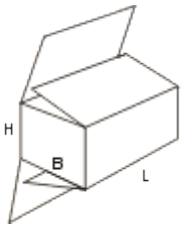

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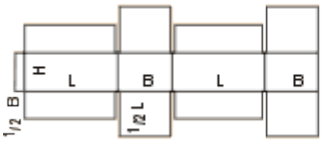

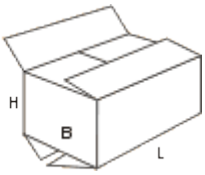

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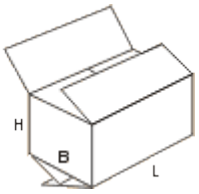

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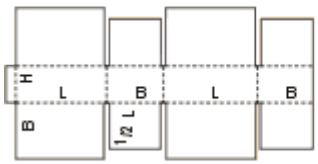

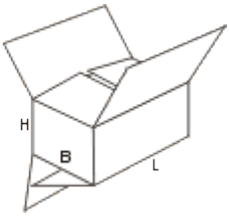

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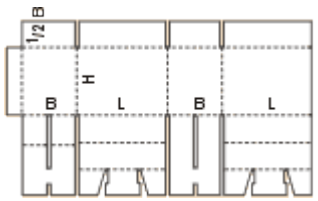

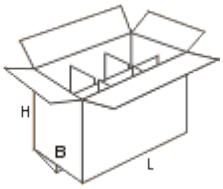

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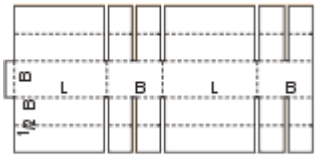

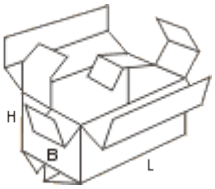

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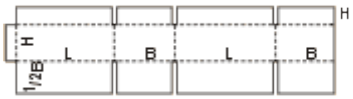

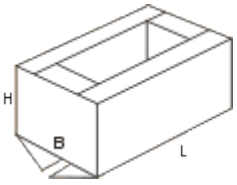

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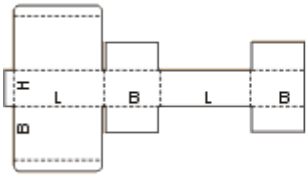

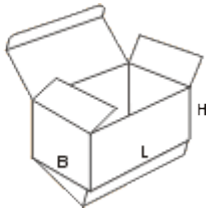

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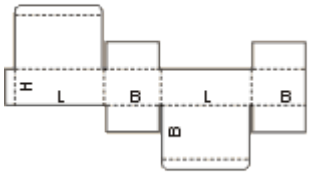

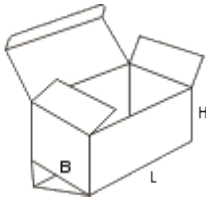

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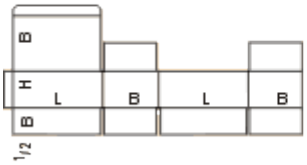

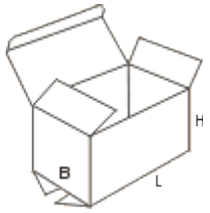

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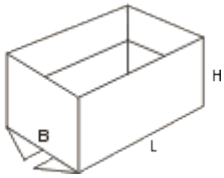

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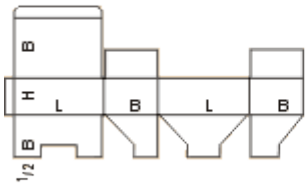

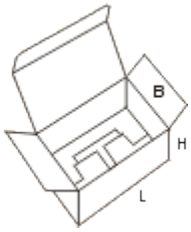

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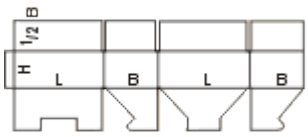

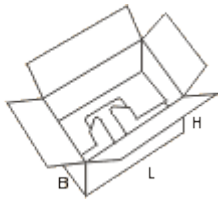

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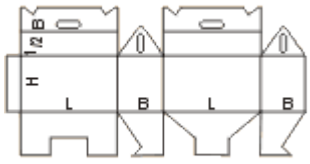

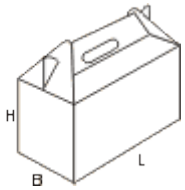

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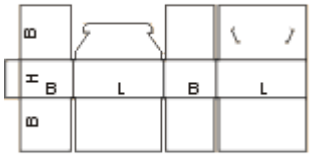

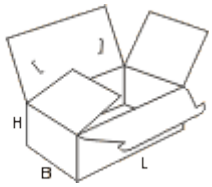

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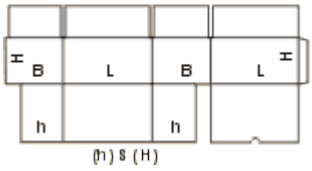

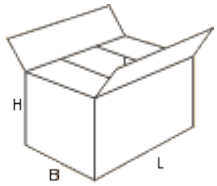

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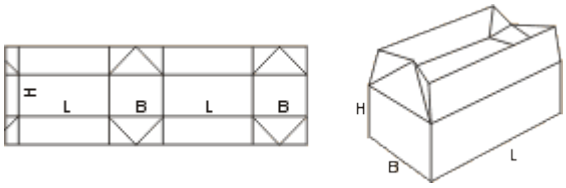

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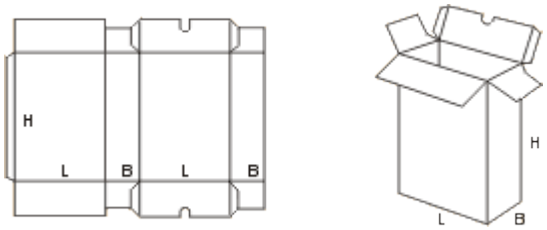

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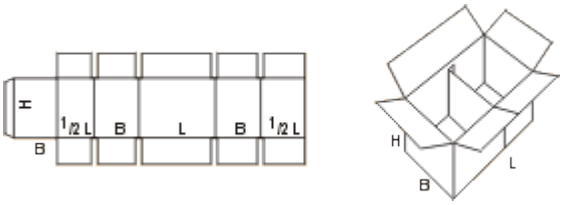

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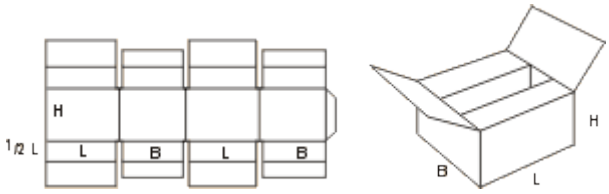

