PTS
FIBRE based solutions

papermorphosis®

highly engineered paper

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INNOVATIVE TECHNOLOGIES FOR HIGHLY STRETCHABLE PAPERS AND A NOVEL LONGITUDINAL CORRUGATE

Stretch in paper – what exists today?

- Sack papers, produced by so-called "extensible units" (stretch only in MD, the 7-8% in CD derive from raw material, refining and drying)

- FiberForm by our licensee Billerudkorsnas (10% CD, 15% MD) out of our "Mould Paper-Technologie" and its applications

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Our new development

It should be possible to tailor separately on demand both elongation in cross direction (CD) as also in logitudinal direction (MD), starting by even only 2% more on top of what a paper already has

2 units

1 **CD**-unit – 1 **MD**-unit

For papers lacking in performance, when virgin fiber or high refining are not available.

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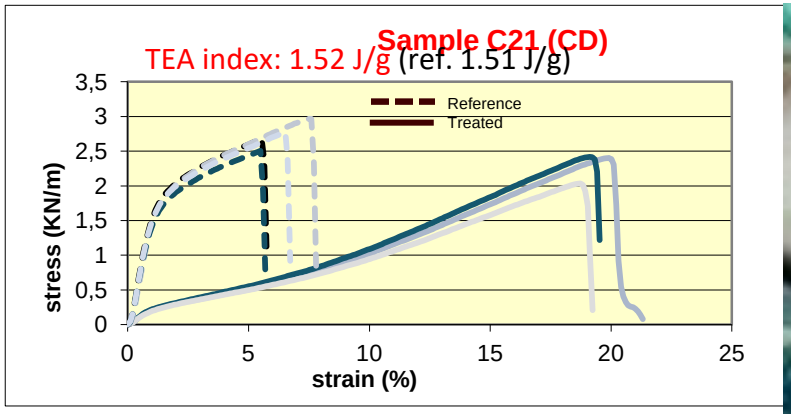
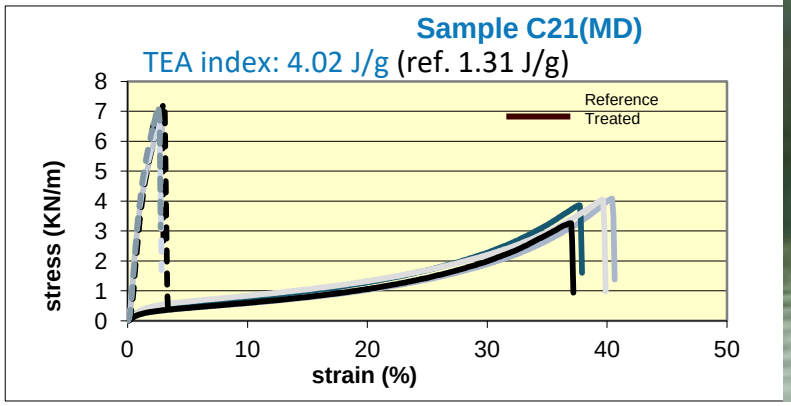
p a p e r m o r p h o s i s®

- CD-stretch on demand from 2% upwards
- MD-stretch on demand from 2% upwards
- Tailor-made combination of CD and MD-stretch, also symmetrical(6/6%, 10/10% 14/14%, 25/25% etc)
- Increased trim width(2,3,4%) and stiffness in CD by pre-enlarging the fibrous web
- Tissue and tissue-like materials
- New papers for taditional flute
- Novel longitudinal corrugate

What can be achieved?





