hanatek

Carton Crease Proofer

INSTRUCTION MANUAL

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Introducing your new Hanatek Carton Board Creaser

This manual should be read in conjunction with BS 4818 : 1972
which specifies a method for the determination of the creasing quality of carton board. The determination is made on specimens that have been creased under standard conditions. The creased specimen is folded and then compared in appearance with photographs showing typical faults. The objective of this standard test is to find, at a set crease depth, the minimum and maximum widths of groove that give visually acceptable folds.

The thickness of creasing rule, and the depth and width of the crease impression can be altered in the investigation of production folding problems.

Identifying the Parts

When the instrument is unpacked it should be placed on a stout bench. The upper chase holds the three creasing rules while the lower one contains the corresponding creasing grooves. The upper chase is fixed to the press beam by three bolts.

The press is operated by the handle on the right hand side and, at its lowest position, the dial gauge on the upper chase indicates the set depth of crease. The crease depth is altered by turning the hexagonal screw above the press beam. The following sections deal with the meanings of the dial gauge graduations.

Two sets of creasing rules of thickness, 2 and 3 point (point 4 is an option) are provided as standard for the upper chase.

The creasing grooves are in the lower chase. Thirteen measuring grooves are provided. The numbers give the width of the groove in steps of 0.1 mm for a range of 1.0 to 2.2 mm

WARNING-MOVING PARTS WITH PINCHING RISKS

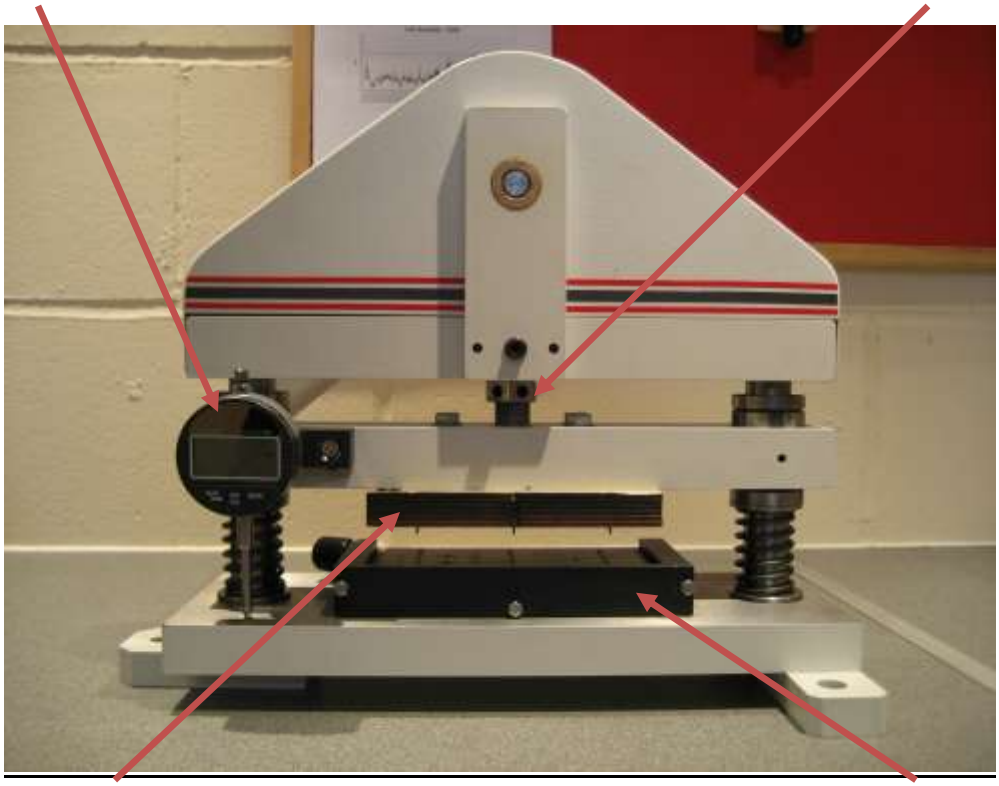
To avoid the risk of trapped or damaged fingers the Carton Crease Proofer should only be operated as outlined in this manual.

When turning the handle to produce a crease, the free hand should be kept well clear of all moving parts.