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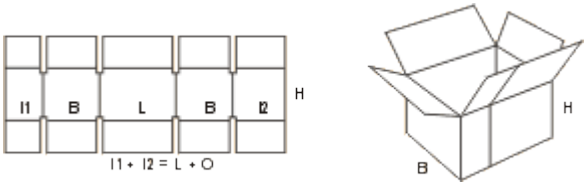
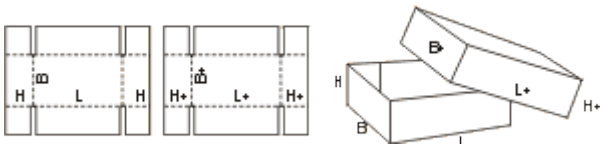
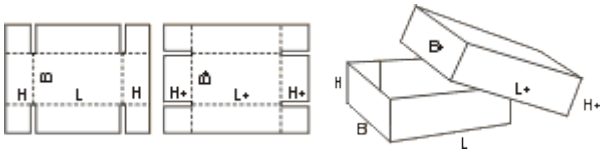


Complex-cut corrugated cases (codes 03xx)

0300



0301



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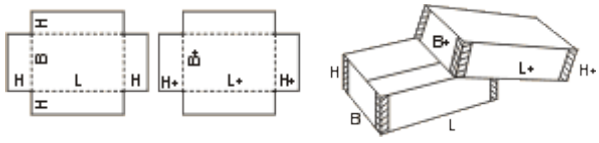

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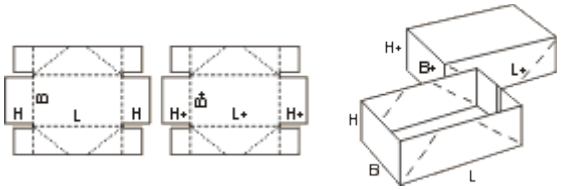

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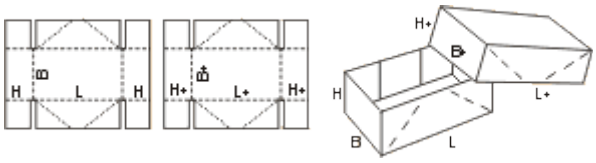

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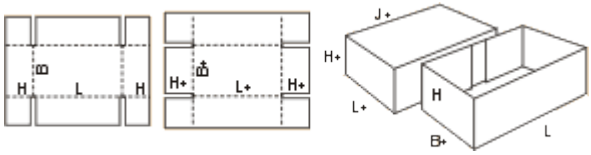

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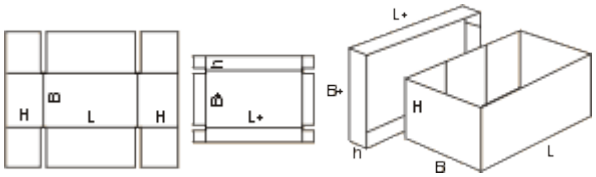

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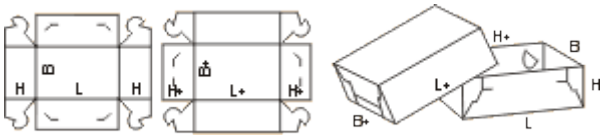

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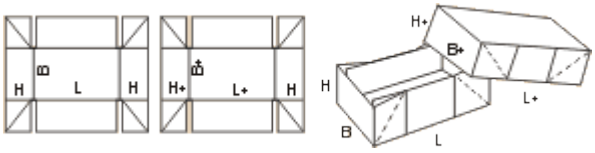

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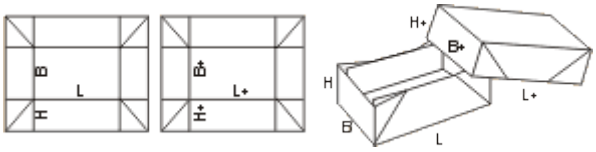

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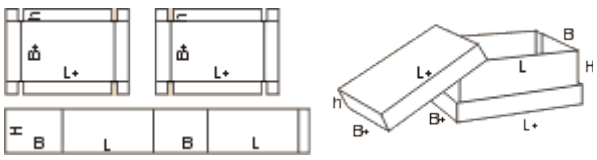

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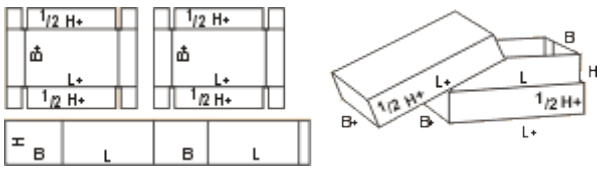

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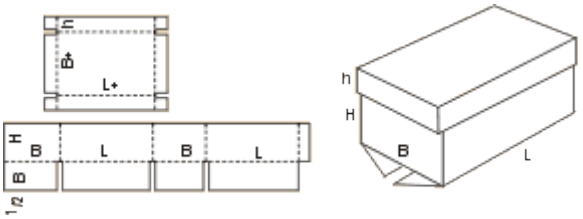

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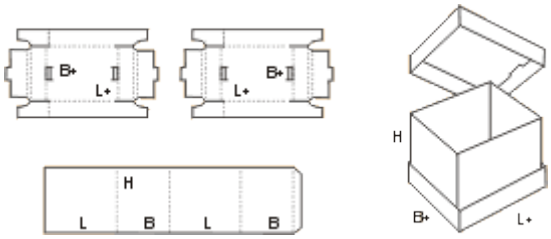

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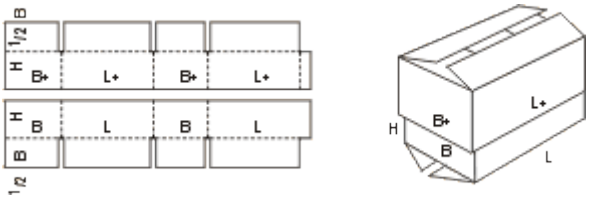

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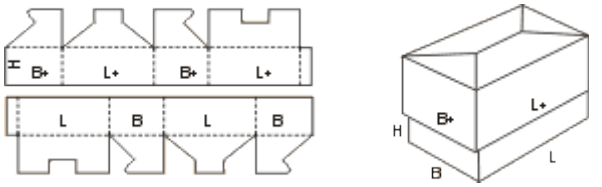

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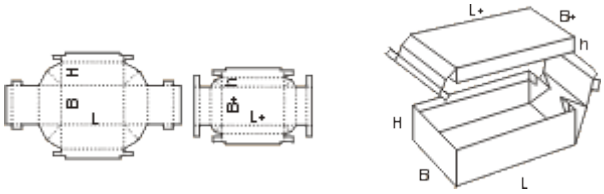

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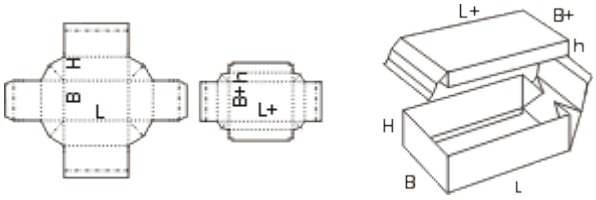

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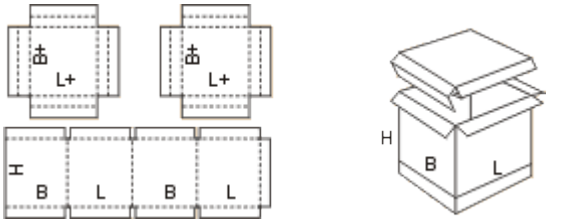