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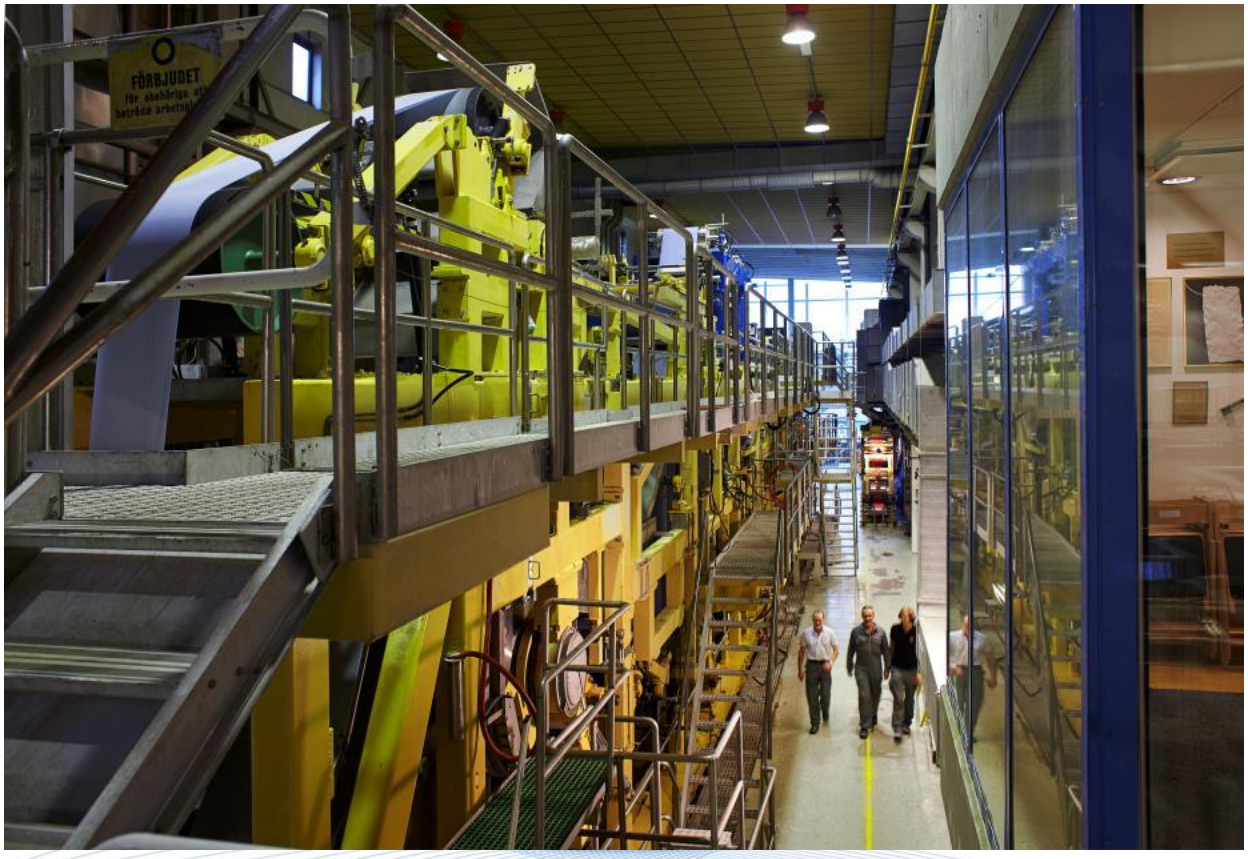
Installation of the units

The XXL- and XXBELT-units are installed at the paper pilot facility RISE Bioeconomy Stockholm/Sweden between the press and drying section



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the UNITS at RISE/Stockholm

use of the standard available width (240 mm).

Different paper grades can be produced and then treated on the units

Stretch on demand can be tuned according to product needs

CD – unit

Operated at about 40% dry content

MD – unit

Operated at 65-85% dry content

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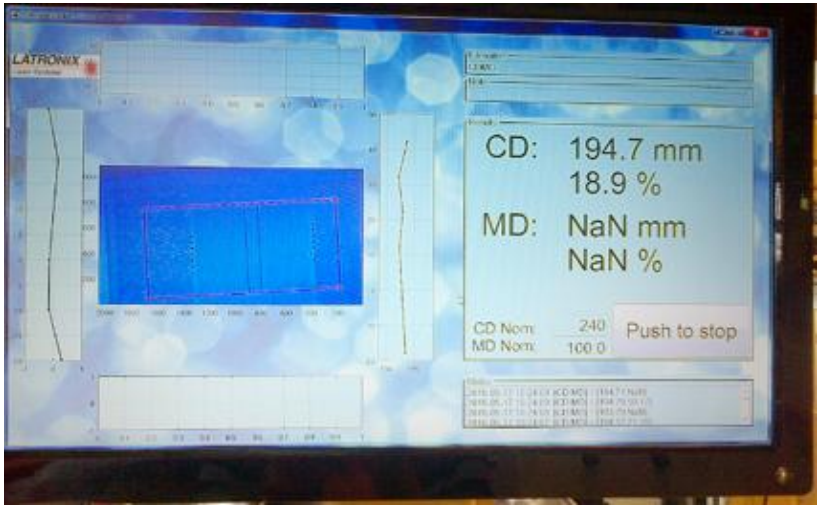
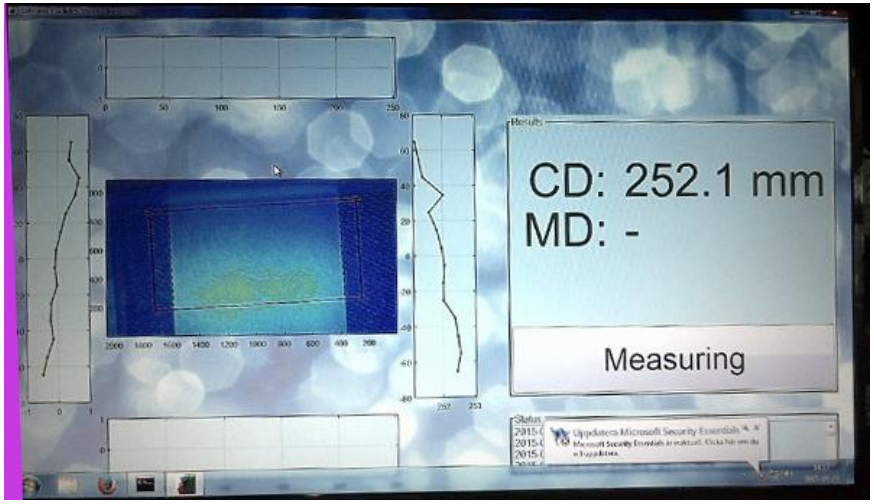
A look on the CD unit