Fixing holes are provided in the press base so that it can be secured to a bench, making it unnecessary to hold the press manually during the creasing stroke.

Digital Dial Gauge

Hex screw

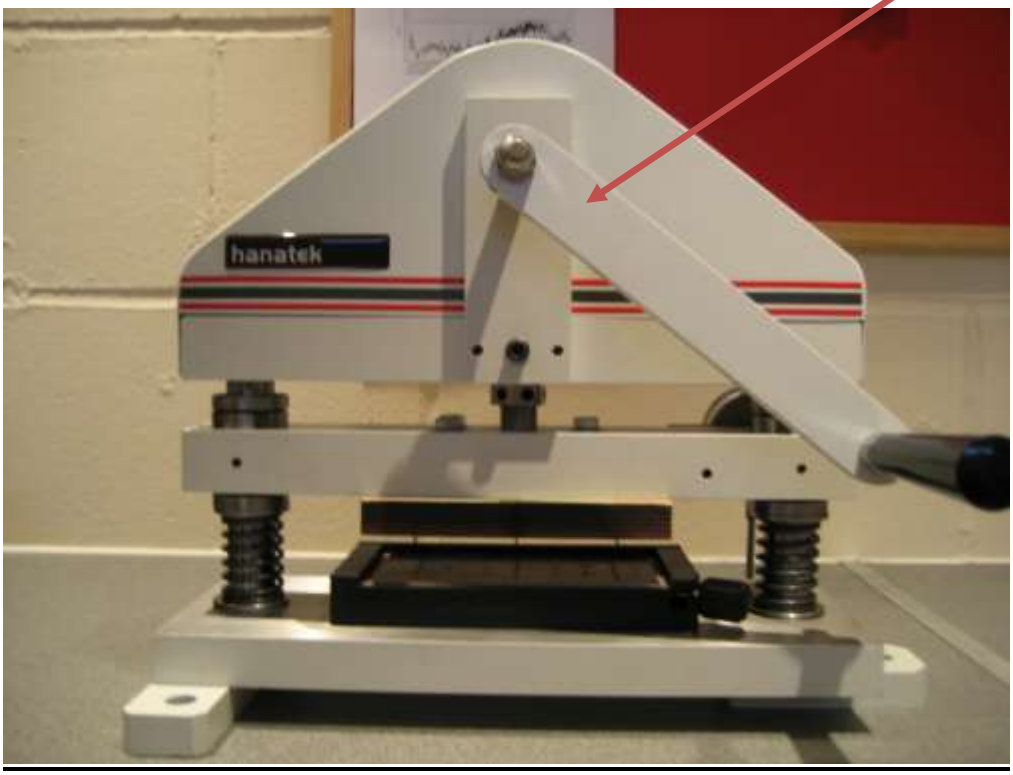


Upper chase

Front View

Lower chase

Handle

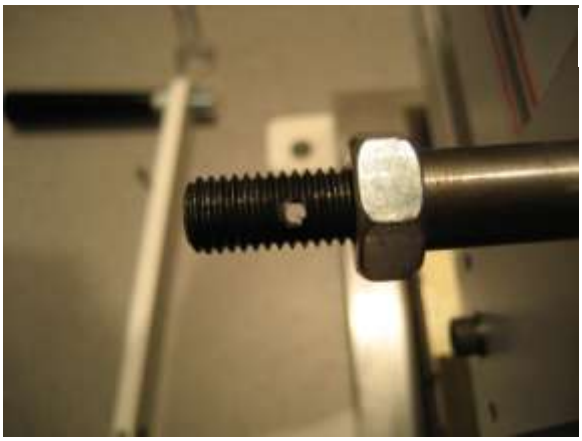


Rear View

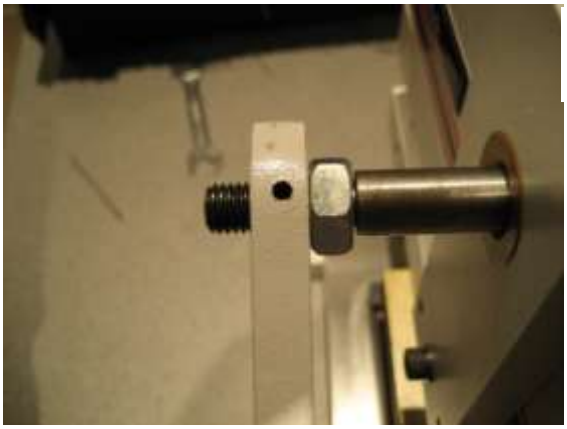
Assembly Instructions

The handle has been removed to prevent damage during transportation.