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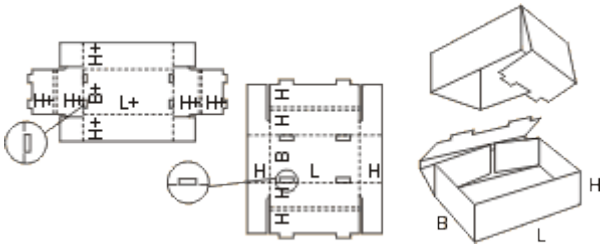

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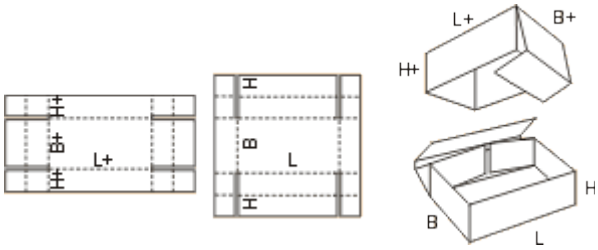

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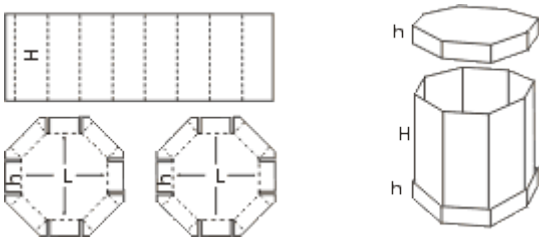

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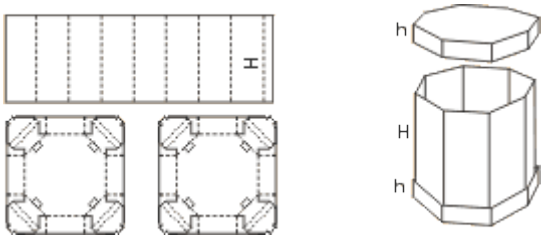
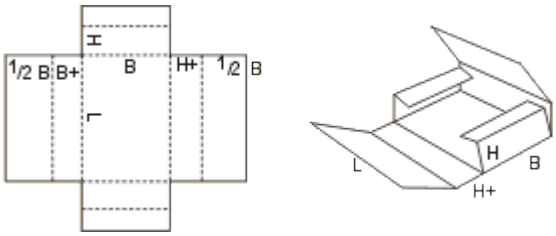


Complex-cut corrugated cases (codes 04xx)

0401



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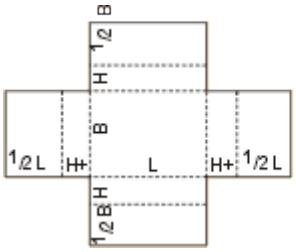

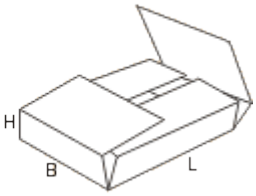

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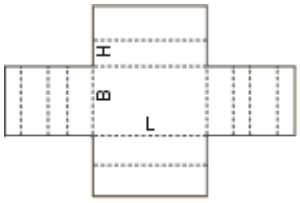

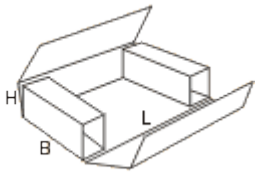

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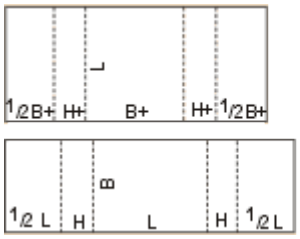

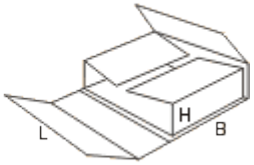

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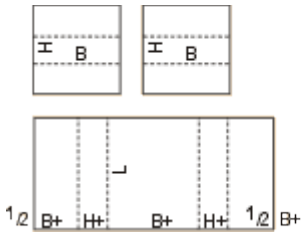

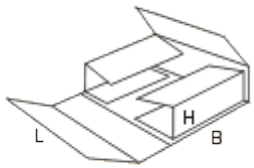

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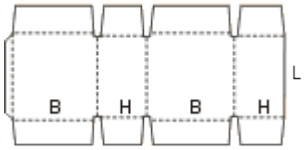

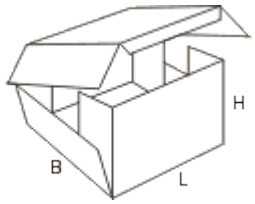

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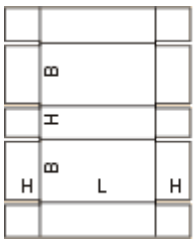

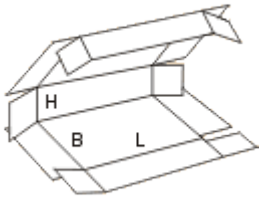

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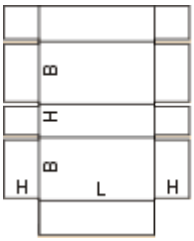

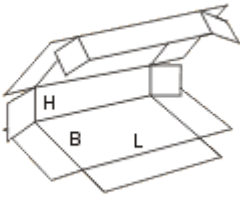

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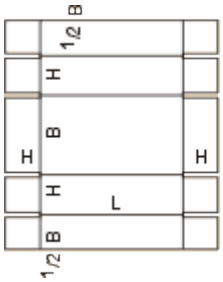

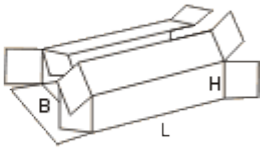

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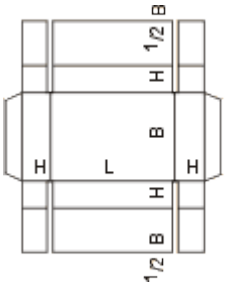

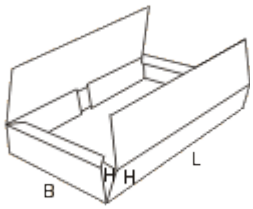

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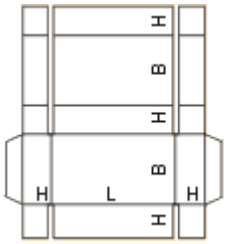

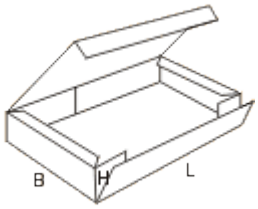

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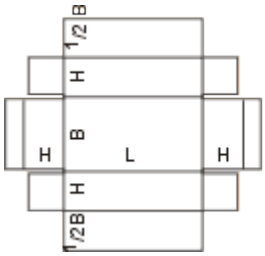

