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TWM

TISSUE WORLD MAGAZINE

East China:

Economic powerhouse with stellar growth, a thriving urban middle class ... and a rampant price war



Special Feature: Private Label vs Brands
Sun Paper, Hebei Yihoucheng and APP talk to TW

Consumerspeak: Talking Tissue in Tokyo

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Read the latest from APP China
in our operations report on p.33

Quick links *Page*

F	FrontIssues	3
M	MarketIssues	4
W	World News	6
C	Country Report	18
O	Operations Report	25
T	Technical Theme	46
E	ExitIssues	60

TWM

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In this issue

FrontIssues	<i>Page</i>
Balancing sustainable growth with demand: east China's tissue industry responds	3
MarketIssues	4
Overheating investment activity threatening market balance in the North American tissue business. By Esko Uutela, principal, tissue, RISI	
World News	6
Get the latest news from the global tissue industry	
Country Report - Fisher International	18
Coastal China – positive growth through new and upgraded facilities	
Country Report - Euromonitor International	23
East China: tissue at a crossroads	
Operations Report: Sun Paper	25
Sun Paper moved into the tissue industry this June with the aim of becoming one of China's five largest tissue producers within the next 10 years. TWM meets its general manager	
Operations Report: Hebei Yihoucheng	29
Moving into tissue with a 2bn RMB investment means Hebei Yihoucheng is packing a punch	
Operations Report: APP	33
Overcapacity, price wars and sustainability: TWM talks to APP China's tissue business unit CEO	
Consumerspeak	37
Talking Tissue in Tokyo: Nana Sato discusses the wide variety of tissue products available in Japan	
FOEX	38
PIX Pulp indices 29.7.2014	
Special Feature	40
Read about the latest trends in the private label vs brands markets	
Chemicals Technical Theme: Kemira	46
Utilising novel temporary wet strength for the AfH towel market	
Chemicals Technical Theme: Solenis	49
The latest on innovation and sustainability	
Chemicals Technical Theme: Nalco	56
Improved DAF control provides water savings opportunities and minimised TCO	
ExitIssues	60
Searching for the hard facts on softness. By John Stitt and Holly Richardson, Buckman	
Events Calendar	67

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Balancing sustainable growth with demand: east China's tissue industry responds

Sun Paper's general manager Kevin Liu's English is near-perfect, so when he says "the tissue industry in China is just starting," the full impact of his words sinks in immediately. Had we been operating through a translator I would certainly have asked if he wouldn't mind repeating what he'd just said.

I spent six days in east China for this issue's regional report and as ever emerged hugely impressed by the country's drive, energy, achievements and massive potential.

Almost 9% average tissue consumption growth over a decade. If that's just starting, even given a start from a low base, then the future is immense.

There's a tangible sense of a great machine rolling unstopably forward, and 'just starting' is an accurate historical perspective.

Then that other word kept occurring to me: balance. The dangers of overcapacity and the current price war have been met within the industry with an extensive response seeing overheating development put on hold, or scrapped. Will it be extensive enough?

Every one of the leading tissue players I spoke to is poised at the starting line of a sprint race ... ready to dash for the rich rewards of the finishing line.

To strain the metaphor a little further, it's just that the man with the starting gun has asked them to break, take a little breather and re-settle in their blocks. But the runners are eager to get moving again. The medals are there, waiting to be won.

Cultural habits of tissue use are rapidly changing across the country. The powerhouse of the south east and first and second tier cities see consumers paying greater attention to tissue product quality, variety of product and variety of use. Consumers in the north want a product that is tough and not easy to tear. There, toilet paper is versatile and put to use all over the house, including at the dinner table. In the south a soft product is preferred and it tends to be used solely for the bathroom. Urbanisation is now encroaching more on third, fourth and fifth tier cities.

Squeezed pulp and paper manufacturers are rushing into tissue. Mr Liu's conglomerate is one, and already targets a top five position in ten years.

There is little brand loyalty. Hebei Yi-houcheng, which I also visited for this issue, stressed the significance of brand identity. A strong and well-established brand is also crucial in tackling the ongoing price war.

