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CREATING VALUE FROM WASTE

Why invest in pulp

Michael Smurfit's own story

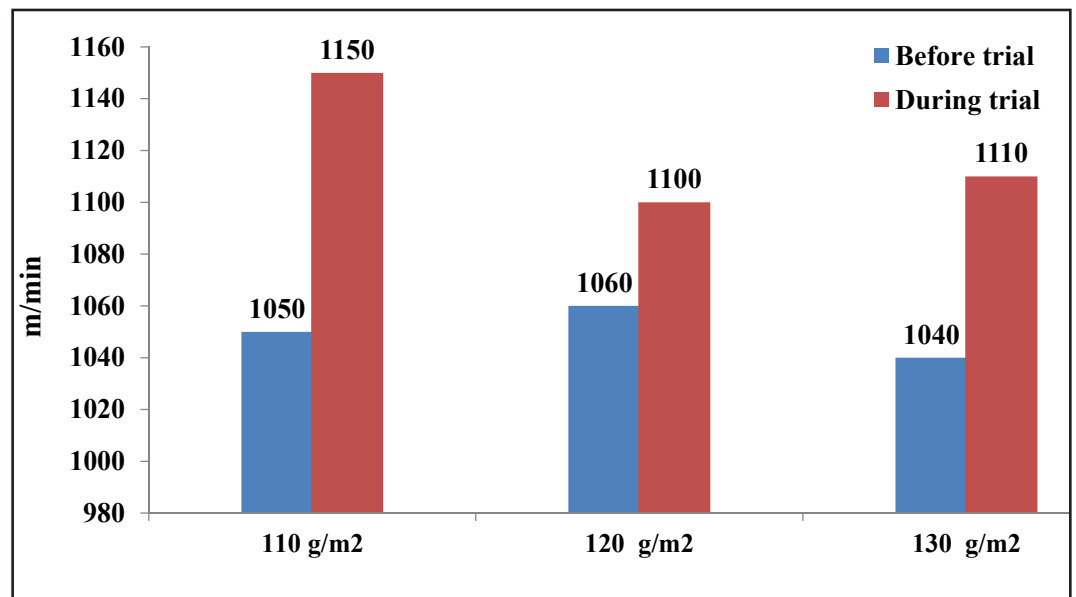
Breakthrough Technology

By HOU XIAOHONG

Advances in enzymatic technology have helped producers improve drainage and strength while boosting machine speed

APPLICATION OF **BUCKMAN MAXIMYZE®** **DRAINAGE TECHNOLOGY** ON PACKAGING PAPER

Fig. 1 – PM speed before and after the trial



IN VIEW OF THE elevated demand for the use of recycled materials from the paper mills, the recycling frequency of the recycled fiber has been greatly increased, resulting in reduced wastepaper quality and increased fiber fines in the process. Coupled with the limitation of fresh water consumption, the papermaking systems of most paper mills have become closed and more complicated. One of the problems encountered is an increase in the accumulation of water soluble colloidal substanc-

es in the white water that results in lower sheet drainage, high web moisture in the wire and press section as well as increased steam consumption in the dryer section, which ultimately affects the machine runnability, productivity and paper quality.

MAXIMYZE® ENZYMATIC TECHNOLOGY

Buckman has devoted significant effort in the past few decades to fundamental enzyme research to acquire a better understanding