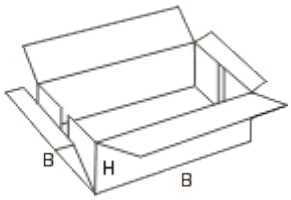

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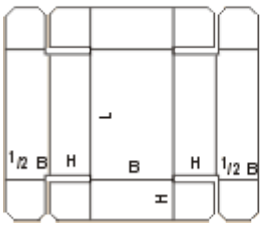

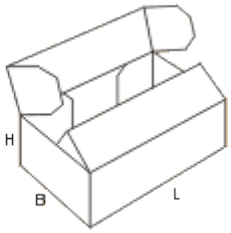

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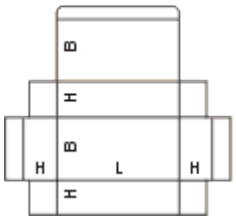

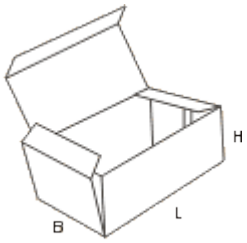

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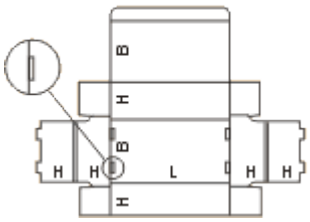

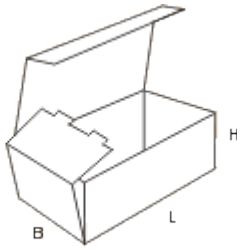

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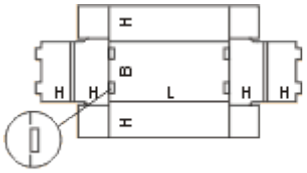

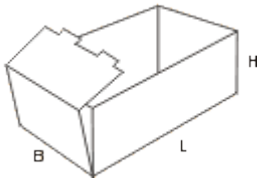

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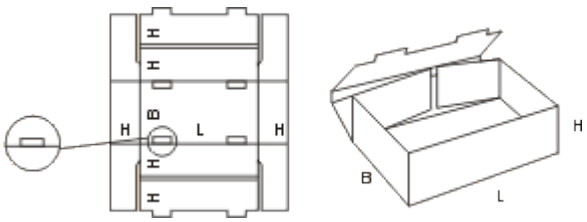

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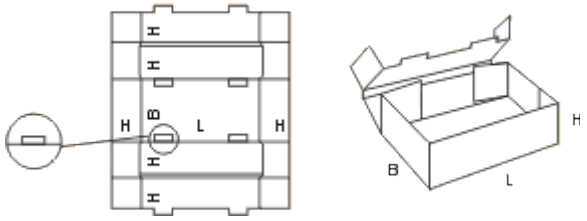

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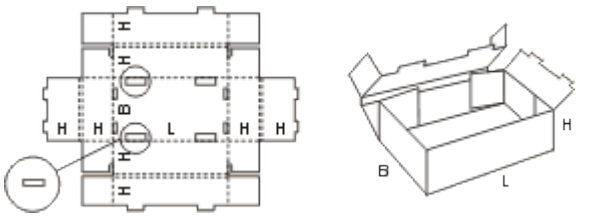

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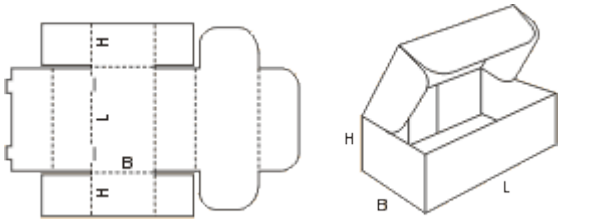

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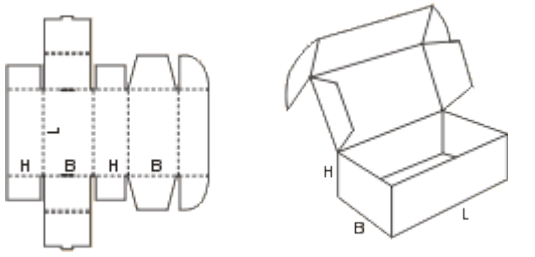

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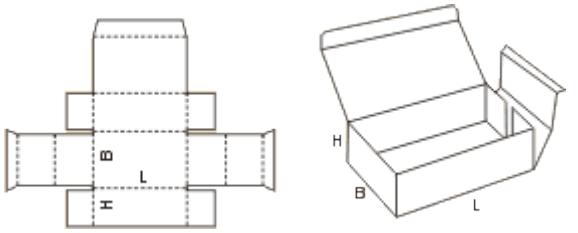

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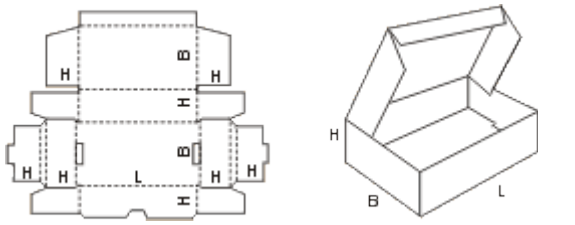

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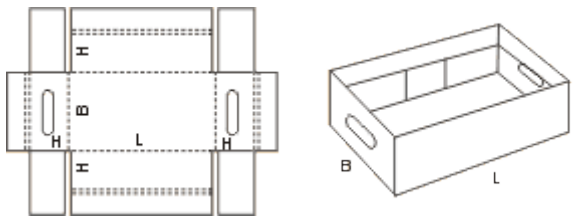

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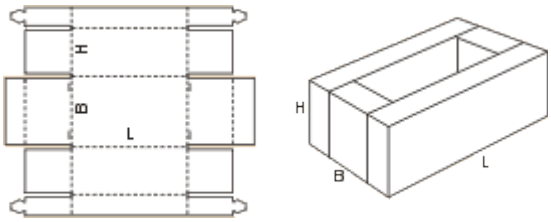

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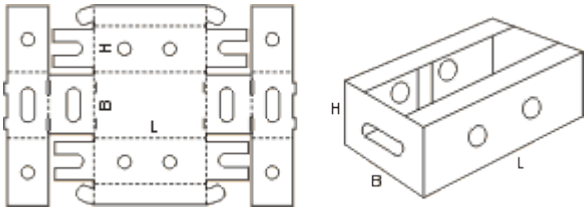

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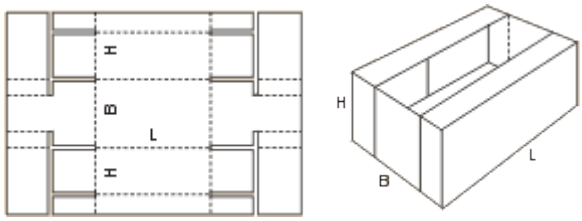

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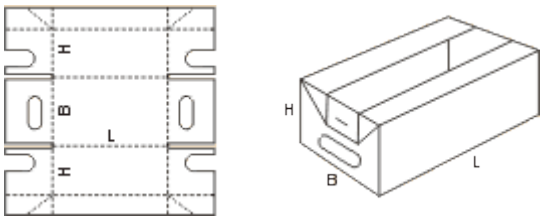