The area's potential remains clear: there is an immense number of inhabitants and a low penetration of hygiene products. Total retail tissue per capita consumption across the East China region was 5.5kg in 2013, opposed to the 8kg average in Japan. If the current 10% CAGR per capita volume growth is maintained, average consumption in the East will be on a par with Japan's by the end of the decade. Forgive me, but I enjoyed my metaphor so I'll finish with it. The race has to be paced properly ... go off too rapidly and we break down half way. Then it's tough to get back on track.

Tissue World Istanbul 2014

During 25-26 September, Tissue World will be hosting the newest event in its portfolio: a two day conference at the WOW Convention Center in Istanbul. It will feature conference, exhibiting-sponsors and social functions offering visitors the latest news, developments and opinions from the growing tissue industry and economies in Eastern Europe, Russia, CIS, Middle East, Central Asia and Africa.

For those that can't attend, watch out for the next issue of TWM which will summarise the key talks and opinions.



Helen Morris
Editor,
Tissue World Magazine

EDITORIAL HEADQUARTERS

UBM Media (Singapore) Pte Ltd

6 Shenton Way #15-08, OUE Downtown 2, Singapore 068809
Tel: +65 6592 0888 • Fax: +65 6438 6090

PUBLISHER

Ivan Ferrari
ivan.ferrari@ubm.com

EDITOR

Helen Morris
helen.morris@ubm.com

CONTRIBUTING EDITOR

Hugh O'Brian
hugh.obrian@ubm.com

ASSISTANT MARKETING MANAGER

Gautam Jatwani
gautam.jatwani@ubm.com

MANAGING DIRECTOR

Paul Wan
paul.wan@ubm.com

SENIOR VICE PRESIDENT

Chris Eve
christopher.eve@ubm.com

PRESIDENT/CEO

Jimé Essink
jime.essink@ubm.com

ADVERTISING ENQUIRIES

International sales

Paolo Rampetta
Tel: +32 2 646 1606
Fax: +32 2 653 8034
Mobile: +32 497 050 755
Email: paolo.rampetta@ubm.com

Asia-Pacific Sales

Ivan Ferrari
Tel: +65 6592 0888 Ext. 886
Fax: +65 6438 6090
Email: ivan.ferrari@ubm.com

TISSUE WORLD is published bi-monthly. The subscription price is US\$400 per year for 6 issues. Subscription is free for qualified subscribers in the tissue industry.

Please send address corrections to **UBM Media (Singapore) Pte Ltd**
6 Shenton Way #15-08, OUE Downtown 2, Singapore 068809
Email: info@tissueworld.com

Subscription online at www.tissueworldmagazine.com

In *Tissue World* all measures are metric and all dollars (\$) are US dollars, unless otherwise stated.

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Overheating investment activity threatening market balance in the North American tissue business

After the Great Recession of 2009 and the recovery in 2010, North America's tissue supply and demand have been well balanced, and from time to time, the business has been a seller's rather than a buyer's market. This was the case in the first nine months of 2012. Just before the first wave of new capacity started to come on stream, the US tissue market was very tight and independent converters were having problems procuring parent rolls for their converting plants. As a result, imports from overseas increased. But now the market outlook is that this "bird-nest-safe" situation will radically change in the next two to three years. A crowd of new investments has already been committed in North America, a number of further plans are under closer examination and even more are on the drawing board. With slowing growth in tissue consumption, the situation is worrying.

The US tissue market has lost some of its growth momentum and now population growth accounts for two-thirds of the volume increase. New ultra and premium products being introduced in the marketplace are increasingly bulky with declining fibre content and clearly weigh less than conventional tissue grades. This has resulted in a slowdown in weight-based growth rates. Tissue consumption really ought to be measured on an area basis like containerboard converting, although this is currently not statistically possible for roll production at tissue mills. Comparison between growth in parent roll production and converted tissue product shipments, based on monthly statistics collected by RISI, clearly show lower growth in production than in the number of cases shipped, which foreign trade developments in parent rolls cannot explain either.

The difference is the result of lightweighting: each case now weighs less as the same sheet count or roll size can be achieved using less fibre. In 2013, total

'This obvious overcapacity situation does not seem to be discouraging either existing players or new entrepreneurs from planning further investment.'

tissue consumption grew by only 0.9%, clearly below our expectations. And there is no improvement thus far in 2014. The first five months show only a marginal increase in consumption, which is also a reflection of the harsh winter conditions as GDP declines by 2.9% in the first quarter. We have revised our long-term forecast downward based on these recent developments.

