



The sense of
creasing...

01

Creasing is a process which
may be similar to embossing



02

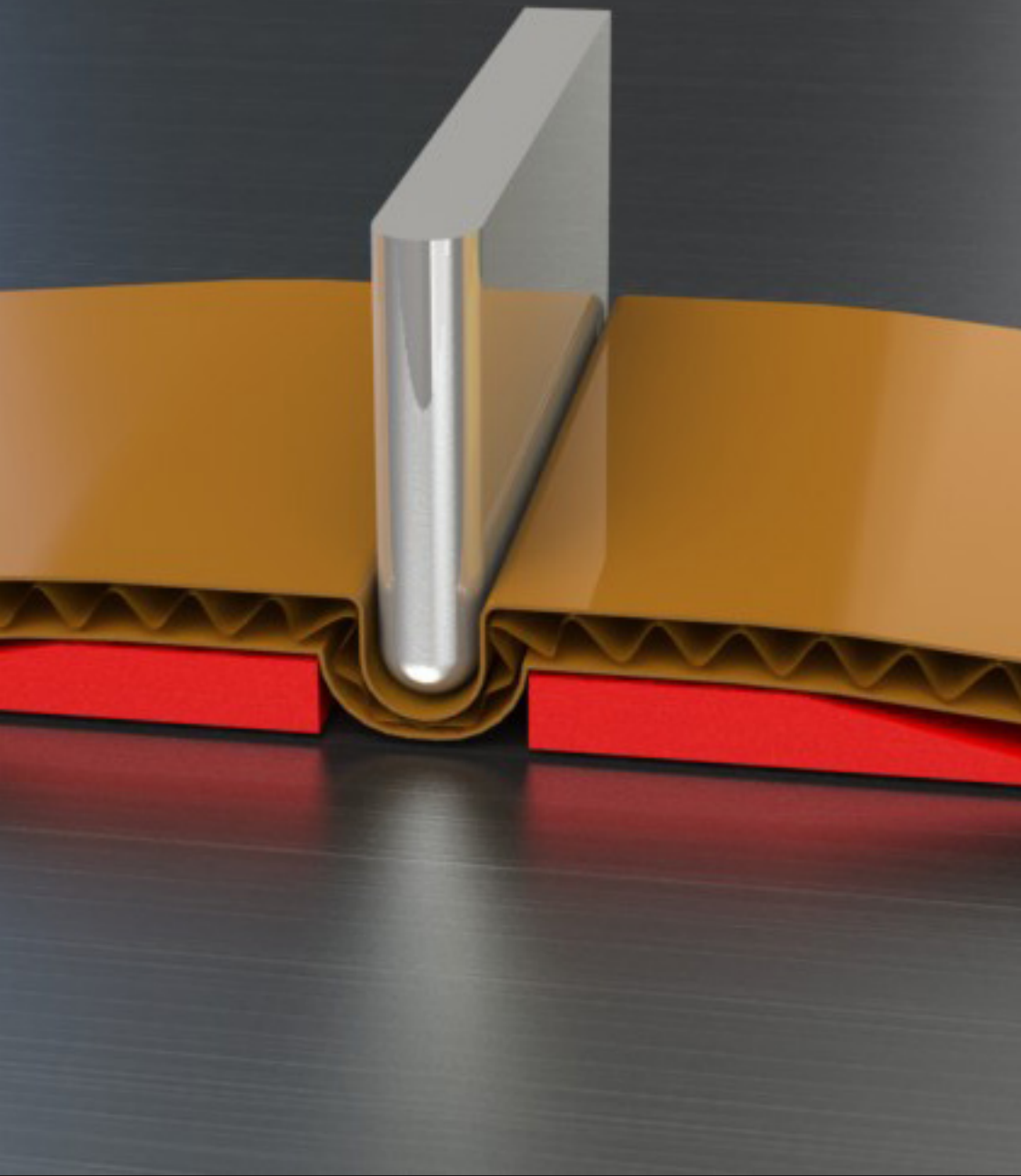
Creasing is the process which may be similar to embossing (to produce relief in the cardboard). Still, it is indeed a transmission of a mark along the area to be folded and a delamination process. Creasing allows the box, once folded, to have a creasing bead along any fold which is like a column and ensures the package can resist more weight/force without cracking.