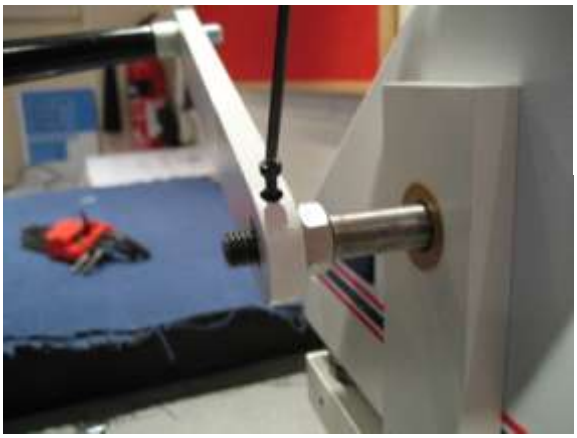
To re-assemble:-



- Find the location hole on the spindle



- Wind the handle on to the spindle until the holes line up.



- Push the locking bolt through in the largest size hole.
- Tighten with a hexagon key.

- Tighten the two nuts with a 17mm spanner.
- Tighten the locking bolt with a 2mm hexagon key until it is slightly flush as shown.

- When the handle is perpendicular to the upper and lower chase, the grooves are at their lowest position.

Setting Up

The proofer should be set up with rules and grooves appropriate to the board thickness.
For quality control, these can be standardised, and suggested settings are shown in Table 1, taken from BS 4818 : 1972.

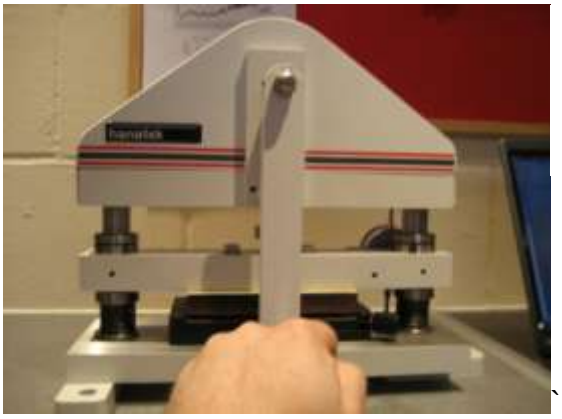
Here the distance between creases is 50 mm.

Table 1 – Instrument Settings

Board Thickness Range	Width of Rule		Depth of Crease; Dial Gauge setting
um	Pt	mm	Um
350 to 460	2	0.71	0
470 to 560	2	0.71	-50
570 to 870	3	1.07	-130
880 to 1020	4	1.42	-180