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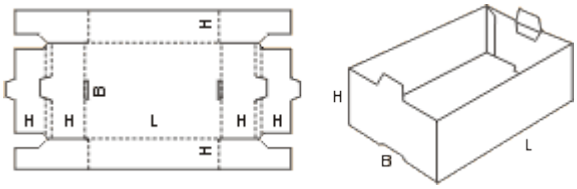

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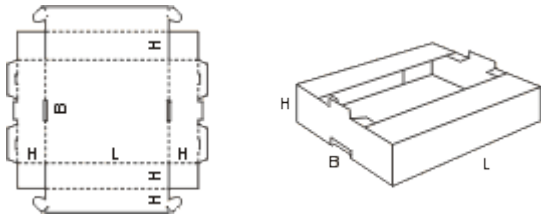

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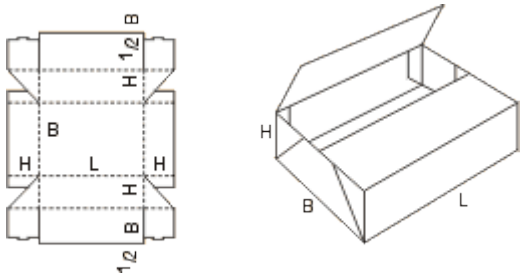

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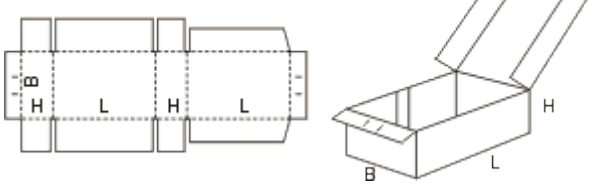

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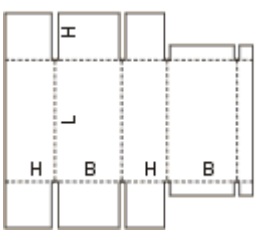

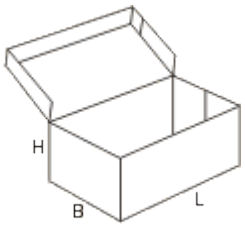

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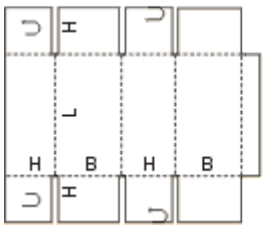

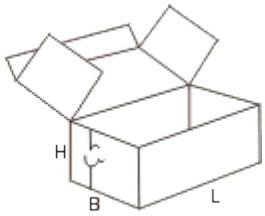

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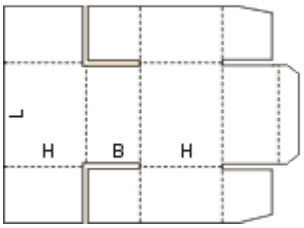

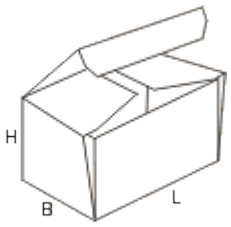

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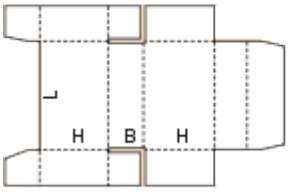

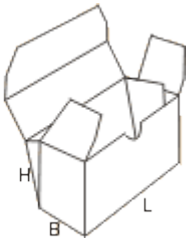

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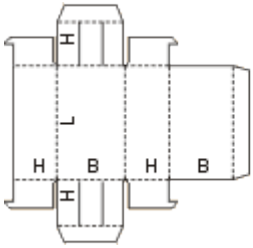

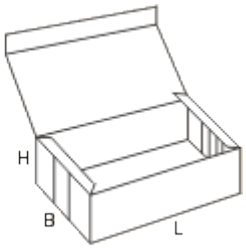

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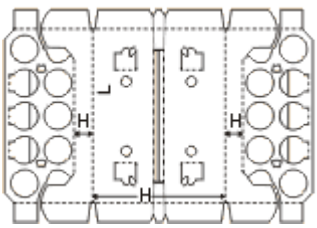

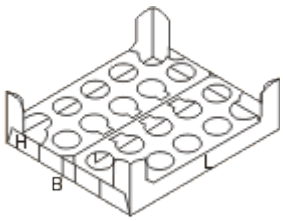

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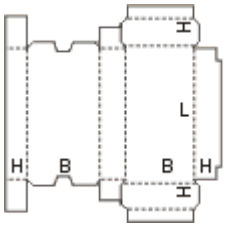

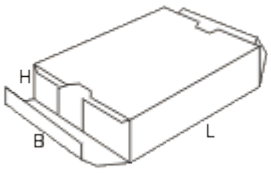

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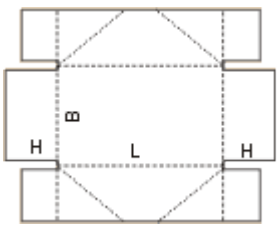

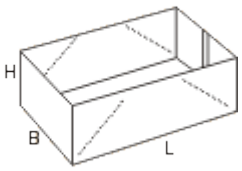

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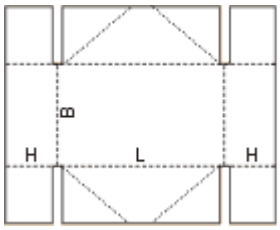

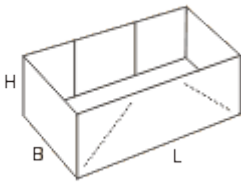

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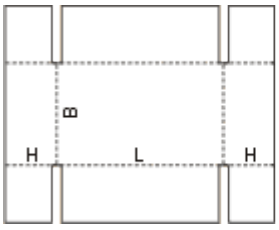

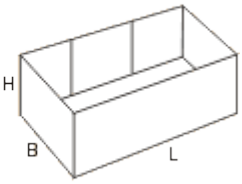

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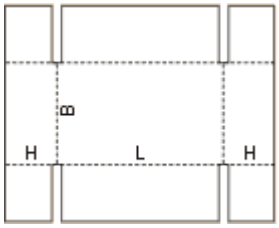

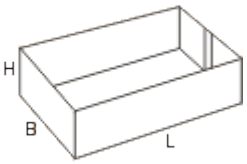

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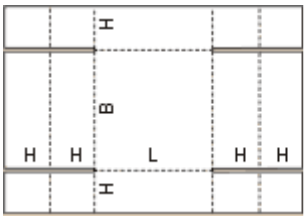

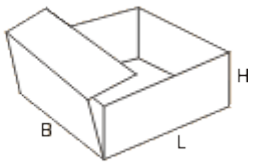

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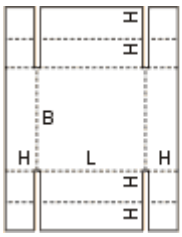

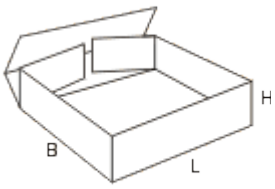

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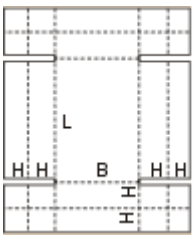