The sense of creasing...

#talkingaboutdies

Matrix





The process of creasing...

The creasing rules press the board into the creasing channel. The bevel of the channels adjusts the cardboard, while the rules stretch it producing, in certain cardboards, delamination whilst others, just the creasing bead.

04

Ways to crease

PRESSPAN (Pressboard)

METAL BASE MATRIX

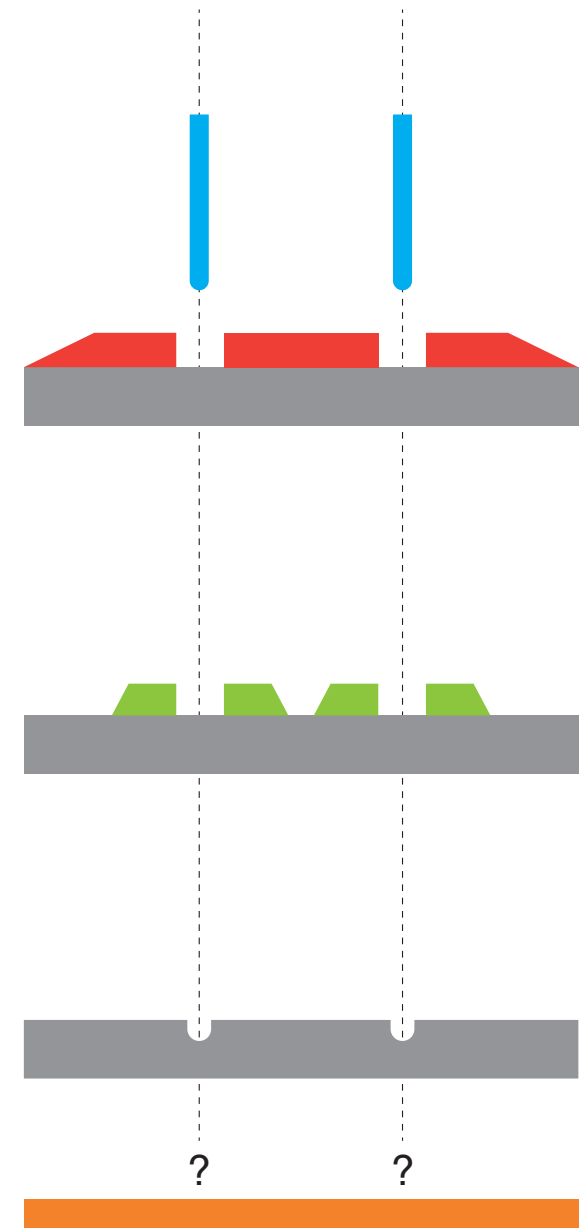
CREASING MATRIX WITH FOIL BASE

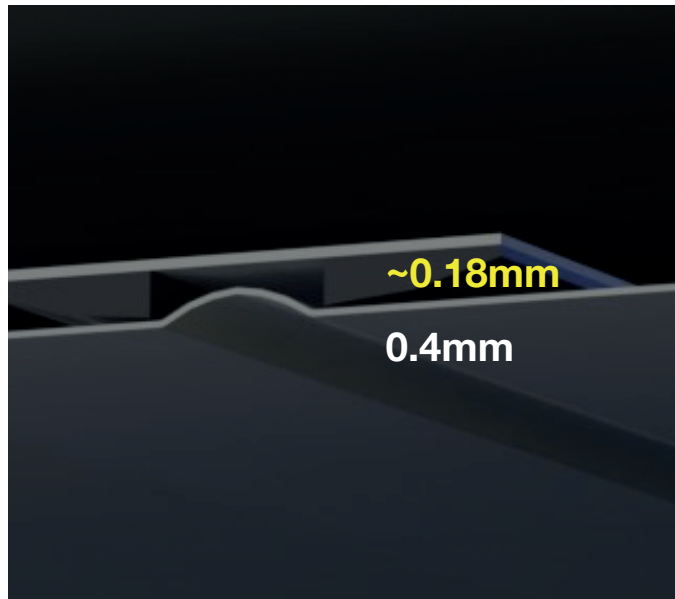
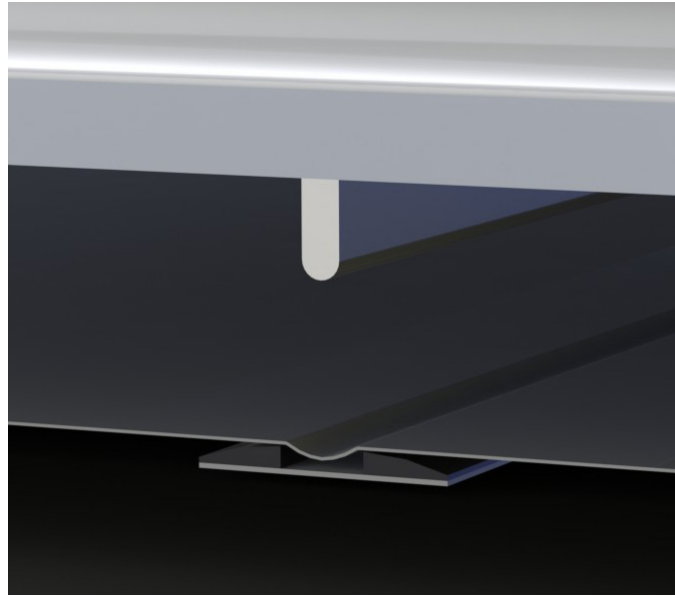
PERTINAX or Vetronit or Softinax

STEEL COUNTER PLATE