However, keeping the market in balance lies not so much on the consumption side as on the supply side, as although growing slower, tissue demand has not collapsed. The issue is that too many investments have emerged. The pickup in investment activity has been influenced by several factors, but was likely started by the wish of the largest retailers, led by Wal-Mart, to upgrade part of their retailer offerings to be nearer to the level of the leading brands. Traditional private label tissue suppliers did not have sufficient capacity to fulfil additional demand for ultra-quality volumes for their own brands, and decided to build more capacity with First Quality Tissue, Clearwater Paper and Kruger paving the way. Investments were also seen in the AfH sector, again mainly targeting the high-quality segment.

'One packaging producer (rumoured to be one of the largest Chinese companies) has been studying the feasibility of building eight (!) new tissue PMs in North America.'



Esko Uutela

Principal,
tissue,
RISI

From the fourth quarter of 2014 to the end of 2016, we now have exactly a dozen new major capacity additions and only one small closure on our capacity change list. The net capacity change will be 650,000 annual tonnes, and based on the expected market growth, it will take more than five years before market growth can absorb all this capacity. In addition, this list only includes currently committed projects. We think that at least one more large-size TAD PM will also be added, as reportedly the final investment decision has already been made but not yet officially announced.

But this obvious overcapacity situation does not seem to be discouraging either existing players or new entrepreneurs from planning further investment. Several graphic paper producers are considering tissue investments, either PM rebuilds or totally new machines, for the survival of their mills that are suffering from the declining demand for graphic papers. Some tissue converters are also planning integration backward to tissue production of their own. Asian tissue producers have also recently announced their interest in tissue production in North America. In addition to Asia Pulp & Paper, whose two new PMs have already been announced, at least two more Chinese companies are planning major investments in the USA. One packaging producer (rumoured to be one of the largest Chinese companies) has been studying the feasibility of building

eight (!) new tissue PMs in North America. And even a larger plan with a straw pulp mill integrated with tissue production was recently released by Shandong Tranlin Paper, an investment totalling US\$2 billion over a five-year period, the details for which are, however, still missing.

Based on the current outlook, capacity utilisation will fall below 93% in 2015 and then further to 91% in 2016 and 2017 (Figure 1). Additional projects would further deteriorate the supply/demand situation. However, additional closures, which we consider likely, could help, albeit only marginally. There are some idle PMs in the industry which will likely never be restarted and will be removed from the capacity base after three years of continuous downtime. The largest players are expected to continue rationalisation

'Slowing market growth and the vast number of new projects will push the traditionally balanced North American tissue market into overcapacity from late this year through the next two to three years at least.'

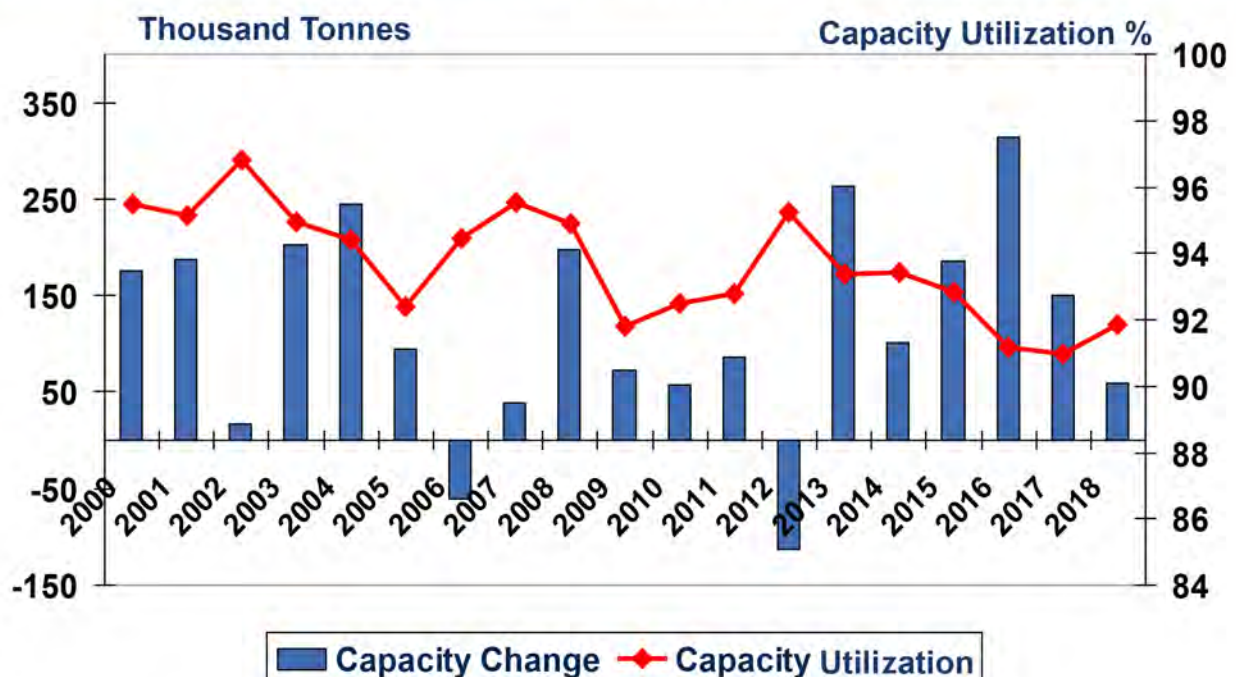
measures and close some older capacity, particularly if they build new PMs as rumoured.