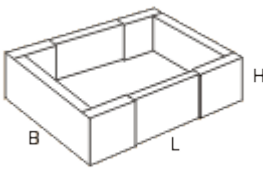

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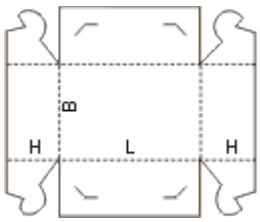

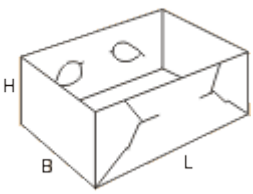

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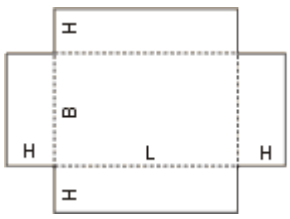

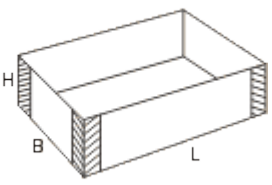

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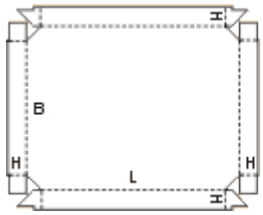

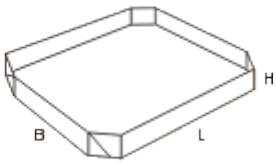

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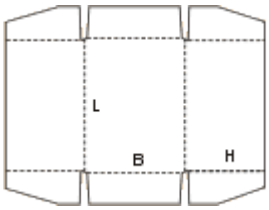

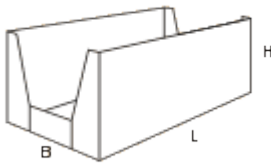

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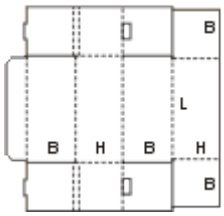

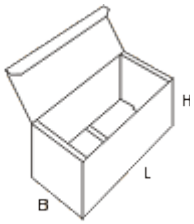

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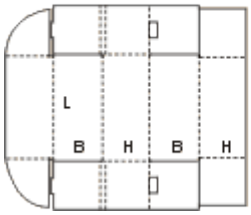

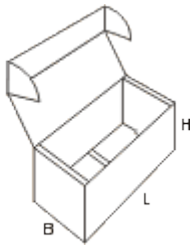

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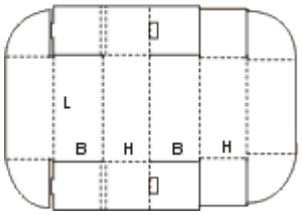
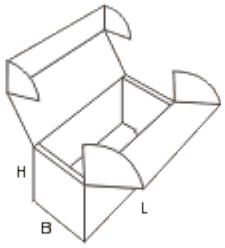
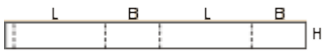
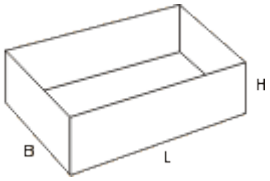




Complex-cut corrugated cases (codes 05xx)

0501





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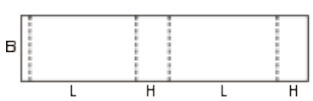

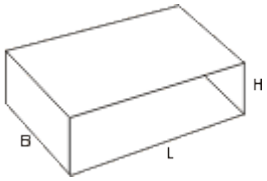

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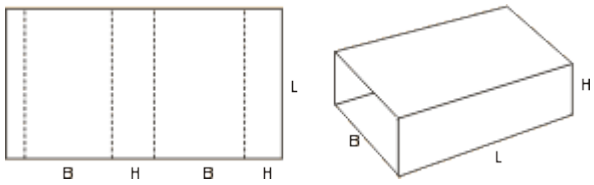

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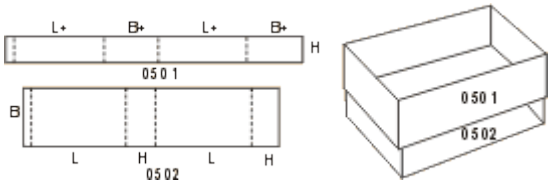

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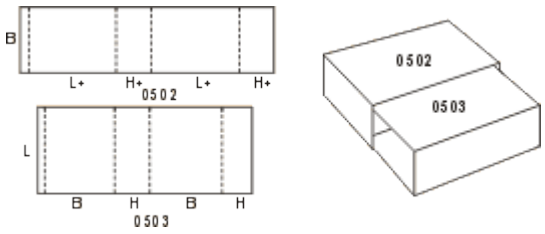

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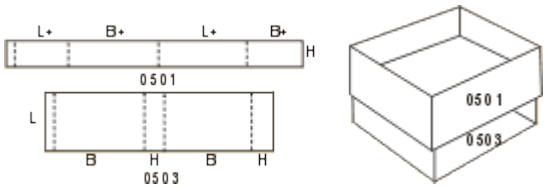

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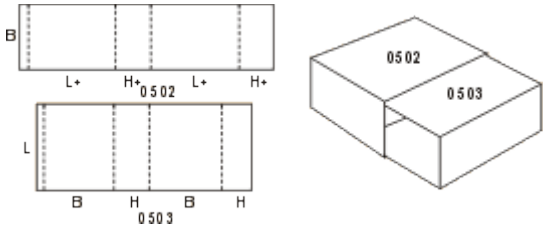

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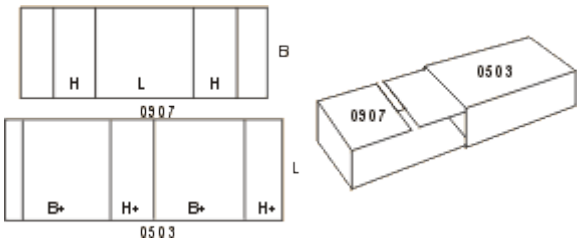
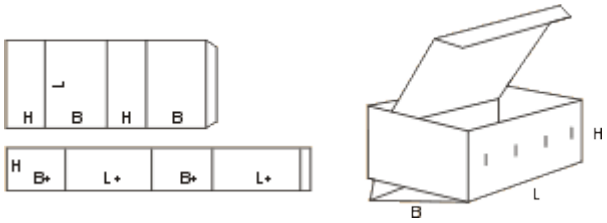


0510



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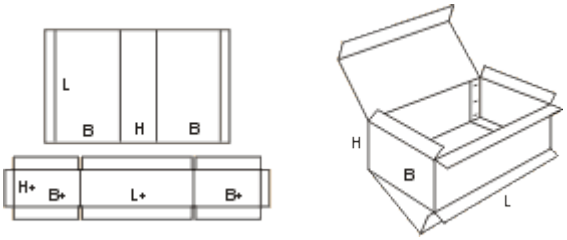
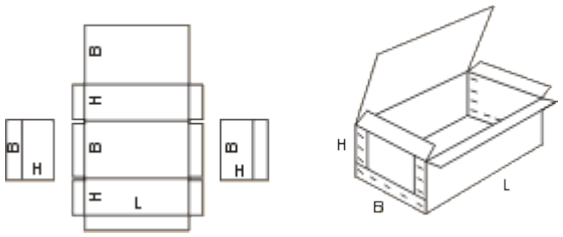