TOMORROWS FUTURE ???

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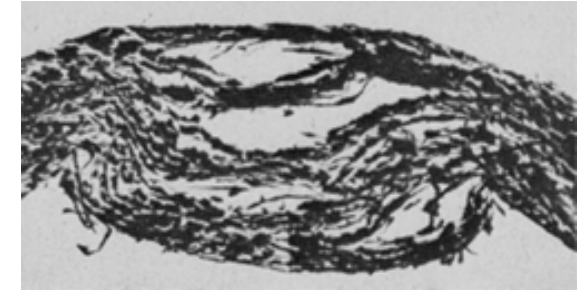
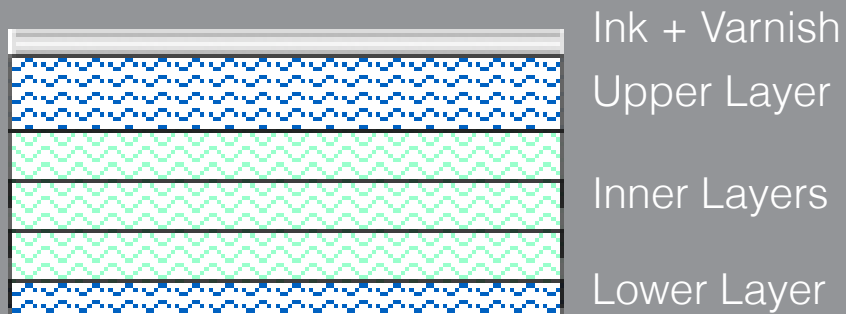


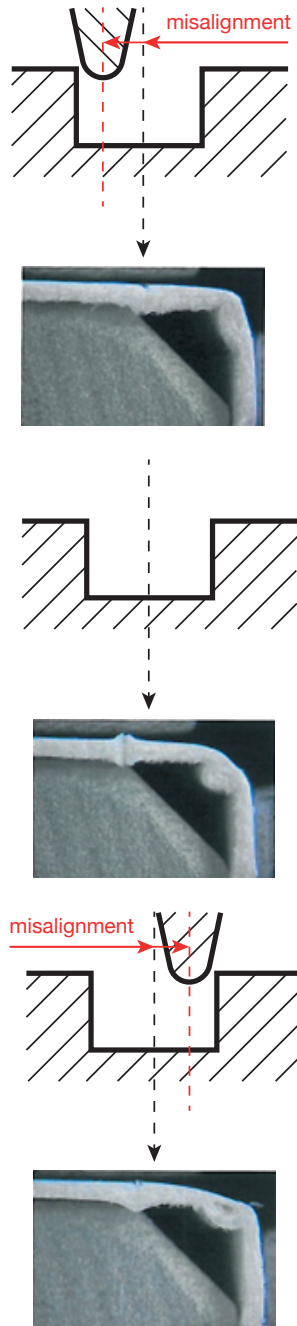


Independent of the formulas you choose for a 'perfect crease', the creasing bead will reach a height which should be 0.18mm over the surface of the board. Most of 50% of the creasing worldwide do not get this height. After days and weeks, this value decreases, causing a 'bad crease', which may influence the size of the box and the right / vertical styling.