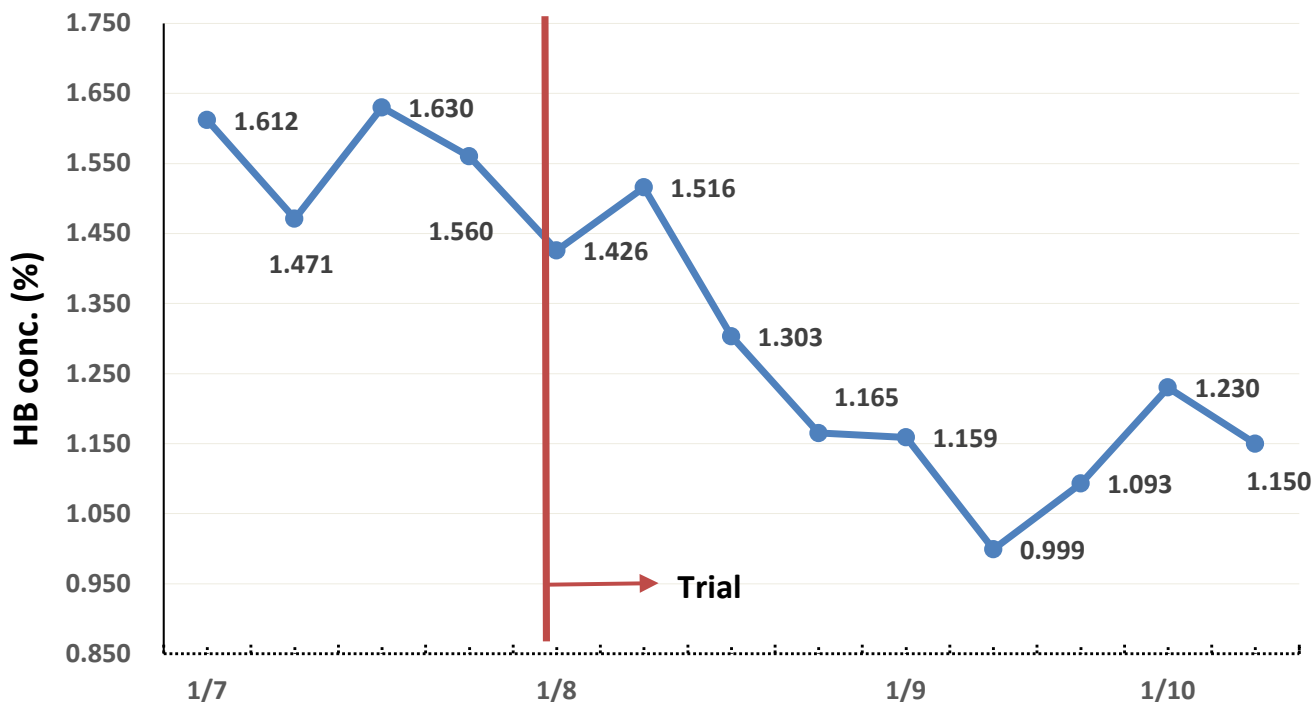


Fig. 2 - HB consistency

of their mechanisms. This research has provided a solid base for successful development of enzyme applications for the pulp and paper industry

Buckman developed a new enzymatic technology specific to packaging grades, and it is applicable for various kinds of wastepaper materials. This new technology is highly effective in improving pulp drainage, increasing machine speeds and paper strength properties.

This enzymatic product is applicable for recycled wastepaper materials, such as OCC, ONP, DIP, that are used to produce containerboard, corrugated medium paper, whiteboard, coreboard, newspapers, etc.

MECHANISMS

Maximize® 2598, a new generation enzymatic technology, is effective for improving the drainage efficiency of the wire and the press section by selectively degrading water soluble colloidal substances in the stock system. Due to its high specificity and efficiency, this enzymatic technology only works on water soluble colloidal substances and will not generate any detrimental effect on

cellulose fiber and pulp yield. In addition, the use of the drainage enzyme would clean up the papermaking system, reduce the wet end chemical consumption, improve paper strength properties, increase the ratio of lower quality wastepaper, and prolong forming wire and press felt life.