Complex-cut corrugated cases (codes 06xx)

0601



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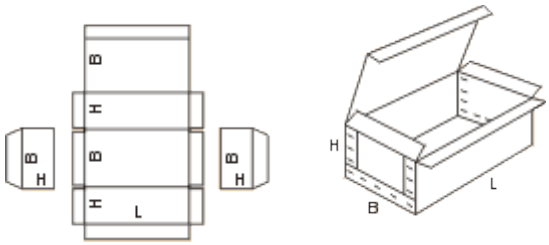

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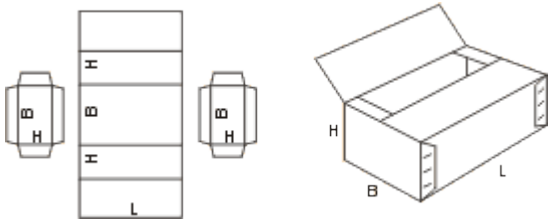

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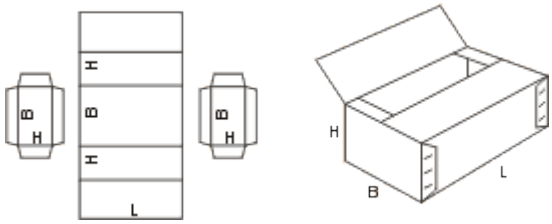

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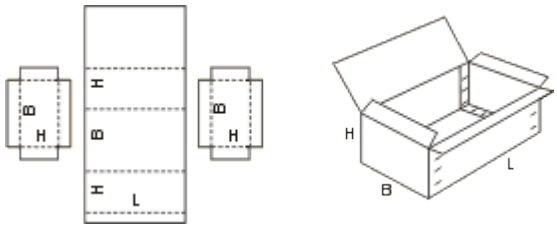

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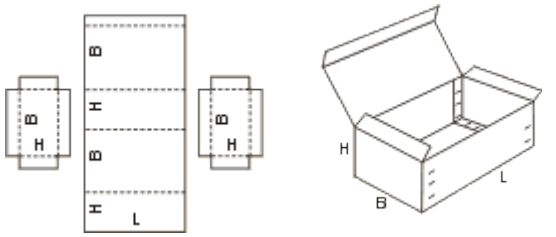

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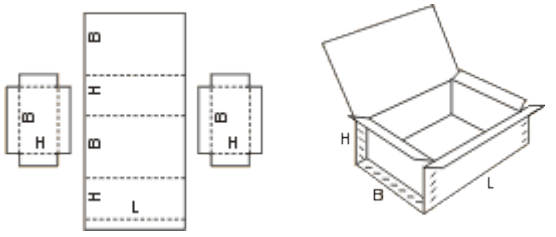

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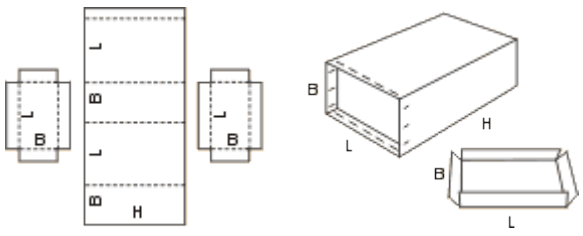

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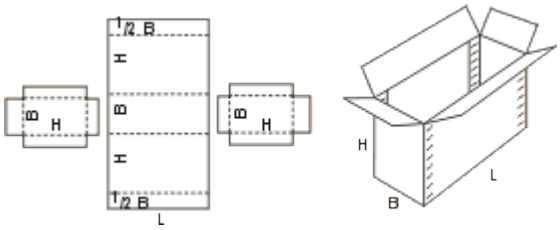

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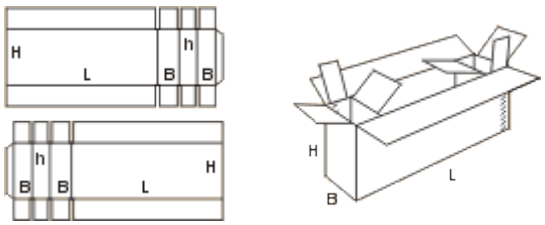
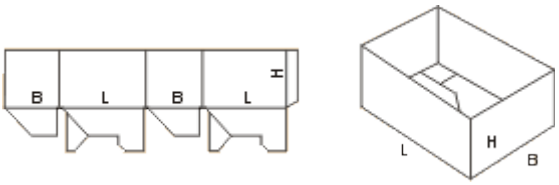


Complex-cut corrugated cases (codes 07xx)

0700



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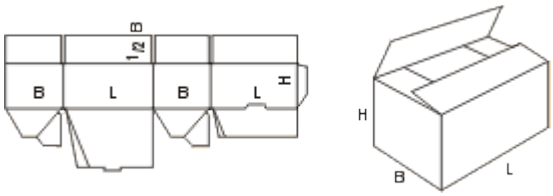

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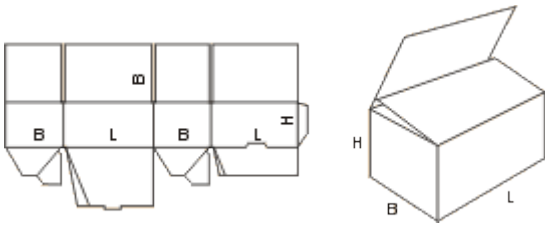

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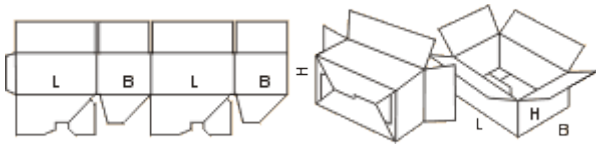

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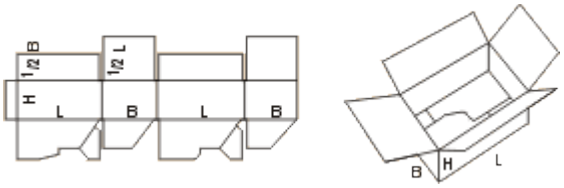

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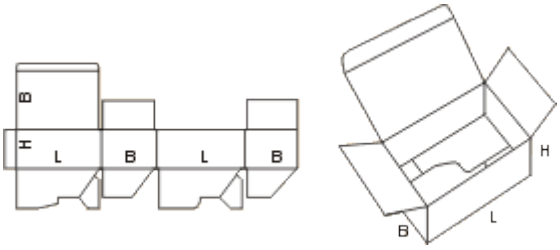

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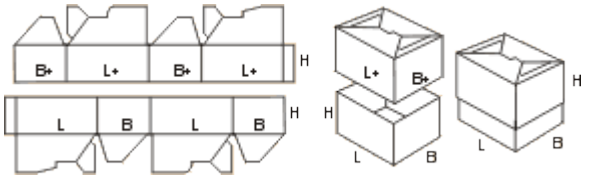