The effect of creasing...

The creasing rule presses the cardboard producing an embossing at the same time as stretching the cardboard, forcing the layers of the carton to be spliced.



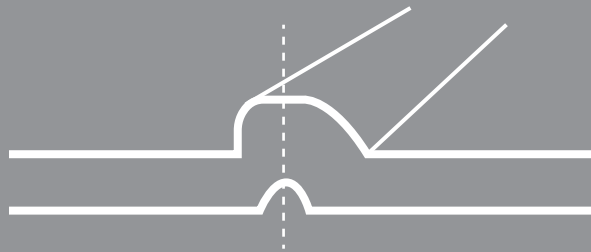


The importance of centring...

If the creasing channel is not centred in respect of the creasing rule head, the creasing bead is produced off-centre, changing the geometry and stopping the box from remaining straight.

08

Other reasons for the off-centring



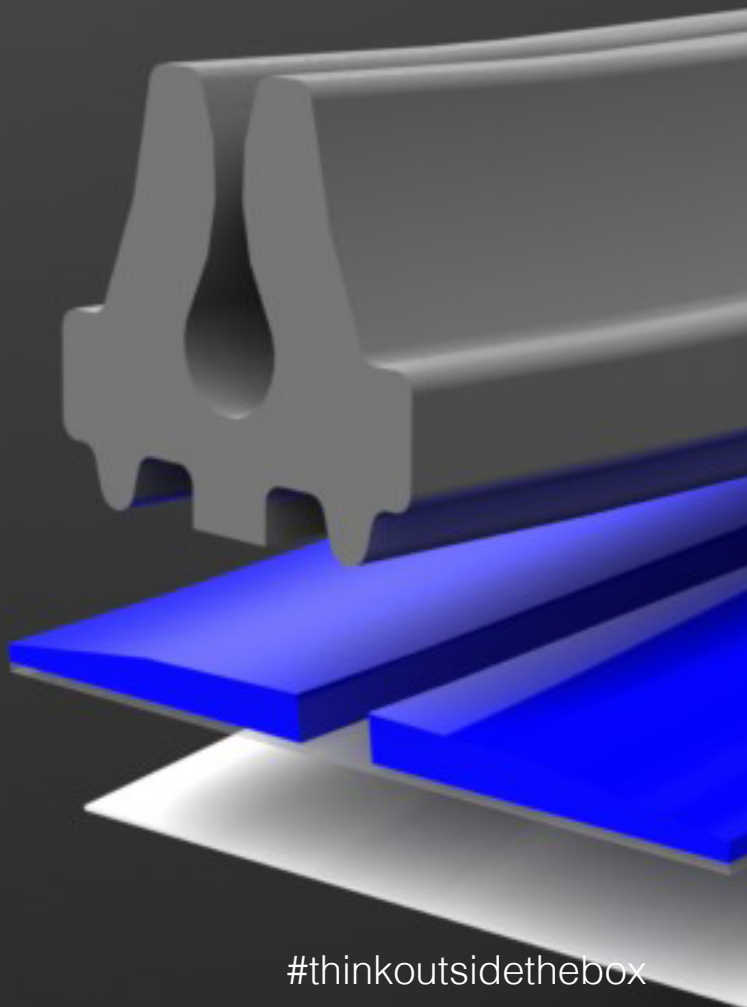
What other reasons may cause the creasing bead to be off-centre?