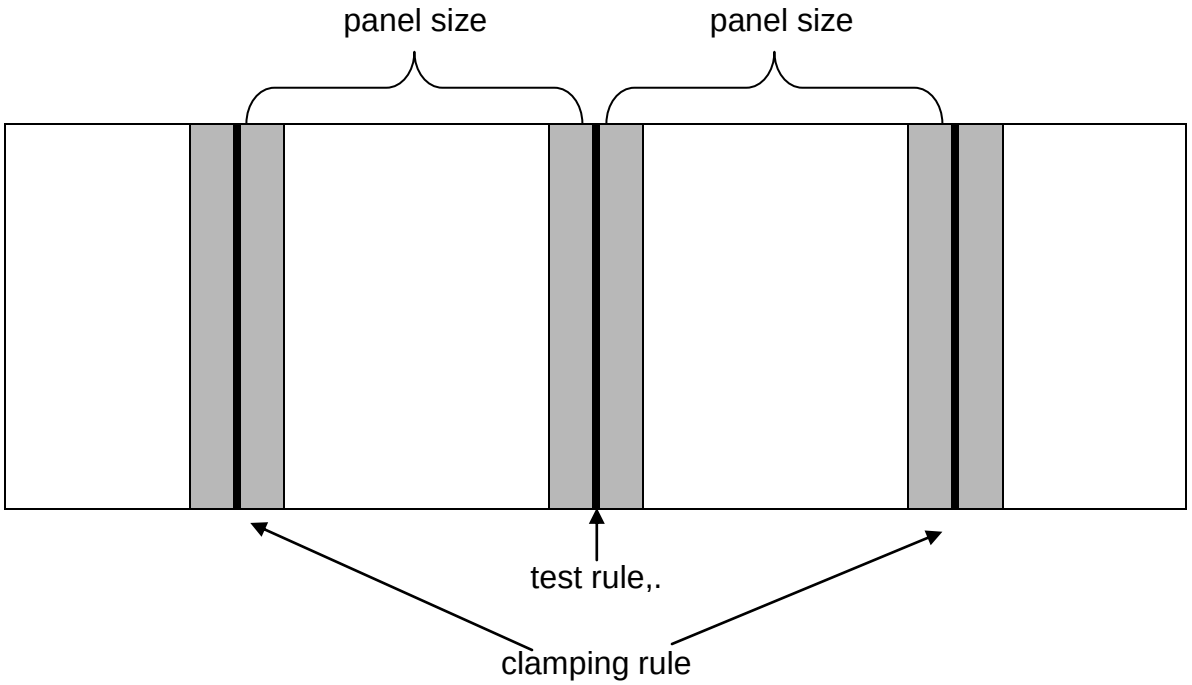
Note the way these standard settings change with the board thickness range. The following sections explain how these settings are achieved.

Inserting/Changing the Creasing Rules



- Place a piece of carton board over the lower platen to avoid damage to either rules or grooves.
- Turn the handle to its lowest position.

- Place the square safety block between the fixed beam and upper chase.
- Release the Handle.
- Undo the three hexagonal bolts with a 14mm spanner.
- Replace the creasing rule as required.
- Replace the hexagonal bolts to fix the new creasing rule.
- Turn the handle to its lowest position and remove the safety block.



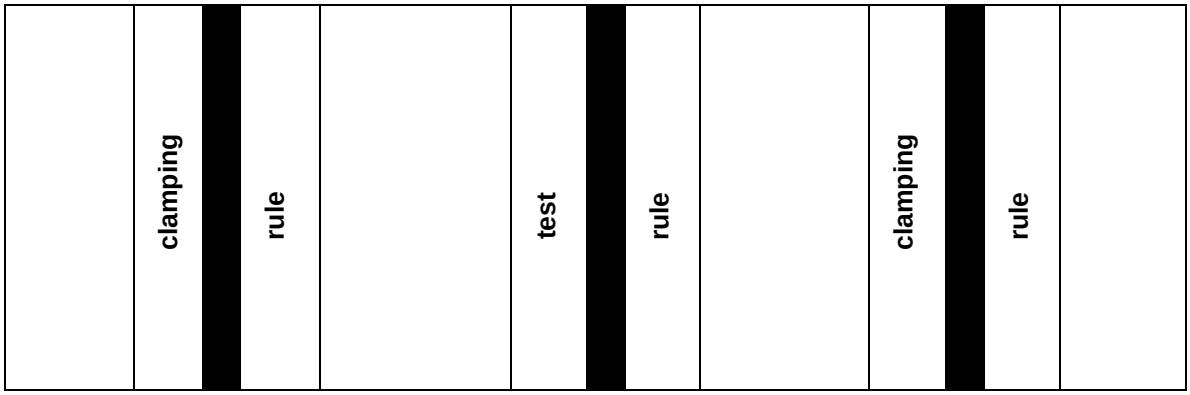
Using Bespoke Size Rules and Grooves.

The instrument is supplied with Hanatek standard rules and grooves which produce 50mm panels. This layout is perfect for comparative board testing and quality control.