XXL-Mode: micro-compacting of the web for a maximum useful stretch of about 20%

FIXX-Mode: pre-stretching of the web of about 2-4% for increased trim width, resulting also in increased CD-stiffness



from 240 mm to 194,7 mm



from 240 mm to 252,1 mm

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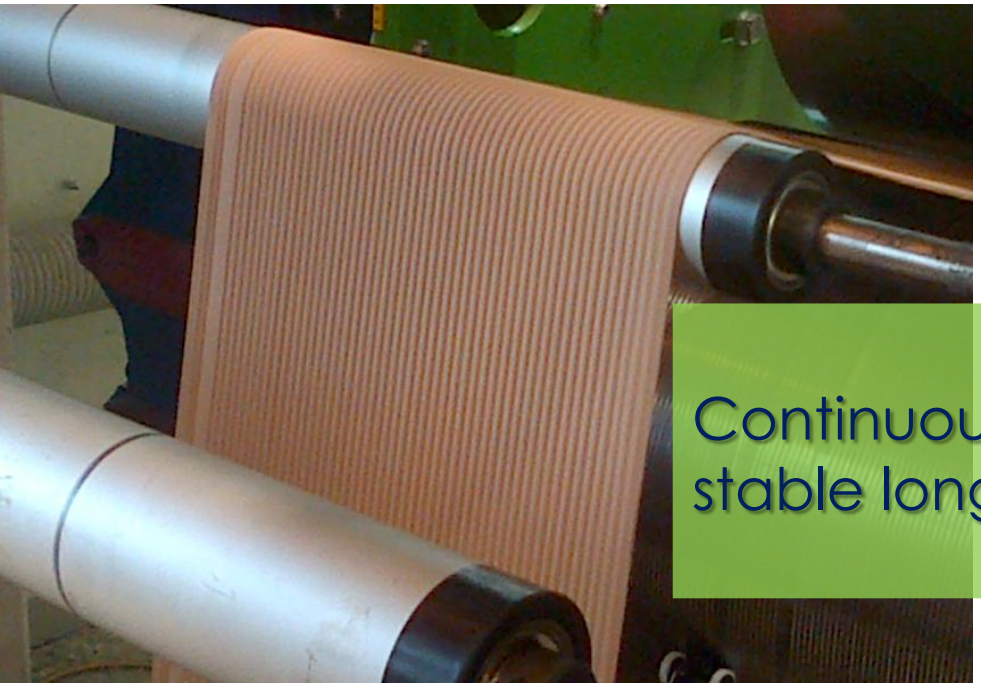
A look on the MD unit

For the combination with the **CD**-unit a novel **MD**-unit with many parameters for different settings has been developed:

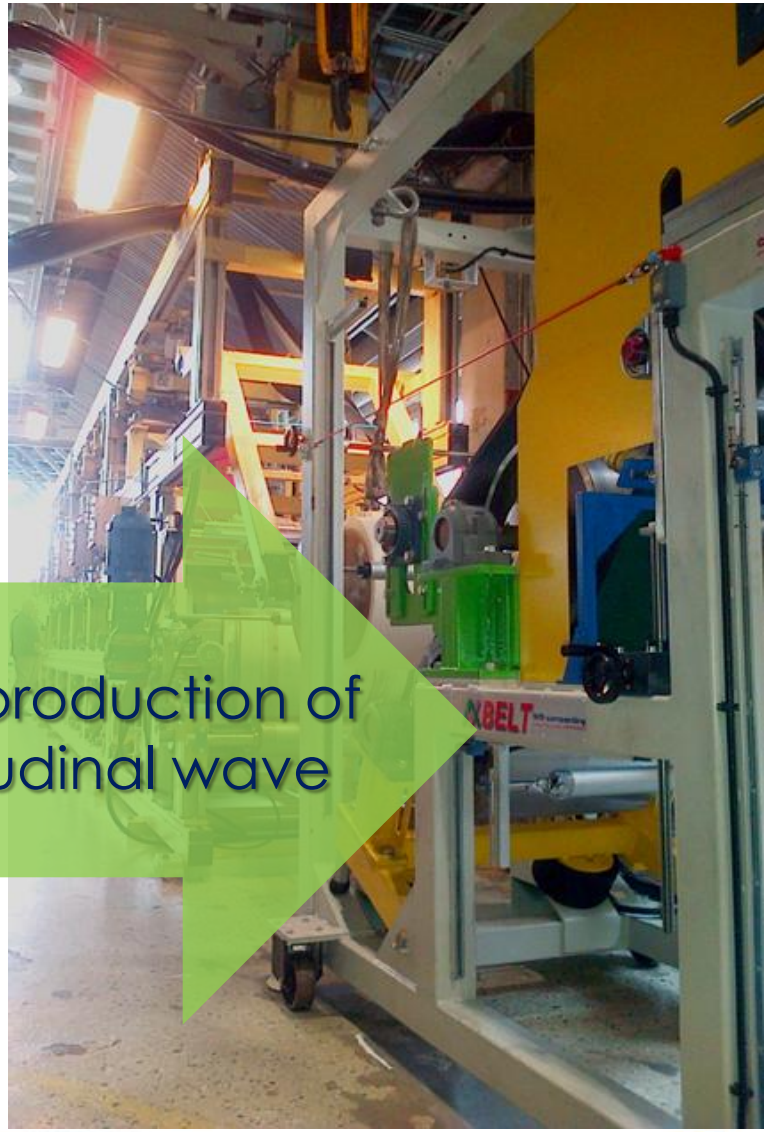
- adjustable Nip-properties
- adjustable size of contact area
- flexibility of desired stretch
- homogeneous profile over whole width
- no need of lubrication with water/silicone

Changing 1 parameter of the MD unit

- adjustable Nip-properties



Detail treated material



Continuous production of stable longitudinal wave

MD unit ahead the drying section

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WELLIXX – a novel MD-wave

- Stable wave
- No shrinking (ingoing width = outgoing width
- Continuous process
- Can be rolled up
- No need of strechable paper
- Many combination possibilities to other layers