The 'locator', responsible for the register between creasing rule and matrix is not perfect

The die may loose moisture and shrink

The creasing rules are not 100% vertical (90° to the plywood)

The adhesive may move, mostly because of higher temperature



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Traditional & New Formulas

The New Formulas consider the compressibility of the cardboard. Sometimes it is 25%, but depending on the cardboard, they may vary between 5% and 36% of the original thickness. Also different is the consideration of;

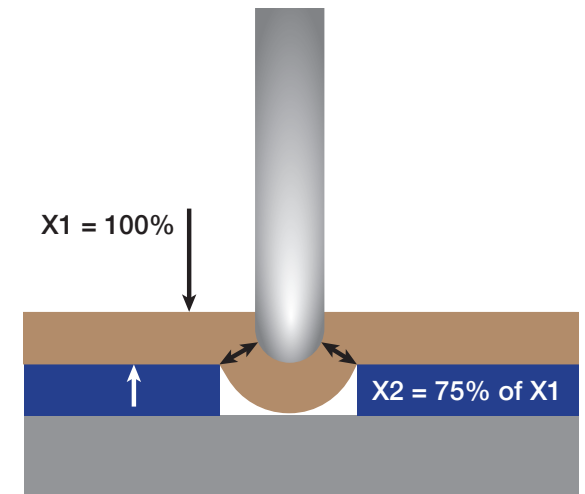
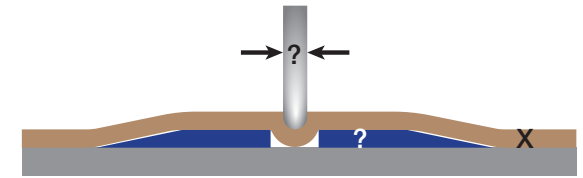
- Folding will be 180° or 90°
- The smaller and deeper the crease, the better the folding process

Traditional & New Formulas

What is the ideal creasing rule and creasing matrix for each cardboard?

Most of the formulas used worldwide were developed over 40 years ago, based on the knowledge and the 'European' cardboard at that time.

The old global formula suggests to multiply the cardboard thickness 'X1' by 1.5, which means the cardboard becomes compressed by 75% of the original thickness in the closest contact between creasing rule head and channel edge.





a



b



c

Traditional & New Formulas

The deeper the crease, the better the folding process.

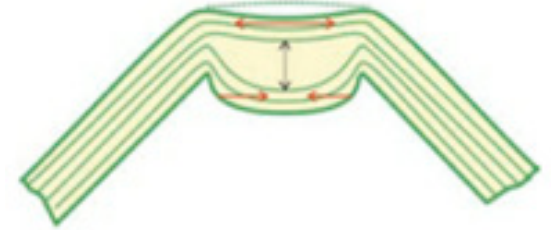
- a) IDEAL creasing bead, correct channel size
- b) Channel too wide
- c) Too deep and narrow channel (the cardboard cracks)

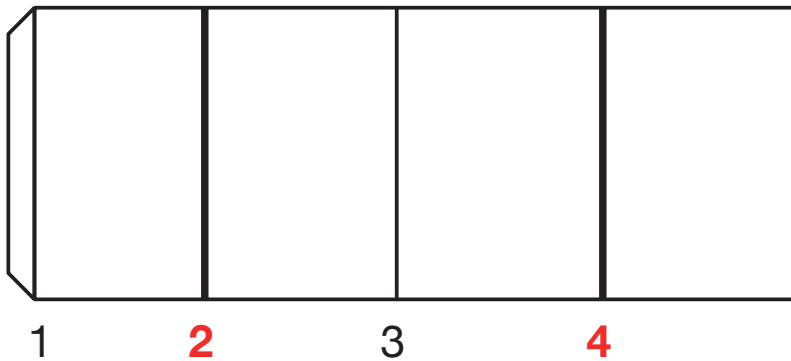
90° vs 180° creases + folds

90° fold: The cardboard becomes stretched outside and compressed inside of the box, becoming delaminated and offers a 'bead', which gives the box the stability.

180° fold: The creasing bead offers a strong resistance, as it interferes in the 180° folding process. Because of that, the 'bigger' the creasing bead, the higher the resistance of the cardboard to be folded to 180°. This process causes folding gluers, and later the automatic packing machines to work slower, as the glue must dry to keep the box closed.