Slowing market growth and the vast number of new projects will push the traditionally balanced North American tissue market into an overcapacity situation from late this year through the next two to three

years at least. Tissue buyers are expected to benefit from the increasing supply and producer margins are likely to suffer. The only hope is that something will happen to change the current outlook, including improving demand growth, removal of old capacity and/or project delays or even cancellations. Otherwise, the situation will soon resemble the chronically oversupplied Western European market that we saw from the mid-1990s until recent years.

Esko Uutela, principal, tissue, is the author of RISI's Outlook for World Tissue Business, the World Tissue Business Monitor, the US Tissue Monthly Data and the new Exploding Chinese Tissue Business - Opportunities and Challenges special report, which will become available in the third quarter of 2014.

Figure 1
Net Capacity Change* and Average Capacity Utilization in the North American Tissue Industry



* Based on committed projects only

FRANCE

Sofidel's new integrated tissue mill begins to take shape

Delipapier, Sofidel's French subsidiary, has broken ground on its €120m new integrated tissue mill project at its Ingrandes site.

The first phase consists of building a converting facility as well as storage areas for raw materials and for finished products, Delipapier mill manager Christophe Jacob told PPI Europe.

This phase should be completed by the end of 2014 or beginning of 2015, Jacob said, adding that the cost should amount to €30-40m.

Delipapier then plans to shut down its nearby converting facility in Buxeuil and to transfer its lines and 75 employees to the new site.

The second and third stages of the project will involve the construction of the tissue mill itself, which will have a production capacity of some 60,000tpy (compared to a current 20,000tpy capacity), and the extension of the converting facility and storage areas for raw materials and for finished products. "One or two converting lines could be added," Jacob said.

News from RISI (www.risiinfo.com)

TAIWAN

Cheng Loong to invest NT\$1.28bn in tissue paper expansion

Cheng Loong has earmarked NT\$1.28bn to build a tissue paper machine at its Chu Pei mill in Hsinchu county, Taiwan. Output on the new 32,000tpy machine, PM16, will mainly be sold on the domestic market.

The unit is slated to come online at the end of the third quarter next year.

Cheng Loong sees a potential growth of tissue consumption in the Taiwanese market, despite the island's stagnant economy for the past several years.

The investment in PM16 also aims to replace imports of tissue paper, which are mostly shipped across from China.

Taiwan imported 16,361 tonnes of tissue jumbo rolls in January-April this year, an increase of 3.4% from the same period last year.

The Chu Pei plant currently houses two

tissue machines that have a combined capacity of 48,000tpy, and a 42,000tpy cartonboard unit that manufactures coated grayback duplex board.

According to the Taiwan Paper Industry Association, total sales of tissue products on the island grew 1.8% during the first five months of this year compared to the same period last year, to 87,221 tonnes.

The growth was fuelled both by the grade's domestic shipments and by exports, with the former up 0.8% to 77,538 tonnes and the latter climbing 10.4% to 9,683 tonnes.