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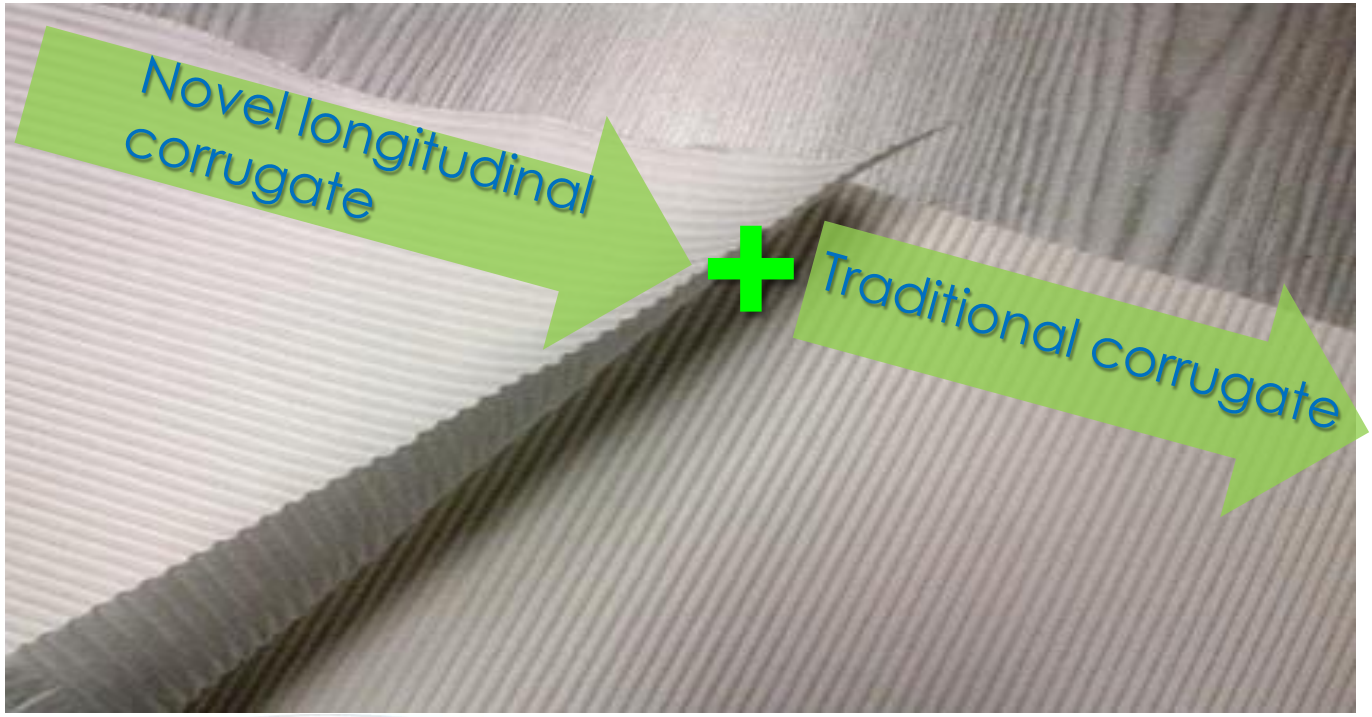
More stability in each direction

The MD-unit became a novel corrugator:

The longitudinal wave can be combined with traditional corrugate



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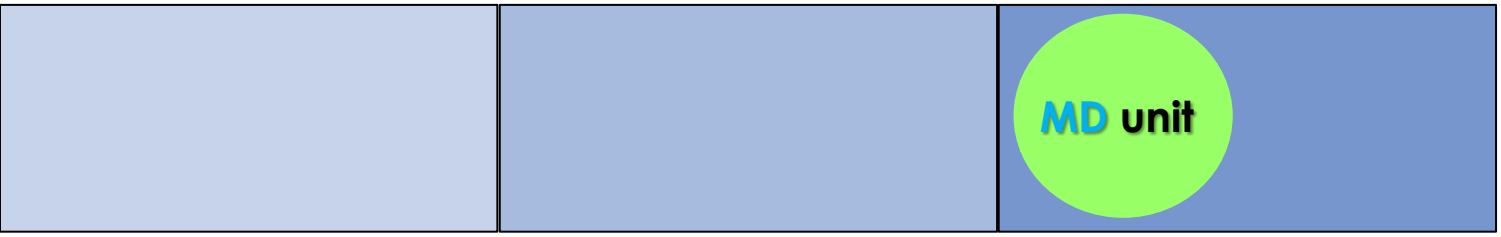
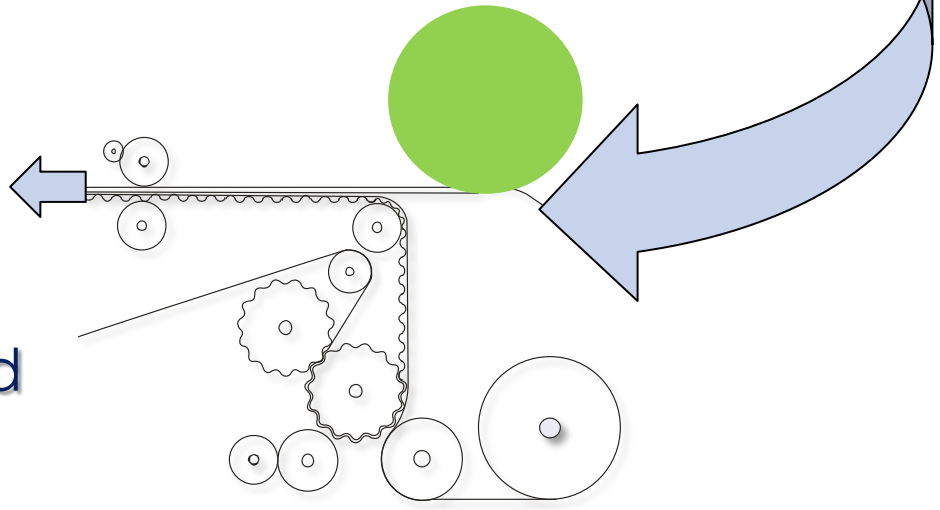
WELLIXX on-line on the paper machine