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Creasing line #1 & #3 => 90°

Creasing line #2 & #4 => 180°

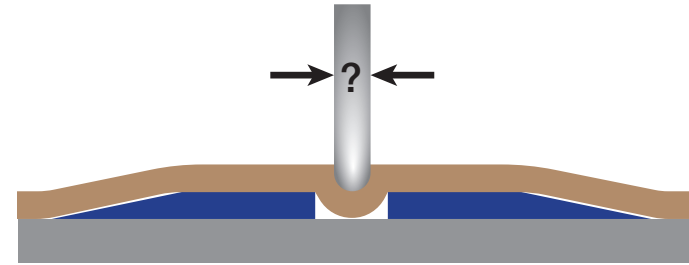
Creases for 90° and 180° fold

At minimum the crease, which will later be folded up to 180°, must be creased with the following *new formula* instead of the one used for a 90° fold.

New Formulas

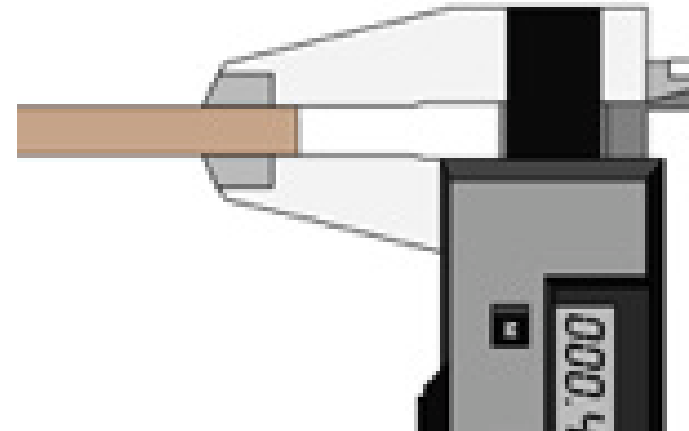
1. The original thickness of the board or substrate 'X1', this is to determine:

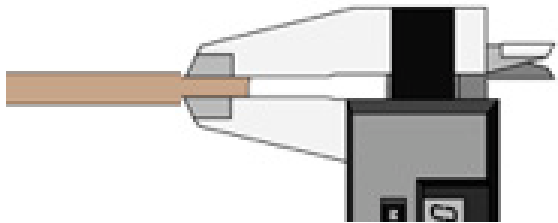
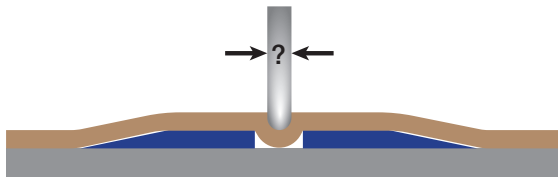
- The height of the creasing rule
- The width of the creasing head
- The depth of the channel



Width of creasing head in mm

0.25	0.35	0.36	0.50
0.53	0.71	1.05	1.42
2.10	2.84		





New Formulas

2. The compressed thickness of the board, by pushing the digital calliper with the fingers with maximum force to determine the thickness 'X2'

This is to determine:

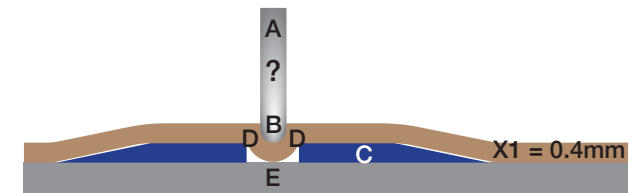
d) X2, multiply by 2 (2 times = on each part of the creasing rule)

e) $(X2 \times 2) + B =$ The width of the channel

New Formulas

The ideal formula for solid cardboard?

A) Creasing rule height	$23.80 - X1 // 23.80 - 0.4 = 23.40$ mm
B) Head width creasing rule	$\geq X1 \Rightarrow 0.40 - 0.50$ mm = 1.5 pt.
C) Depth of channel	$X1 \Rightarrow 0.40$ to 0.45 (if kraft-cardboard, better if 0.5 mm)
D) i.e 0.28mm	$.28 \times 2 = 0.56$ mm
E) Width of channel	$B + D = 0.5 + 0.56 = 1.10$ mm



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