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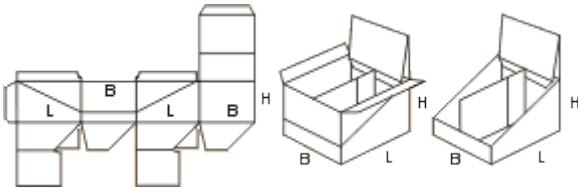

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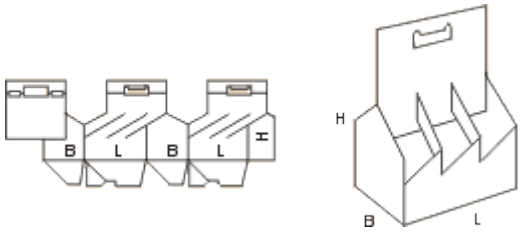

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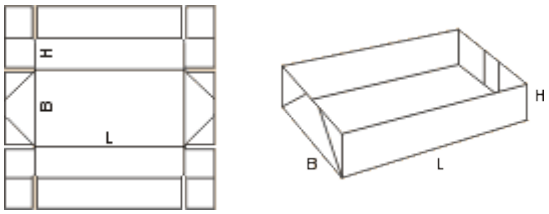

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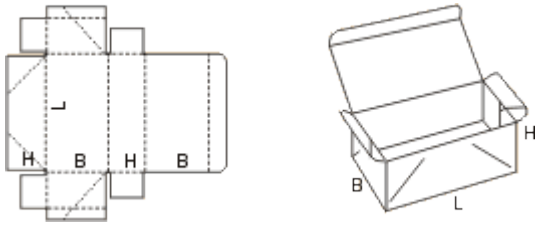

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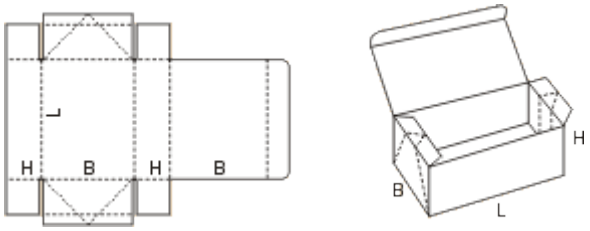

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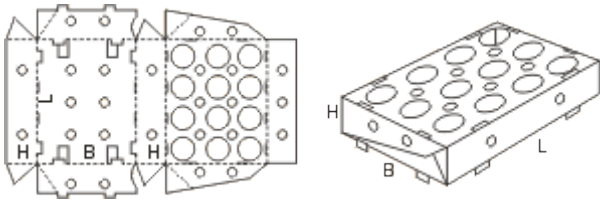

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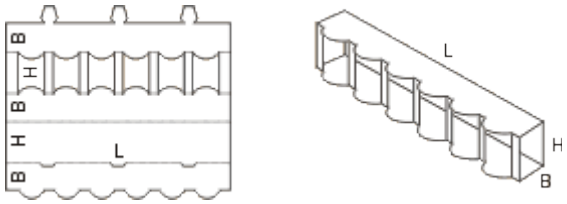

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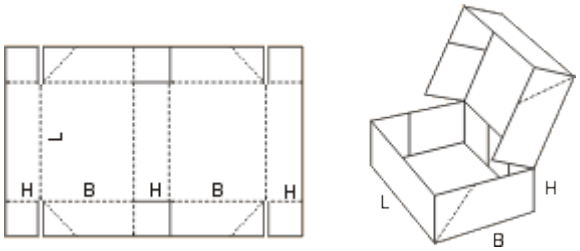

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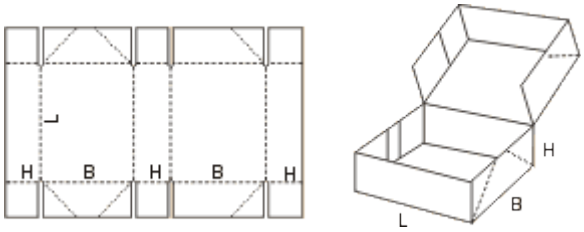

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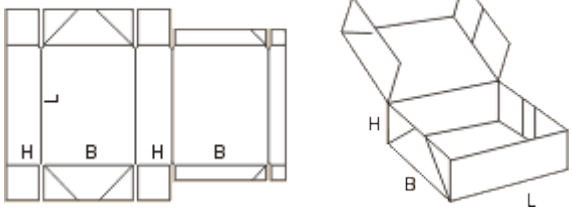

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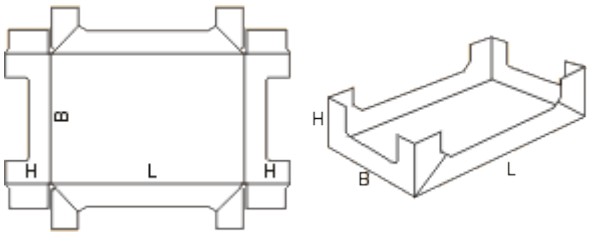

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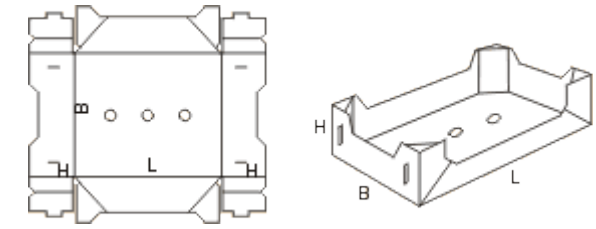

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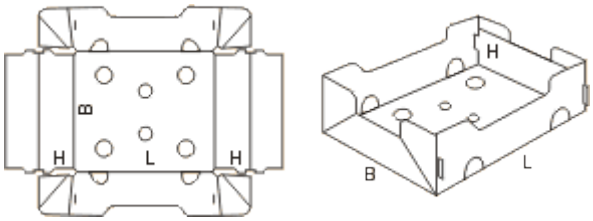

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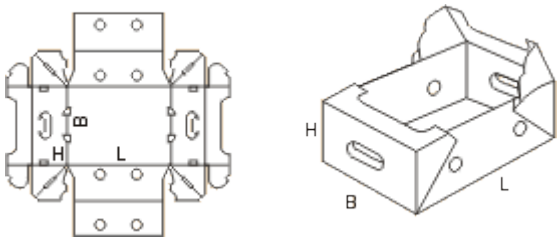

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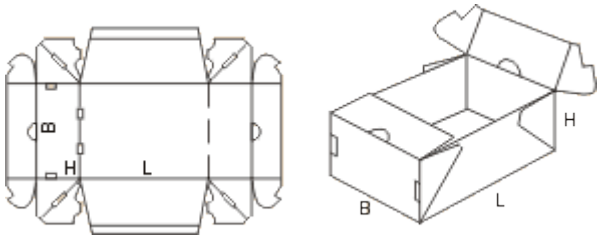

Complex-cut corrugated cases (codes 09xx)