65% - 85% dry content



Production of 90° corrugated panels at the converter



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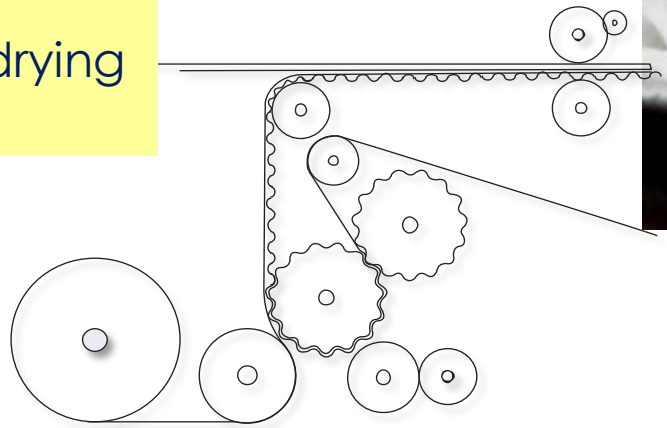
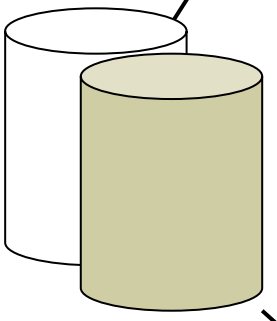
WELLIXX off-line at the Converter

MD unit

drying



MD + CD flute

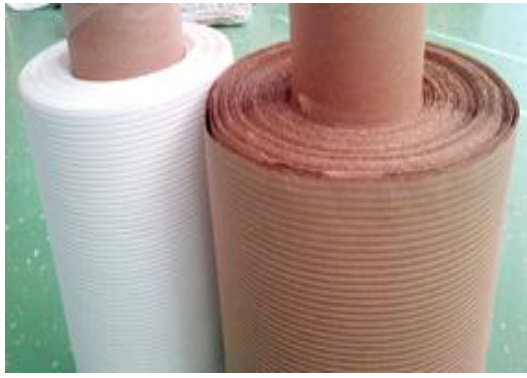


Papers at 80%- 85% dry content

MD unit

drying

Reels of longitudinal flute for further processing



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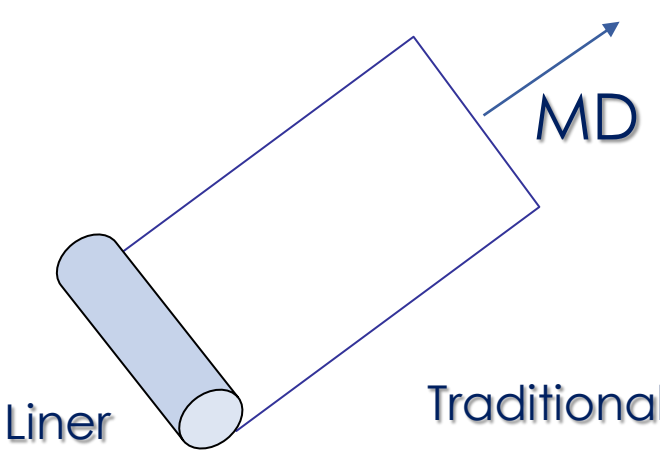
First studies on properties

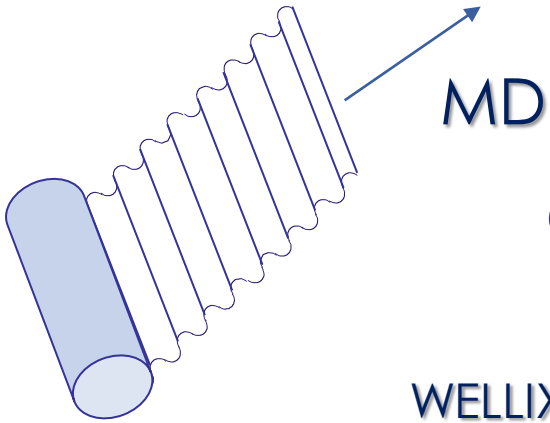
Today there is no standardized method for testing the novel MD-flute, but probably the normally relevant factors as burst or SCT might not be the only criteria anymore for base papers