Conversely, Taiwan's graphic paper demand has been shrinking, hit by harsh economic conditions and competition from digital media.

The association's data show that graphic paper's total sales fell 1.4% in January-May from the year-earlier period, to 252,693 tonnes.

Domestic deliveries dropped 1.2% to 163,485 tonnes, while exports slipped 1.7% to 89,208 tonnes.

News from RISI (www.risiinfo.com)

CHINA

SCA and Vinda to integrate hygiene business

SCA has strengthened its cooperation with Vinda International by transferring its hygiene business in China (mainland China, Hong Kong and Macau) to Vinda.

As part of the transaction, SCA and Vinda have signed an agreement regarding the exclusive license to market and sell the SCA brands; TENA, (incontinence products) Tork (AfH tissue), Tempo (consumer tissue), Libero (baby diapers), and Libresse (feminine care) in China (mainland China, Hong Kong and Macau). With this agreement, Vinda will hold the rights to these product brands in these Chinese markets.

Vinda will acquire SCA's Dr P and Sealer brands in China.

Jan Johansson, president and chief executive of SCA, said: "With its immense number of inhabitants, ageing population and low penetration of hygiene products, China is an attractive and important market with significant

"China is an attractive and important market." SCA president and CEO Jan Johansson





TWM cartoon | September/October 2014

potential for future growth.

"This new cooperation and transaction will generate mutual benefits for both SCA and Vinda particularly in distribution, sales, innovation and R&D. "Vinda will get access to a broader product portfolio and SCA's brands will have the potential to reach a broader base of consumers and customers via the extensive and robust distribution network of Vinda in China."

SCA has been a shareholder in Vinda since 2007 and it became its majority shareholder in late 2013.

SCA's hygiene business in China (mainland China, Hong Kong and Macau) had net sales of approximately SEK 600m in 2013.

The purchase consideration amounts to HKD 1,144m on a debt-free basis.

The agreement is subject to approval by the independent shareholders of Vinda.

Environmental concern and market competition driving upgrades at small tissue mills in China

Although the Chinese tissue sector is in a state of oversupply and major mills are grabbing more market share, small players will not necessarily disappear,

said Cao Zhenlei, Director of the China National Household Paper Industry Association (CNHPA).

At a seminar held by the association and tissue producer Hebei Yihoucheng Commodity recently in Mancheng County, Hebei province, he said: "Due to the country's vast territory, the Chinese market features a diversified structure, and small producers still have space to develop."

Mancheng is home to some 100 small mills making around 700,000tpy of tissue, occupying one tenth of the national market.

Some leading regional firms there are investing in new PMs to enhance their position.

Hebei Yihoucheng is planning a second 25,000tpy tissue PM at a mill in Mancheng after a 25,000tpy Andritz unit came online in May.

The startup of the new machine is scheduled for next year.

Meanwhile, Baoding Gangxing Paper looks set to start up a Kawano Zoki machine with a capacity of 15,000tpy at its site in Mancheng.

And Hebei Xuesong Paper fired up a 25,000tpy unit supplied by the PMP Group earlier this year.

Seeking to upgrade: Mancheng's increasing use of imported PMs can be

ascribed to increasing awareness of quality and environmental factors.

Traditionally, plants there have run many small, domestically-made PMs, each unit having an annual capacity of several thousand tonnes of poor-quality tissue.

And the county's tissue mills have long been blamed for causing serious pollution, in particular the Baiyangdian Lake incident in 2006.

The body of water, which is downstream from the tissue production hub, is the largest freshwater lake in the region.

A mass kill of fish and a dark greenish surface was reported in 2006, drawing national attention.

With environmental problems looming large in public discourse, the Chinese government has tightened pollution control measures.

Large scale obsolete capacity shutdown campaigns have been carried out for years across the country to encourage cleaner production.

Meanwhile, smog has been troubling the country, especially in the northern regions of Hebei province and Beijing.

This has forced the government to take strict measures to improve air quality.

Last winter, tissue mills in Mancheng were forced to suspend production due to heavy smog.

Moreover, local mills have been urged to

rebuild their boilers to use gas instead of coal, which is thought to be the main source of the smog.

Hebei Yihoucheng was the first tissue mill in the county to use gas instead of coal to generate power.