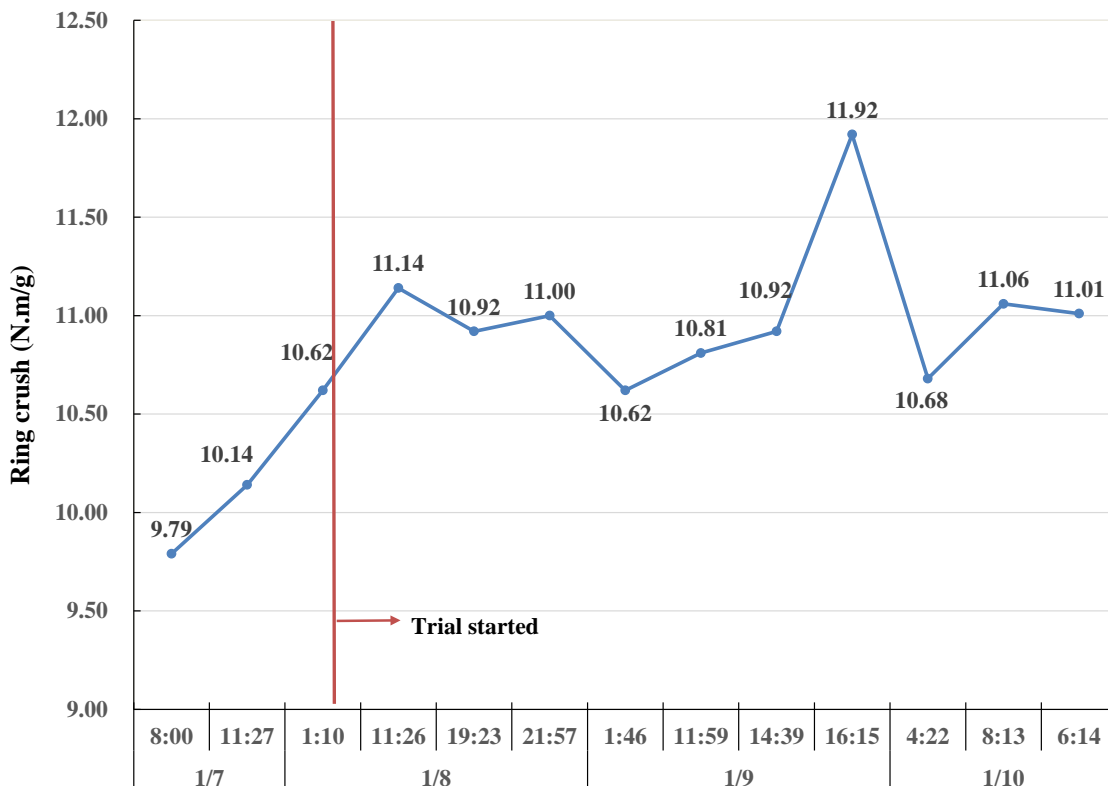
APPLICATION CONDITIONS

- **Feed point:** dump chest, pulp storage chest, mixing chest, etc.
- **Dosage:** 0.1-0.25 kg/ton (dry pulp)
- **Reaction time:** at least 30 minutes.
- **System pH:** 5.0-8.0
- **Temperature:** 30-65 °C

MAXIMIZE® CASE HISTORY

Maximize 2598 is being used successfully and consistently in a number of large-scale production lines and has demonstrated excellent performance. It helps papermakers to increase productivity and to improve quality and profitability. In 2012, the Buckman Maximize enzymatic technology was awarded the Presidential

Fig. 3 - Ring crush of the paper



Green Chemistry Challenge Award by the United States Environmental Protection Agency (EPA).

Mill A: Maximyze 2598 is applied on a containerboard machine that uses 100% recycled fiber (85% Chinese OCC+15% US OCC) with a production output of 1000 tons/day.

- **Paper grade:** 110-130 g/m² kraft paper
- **Trial objectives:** To improve drainage and machine speed and reduce steam consumption
- **Chemical program details:**
 - **Product:** Maximyze 2598
 - **Addition point:** Storage tower inlets of long fiber, middle fiber and short fiber lines
 - **Dosage:** 0.1-0.25 kg/ton dry pulp
 - **Temperature:** 30-65°C
 - **System pH:** 5.0-8.0

APPLICATION SUMMARY

Machine speed increased about 50-100 m/min and the production increased about an average of 50 tons/day

- Steam consumption was reduced by 6-8%

- Good paper quality
- ROI: Increase production; reduce overall cost and generate significant economic benefits
- ROE (Return on Environment): Lower steam and electricity consumption leads to the reduction of carbon dioxide emissions, i.e., about 1,806 tons/yr.

Mill B: Maximyze® 2598 is applied on a 100% recycled corrugated medium paper machine (100% Chinese OCC).

- **Paper grade:** 180 g/m² corrugated medium paper. Machine speed: 410 m/min
- **Trial objectives:** To reduce HB consistency and improve sheet formation and paper quality
- **Chemical program details**
 - **Product:** Maximyze 2598
 - **Addition point:** Storage tower inlet of OCC long fiber line and short fiber line
 - **Dosage:** 0.18-0.20 kg/ton dry pulp
 - **Temperature:** 30-65°C
 - **System pH:** 6.6-6.8