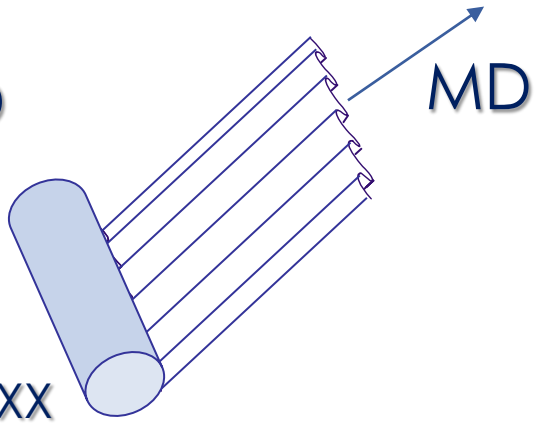
The longitudinal wave corresponds to the natural direction of fibers and might improve the behaviour in compression tests of boxes….

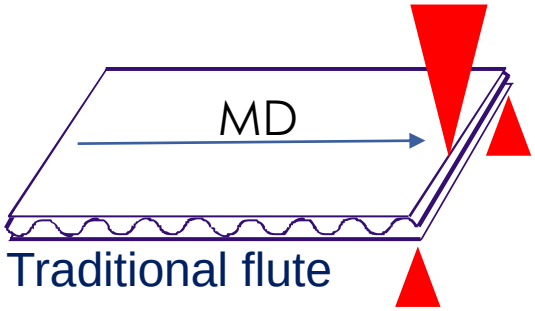
Sample of a 90 - combination combination by RISE