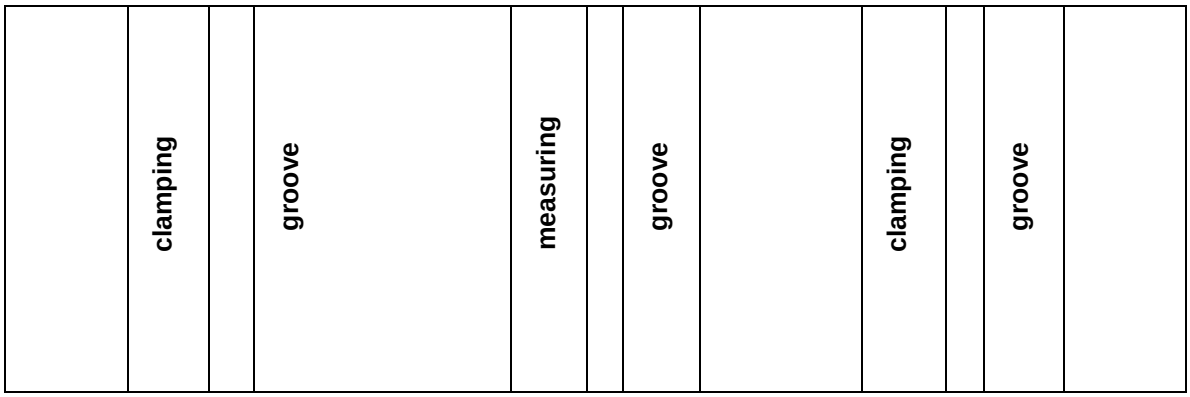
Hanatek also supply bespoke rule and groove sets with panel sizes from 12.6mm up to 82mm.

The use of narrow bespoke panels is useful for predicting cracking during the manufacturing of small cartons. Please contact us for more details of these tests and the price of alternative rules and grooves.

UPPER CHASE



LOWER CHASE



Changing the Width of Groove

The tester is provided with a series of grooves machined to the dimensions shown on table 2.
To change the grove platen used, unscrew the knob on the corner of the platen mounting area and slide out the platen. Replace with the required platen and retighten the screw.
Rotate the handle to ensure the instrument is Zeroed in the correct position **(see Zeroing the Carton Crease Proofer)**.

Table 2 – Groove Widths

Groove Width (mm)	**Groove Width (mm)**
1.00	1.70
1.10	1.80
1.20	1.90
1.30	2.00
1.40	2.10
1.50	2.20
1.60	

Zeroing the Carton Crease Proofer

Diagram A shows the crease rules in the Zero position, the proofer should be set up so that it this is achieved when the handle is in the down position.

To adjust the Zero position turn the handle down so the rules are at their lowest point. Observe the position of the rules; they should be parallel with the top of the groove platen (as in diagram A).

Impression depth is altered by rotation of the hexagonal screw on the moving beam with the either a 22mm spanner or by inserting a suitably sized screw driver in the holes and turning.

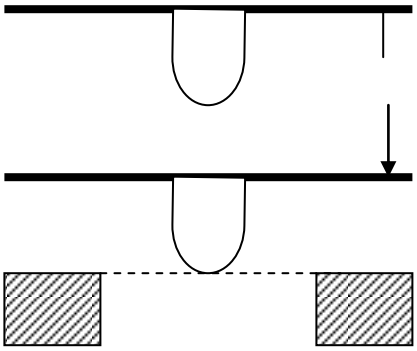
Anti-clockwise rotation of the screw will increase the depth of crease. This adjustment is made most easily with the moving beam in the raised position.

Once the grooves are seen to be in the correct position the “Zero” button should

be pressed on the digital dial gauge.

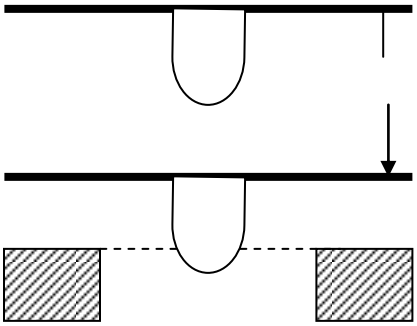
To check that the instrument has been zeroed in the correct position, turn the handle slowly through a complete revolution. The display should only show a negative or “0.00” value.
If a positive value is observed the “Zero” button should be pressed as this is the lowest position for the rules.

A Upper Chase



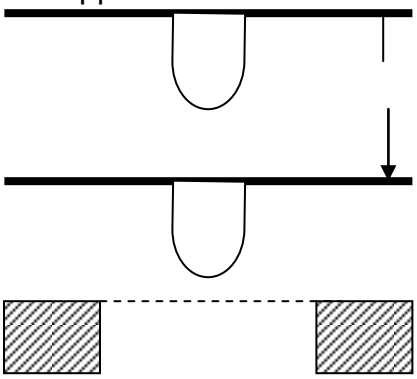
A- Zero Position
The digital dial Gauge reads 0.00

B Upper Chase



B- Making a Crease
The digital dial Gauge shows a positive value

C Upper Chase



C- UP Position
The digital dial Gauge reads a negative value.