The firm's general manager Tian Yuwei admitted that the cost of gas is currently a little higher than that of coal. But in the long run, he believes that gas can help achieve sustainable development. In April, China revised its environmental protection laws, with the revisions coming into effect January 1.

The new laws, believed to be the strictest on environmental protection in the country so far, will not only greatly reinforce protection measures, but also impose more severe punishments for any violations.

In the face of such pressure, the new PMs at Mancheng are believed to be a response, as they are more efficient and energy-saving than the old units, and can better meet the environmental standards in question.

Mancheng's potential: The CNHPA's data showed the output of the four largest tissue firms in China last year accounted for 30.7% of total production in the country, and their sales volume accounted for around 35.4% of the industry's total.

In 2010, the percentages were 22.6% for output and 27.9% for sales.

But most such output is from plants in China's eastern and southern provinces. So far, there are no very big mills in northern China, which gives some room for Mancheng producers to develop.

What's more, Mancheng is just 200 km from Beijing and Tianjin, which have a combined population of around 35 million; the proximity provides, according to the CNHPA, great opportunities.

Tissue expansion: China's tissue sector has seen rapid growth in recent years. According to the CNHPA, China's tissue consumption and output in 2013 reached almost 6.04 million and 6.81 million tonnes respectively, up 7.2% and 8.5% over 2012.

The consumption of tissue per capita in China reached 4.4 kg in 2013, close to the world average consumption of 4.5 kg per capita.

In 2008, consumption was only 3.0 kg per capita in China.

The development has spurred an investment frenzy in the segment, with many new PMs firing up in the near term. Hengan International will start up eight

60,000tpy tissue unit by 2015, raising its total capacity to almost 1.4 million tonnes/yr.

C&S Paper started up a 60,000tpy tissue PM at a greenfield site in Luoding city, Guangdong province, and a second, identical one is scheduled to come online there later this year.

Moreover, Guangxi Hwagain fired up a 60,000tpy tissue machine in March at a site in Ganzhou city, Jiangxi province. Last year, that same mill started up a 60,000tpy tissue unit.

Meanwhile, new players are diversifying into the sector.

Sun Paper started up a 60,000tpy tissue PM in June at its flagship mill in Yanzhou city, Shandong province.

A second one with the same capacity is expected to come on stream next year.

Zhejiang Jingxing Paper, a recycled containerboard producer, ordered a pair of 25,000tpy tissue units for a plant in Jiaxing city, Zhejiang province. The first one is planned to kick off production later this year, followed by the second next year.

News from RISI (www.risiinfo.com)

Shandong Sun Paper boosts capacity

China's Shandong Sun Paper has started up an Andritz-supplied PrimeLine™ W8 with Steel Yankee at its Yanzhou mill, Shandong province.

PM27 has a design speed of 2,000m/min and a width of 5.62m. The Yankee, manufactured entirely of steel, has a diameter of 18 feet.

The turnkey supply included the complete stock preparation plant and the automation system as well as a re-evaporation and heat recovery system that recycles energy – in the form of steam – to the production process. In combination with the Steel Yankee, this enables very energy-efficient and safe production.

Start-up of a second Andritz-supplied tissue machine for Shandong Sun Paper (PM28) is scheduled for next year.

For this issue's east China regional report articles on Sun Paper, Hebei Yihoucheng and Asia Pulp and Paper, see pages 25, 29 and 33.

Shandong Dongshun starts up three tissue PMs, six more coming

Shandong Dongshun Group has started up three new tissue PMs in China, adding a combined capacity of 48,000tpy.

All three units, provided by Kawanoe Zoki, are identical. Each has a trim width of 2.76m and a design speed of 1,000m/min and can produce tissue at a rate of 16,000tpy.

Two are located at the firm's flagship mill in Taian city, Shandong province. The other is at a site in Zhaodong city, Heilongjiang province.

Shandong Dongshun will bring six more tissue PMs online at the Taian site by 2015.

Four will be co-supplied by the Japanese supplier and by Valmet.

Each unit, with a capacity of 25,000tpy, will have a trim width of 2.85m and a design speed of 1,300m/min.

The first two PMs will be delivered to the site this month and in September. Their startups are scheduled for the end of this year. The other two units will be fired up in the second half of 2015.