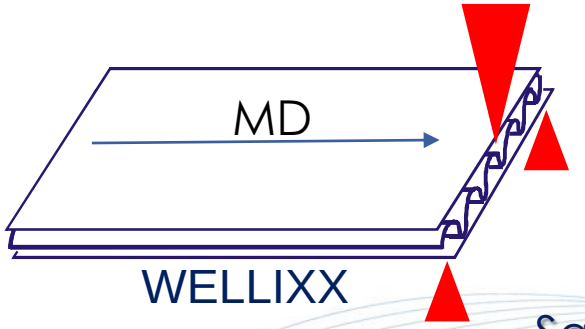
3 point bending at RISE

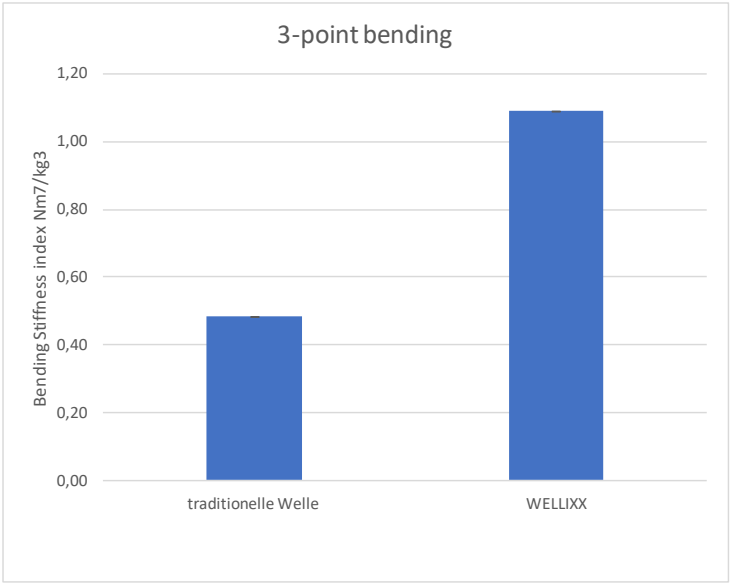












Sample size 60x25 mm

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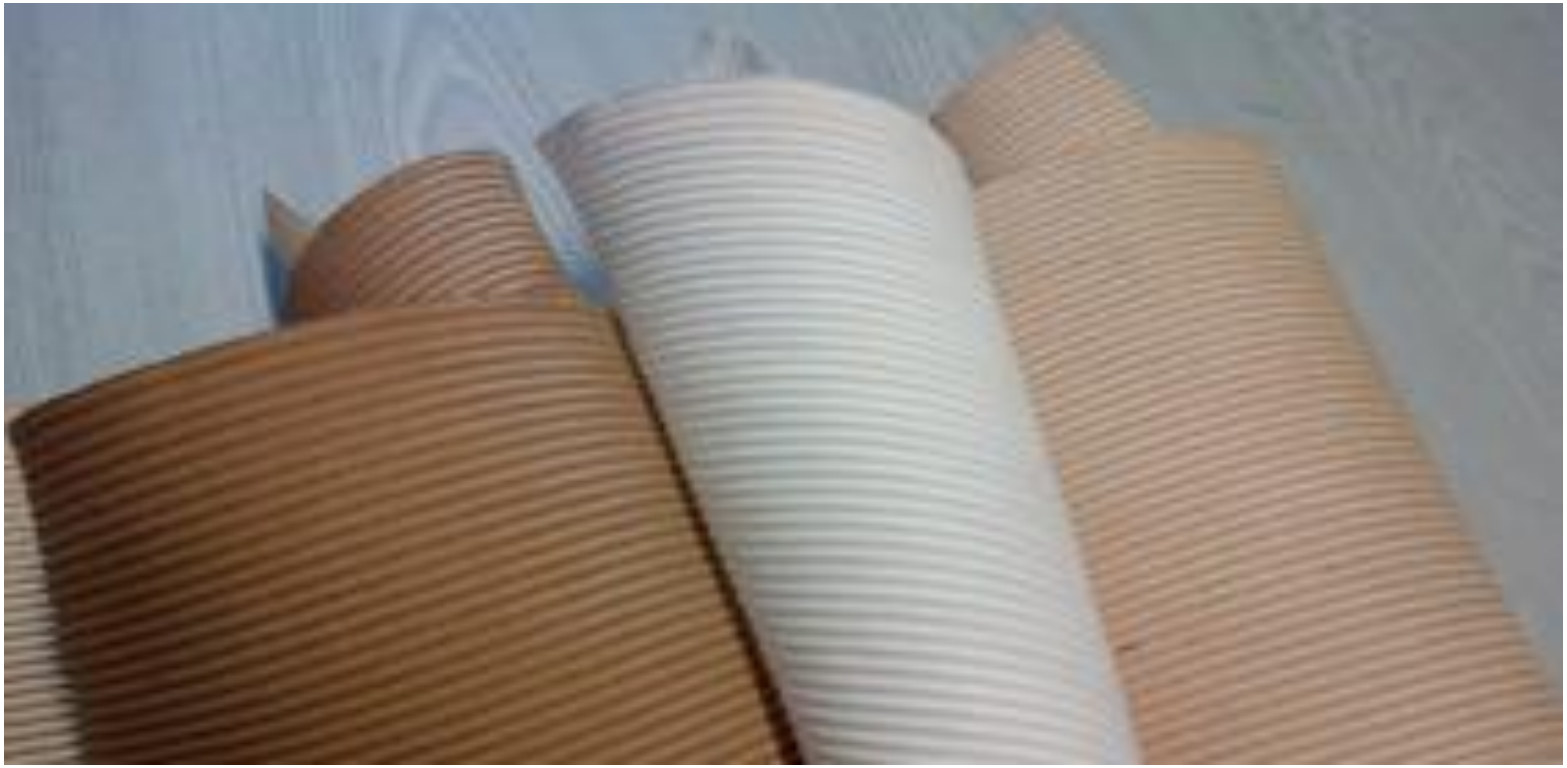
No “highly stretchable papers”



The novel longitudinal flute WELLIXX is made out of standard papers
NO stretchable paper or pretreatment for stretchability is needed

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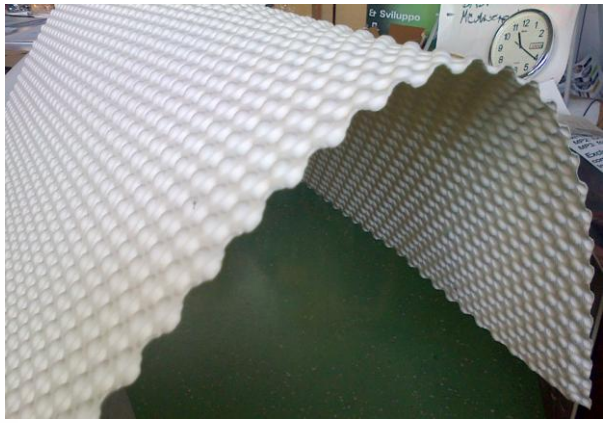
…but “stretchable papers” for individual structures

- Distance between layers
- Stiffening structures/diagonals
- attractive Corrugates



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papermorphosis - new units

Units for the installation in existing machinery for all paper grades, from virgin fiber to recycling paper and their mixtures for

- Improved or tailor-made standard grades
- Standard grades with less costs (raw materials, refining)
- New proudcts

Also for the sectors:

- corrugates
- Non wovens

in-line but also **off-line**

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  is specialized in stretch in papers,

- patents its proper innovations
- develops them
- licenses patents, know how, technology