This diagram shows at A, the upper chase being lowered so that the tip of the rule comes level with the groove surface and a dial gauge reading of zero occurs. A positive depth reading , as in diagram B, corresponds to entry of the rule into the groove and a negative one, as in diagram C, to the rule being above the groove surface at the lowest position of the chase.

The depth of crease should be checked finally with the correct grooves in place and a sample strip of board resting on them as the pressure of creasing can cause alteration of the reading from that with no board.

Take care at all times that the crease depth is not excessive to cause the rules to contact the base of a groove. Furthermore, when checking the dial gauge setting, ensure that the rules are not damaged by forcing them against the groove plates.

The dail gauge setting should be checked every time that the upper chase is replaced and after a change of creasing rules.

Making a Creasing Test

Specimen Preparation

The way a test is made depends to some extent on what use is made of the results obtained. If, for example, one wishes to keep a check of the quality of board over a period, then the board must be conditioned to standard conditions, say 50% R.H. AND 23° C. Changes in board moisture content affect the folding and cracking behaviour of carton boards. If, on the other hand, one wishes to predict cutting and creasing press settings, then the sample should be in the printed and varnished state as the press operator will receive it. Whichever way is used, the board should be cut into strips up to 200 mm long and 50 mm wide for ‘across-grain’ folds and 73 mm wide for ‘along grain’ folds. This width difference will help to equalise the creasing pressures for the two grain directions.

Across grain folds are those where the creasing rule is at right angles to the machine direction of the board. These can be called MD folds. Along grain or CD folds are produced when the creasing rule is parallel to the machine direction.

As the machine direction of board is 2 or more times stiffer than the cross direction, flexing of the sheet of board or carton by hand should readily enable the machine direction of a sample to be identified.

Cut sufficient test strips in both grain directions to enable say 10 tests in each direction to be made. Strips must be longer than the distance between the clamping grooves, but shorter than the distance between the beam guideposts.

The Test Procedure

The following procedure applies to all creasing tests, but the crease depth and rule spacing can be altered in particular circumstances. For quality control the settings are standardised and tabulated. The distance between creases is 50 mm. Where it is desired to simulate production press settings, the crease depth can be arrived at from the cutting and creasing rule heights and thickness of make-ready by means of the following formula.

$$D - m - (H - h)$$

D = dial gauge reading
m = make-ready thickness
H = cutting rule height
h = creasing rule height

Numerical information can usually be obtained from the forme and press room staff of converters.

With the press set and test strips cut, the following procedure is followed:-

a) Insert a measuring groove into the Hanatek Carton Board Creaser. A groove width equal to the clamping groove width could be chosen as a starting point.

b) Insert the board strip with the printed or liner side towards the creasing rules.

c) Make a crease by moving the press handle smartly between its extreme positions, without any dwell midway.

Creases can be made with either a forward or a backward stroke.

CAUTION:- Keep your left hand out of the gap between the moving and stationary parts of the press whilst making this creasing stroke.

Fixing holes are provided in the press base so that it can be secured to a bench, making it unnecessary to hold the press manually during the creasing stroke.

d) Remove the creased strip and examine carefully before and after folding.

e) If the folds are satisfactory, proceed using both wider and narrower grooves than the initial choice until faults appear.

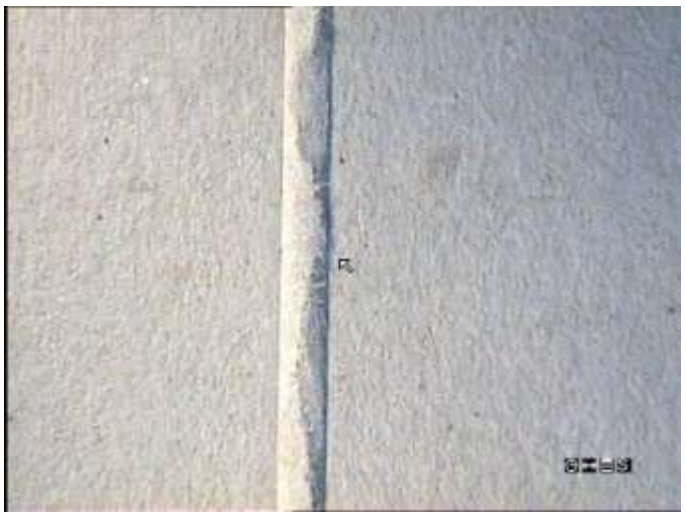
f) If the folds show either cracking of the back or liner or a pressure ridge, proceed using wider grooves. If the folds show a crumpled rib, proceed using narrower grooves.