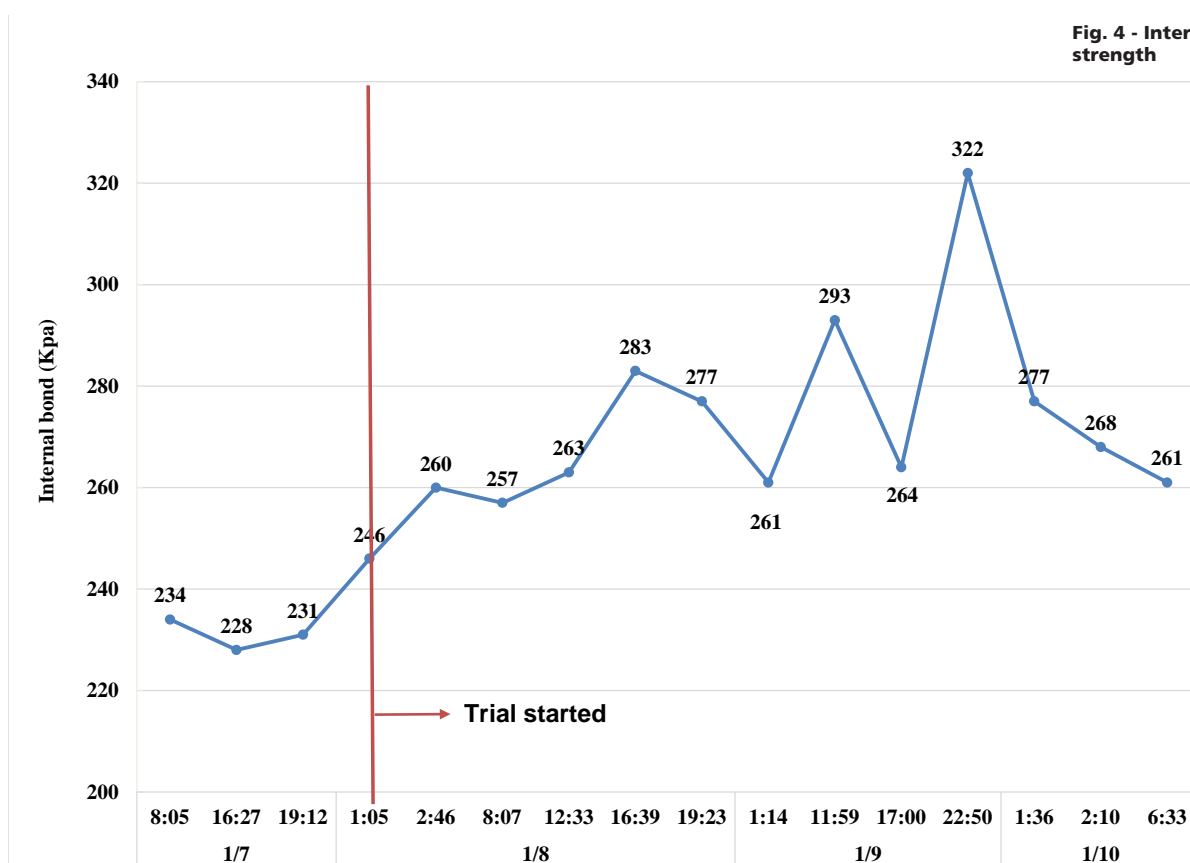


Fig. 4 - Internal bonding strength

APPLICATION SUMMARY

- Reduction of HB consistency from 1.57% to 1.15%
- Improve paper quality: ring crush increases from 9.97 N m/g to 10.98 N m/g; internal bonding strength increases from 231 KPa to 271 KPa
- Good machine runnability

APPLICATION STRATEGIES

It is essential to apply the enzymatic product appropriately in different compositions of raw materials and paper machine systems. Every enzymatic product has its own optimum pH and temperature range. During the practical application of enzymes, we have to make sure that the enzymatic product works in the optimum pH and temperature range to ensure high enzyme activity as well as adequate retention time in order to deliver the highest performance to the papermakers.

CONCLUSIONS

The Buckman Maximize® enzymatic technology is effective in different kinds of wastepaper materials and will potentially gener-

ate significant benefits to different paper mills, which include:

- Improved pulp drainage
- Reduced steam consumption about 4-8%
- Increased machine speed about 5-10%
- Increased use of wastepaper in the furnish
- Improved paper formation and strength properties
- Cleaner white water system

Buckman Maximize enzymatic technology is an environmentally friendly and sustainable chemistry. This technology has shown huge economic benefits and even better environmental benefits.

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Unpack the power of Maximyze[®] for packaging.

Let Buckman help you improve sheet strength and increase productivity

Buckman announces new Maximyze enzymatic technology for recycled packaging. It can significantly improve sheet strength and drainage, so you can increase machine speeds. With a customized Maximyze program you can reduce fiber costs, steam consumption, transportation costs and your environmental footprint too. No wonder it's an EPA Presidential Green Chemistry Challenge Award winner!

Find out more. Contact your Buckman representative or visit buckman.com.

Better drainage

Production on a recycled linerboard machine was limited due to drainage. Buckman's Maximyze application improved drainage, so machine speeds could be increased by as much as 100 mpm. Steam use was reduced 8%, and CO₂ emissions were reduced by 1806 metric tons per year.

Reduced energy

A core and tube producer wanted to increase production, have greater flexibility in its fiber selection and reduce energy use. Buckman applied Maximyze to the pulper, which conditioned the fiber faster with less refining energy, preserving fiber strength. Speed increased 10%. Refining energy decreased 30%. And tensile strength increased from 20 to 26 kgf/15mm.



Buckman

Commitment makes the best chemistry.