g) The object of the test is to find the narrowest groove which avoids the faults illustrated in pictures i, ii and iii and the widest groove that avoids the faults shown in pictures iv and v. Groove widths less than the rule thickness plus the board caliper should be used with care as they are unrealistic and can cause excessive pressure to be applied.

   Record your assessement of the minimum and maximum groove widths for satisfactory folds and the nature of the faults which limit this range.

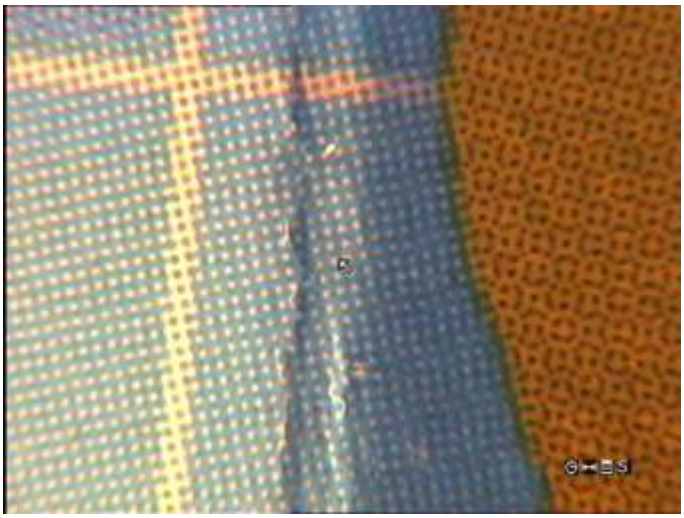
Picture 1

View of the back of the sample showing back of board cracks.



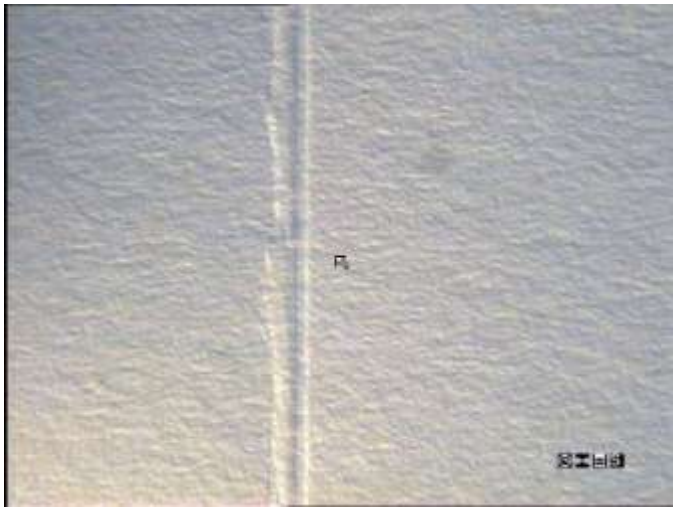
Picture 2

View of the front of the sample showing liner cracks – these are hair-line cracks parallel to the fold direction which appear after folding .



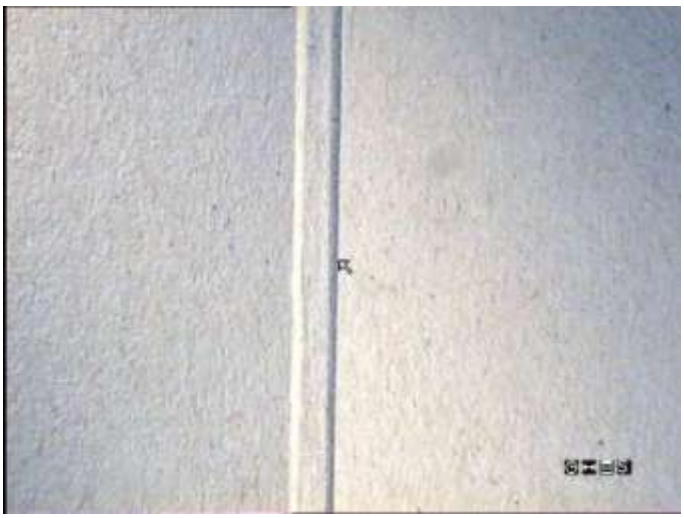
Picture 3

View of the rear of the sample after folding showing pressure ridges.



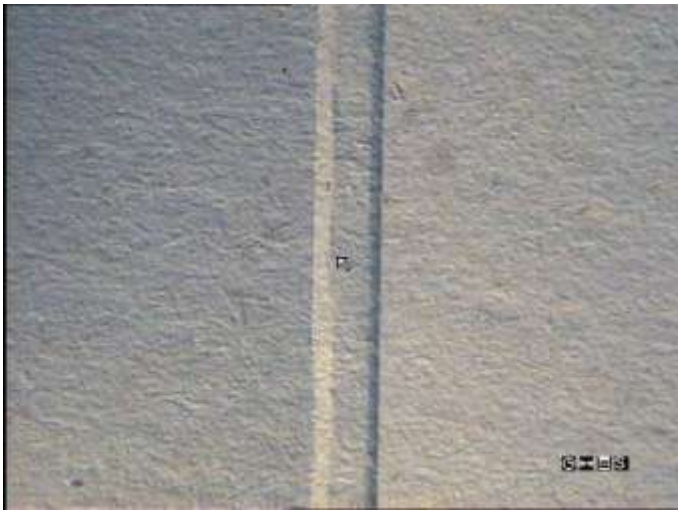
Picture 4

View of the rear of the board after folding showing crumpling of the rib parallel with the grain direction (CD crease).



Picture 5

View of the rear of the board after folding showing crumpling of the rib perpendicular to the grain direction (MD crease).



Reporting

The test report should include the following information:

a) Identification of the sample, including whether printed or plain
b) Sample thickness
c) Widths of creasing rule
d) Rule separation
e) Crease depth
f) State of sample (as taken or conditioned)
g) Minimum and maximum groove widths, avoiding the faults illustrated. The identification ‘across grain’ should be used for crease made at right angles to the machine direction of the board and ‘along grain’ for creases made parallel to the machine direction of the Board.
h) The types of fault to which the particular board sample is prone.

Interpretation of the Results

The creasing range found gives a direct indication of the quality of a board for carton creasing. The wider the range, the better the board. In view of the many variations in carton size, cutting and creasing presses, make-ready materials and boards, it is impossible to lay down rules for what range is acceptable for different grades of board in this test.

The full benefit from a new test such as this will only come when the user relates the results obtained with the performance of the boards on his own converting equipment. The board mill without converting equipment can seek reports from purchasers of the deliveries tested to build up this background knowledge.

When a carton maker wishes to use the creaser with the correct make-ready settings, again the link between test results and practice is necessary. The tester uses steel grooves, while softer materials are frequently used in make-ready. However, a dial gauge setting can be found that will be appropriate to the particular combination of rules and make-ready material the converter chooses to use.

Particular attention should be paid to the difference in the crease conditions, which the tester reveals as necessary for the two-grain directions. Frequently, in carton problems, the results will show how ‘along grain’ creases at carton flaps can be improved.

Besides its use in board quality control, the Hanatek Carton Board Creaser can be used in the study of other board problems. For example, a carton for machine packing may require creases, which have less than a certain resistance to folding. Creases made on the Hanatek instrument can be tested on the Hanatek Crease Stiffness Tester as this can identify what fold resistance are possible within the creasing limitations of the board.

Maintenance

When installed, the tester should be protected from excessively moist atmospheres and dust. A light coating of oil on black treated metal parts will assist in preventing rusting.

Oil holes are provided in the cover and upper bearings. These points and the guide pillars should be oiled occasionally with light machine oil.

Do not oil the projecting shaft of the dial gauge.

Technical Enquiries

Our Technical Services staff at Hanatek would be pleased to assist users with technical enquiries on the application of this and other carton test equipment developed through our project research.