Meanwhile, Shandong Dongshun is diversifying into the hand towel segment. It has signed up Kawanoe Zoki to supply two PMs to produce the grade. Each PM will be 2.85 m wide and have a design speed of 450m/min. The output of the PMs will be in the basis weight range of 32-50g/m².

The first unit is planned to be delivered around November 2014, followed by the second in November 2015.

News from RISI (www.risiinfo.com)

Zhuji Paper considers installing new tissue PMs with a combined capacity of 30,000tpy

Shaoguan Nanxiong Zhuji Paper is mulling over building two tissue PMs with a combined capacity of around 30,000tpy at a mill in Nanxiong city, Guangdong province, China.

The firm and its parent company Guangdong Shaoneng Group would fund the project, which would cost RMB 178.9 million (\$29m).

The firm currently has a capacity of 65,000tpy of bamboo pulp and 35,000tpy of uncoated printing and writing paper at the same site.

Zhuji Paper has been losing money



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over the past years amid the weak pulp and paper market in China.

To increase profitability, the firm plans to diversify into the tissue sector, using its in-house bamboo pulp capacity as furnish.

A specific timeline for the project is unknown so far.

News from RISI (www.risiinfo.com)

Yunnan Yunjing testing 30,000tpy tissue PM

Yunnan Yunjing Forestry & Paper has kicked off mechanical tests on a new 30,000tpy tissue PM at a mill in Puer city, Yunnan province.

The Valmet unit will have a width of 2.85m and an operating speed of 1,870m/min.

The supplier's delivery included a headbox, a press, a special alloy cast iron yankee cylinder with a hood, stock preparation equipment, and automation and quality systems.

Virgin fibre produced on site will be used to furnish the PM.

The site houses two bleached kraft

pulp lines with a combined capacity of around 195,000tpy.

Luohe Yingde Tissue Paper boosts capacity

Luohe Yingde Tissue Paper has responded to customer demand after it started up NipcoFlex T shoe presses in two tissue lines supplied by Voith.

General manager Shilin Zhang said the investment means the company can "consolidate and expand our position in the Chinese market".

He said: "We are now in a position to meet the increasing requirements of our customers regarding quality and quantity and have thus achieved our aim."

In 2012, Voith delivered two identical lines for the production of tissue paper in a basis weight range of 12–30g/m² to Luohe Yingde Tissue Paper to China.

The lines include the entire stock preparation, the wet end process and the tissue machines, from the headbox to the reel.

Qifeng Wang, Luohe Yingde Tissue Paper vice general manager, said: "After this

most recent investment we can obtain a dry content after the press which is 5% higher than with conventional technologies.

"Thus we save 20% of thermal energy in the dryer section."

Luohe Yingde Tissue Paper was founded 20 years ago in the province of Henan, China.

The Voith tissue machines are designed for an operating speed of 1,900m/min and to produce 60,000tpy.

Chongqing Well Mind starts up 30,000tpy tissue PM

Chongqing Well Mind Paper has started up a 30,000tpy tissue PM at its mill in Chongqing municipality.

Supplied by A Celli, the machine has a trim width of 2.85m and a design speed of 2,000m/min.

The first sheet of paper rolled off the line on 21 May and the unit is gradually ramping up production.

The firm signed up A Celli in 2010, but the project hit a delay, and civil engineering work did not kick off until 2012.

Quality upgrade: Voith has supplied new NipcoFlex T shoe presses for Luohe Yingde



In addition to the new PM, the site currently has a capacity of around 24,000tpy of tissue.

Hebei Yihoucheng starts up 25,000tpy tissue PM

Hebei Yihoucheng Commodity has started up a 25,000tpy tissue PM at its mill in Baoding city, Hebei province. The unit, supplied by Andritz, has a width of 2.85m and a design speed of 1,650m/min. It has a Steel Yankee drying cylinder with a diameter of 3.65m. The PM was originally to be fired up by the end of last year, but construction work was delayed.

Sichuan Yibin to start 350,000tpy cartonboard PM; tissue units under consideration

China's Sichuan Yibin Paper is erecting a new 350,000tpy cartonboard PM at a greenfield mill in Yibin city, Sichuan province.

It is expecting to finish construction around August. Trial runs will commence soon after that, said a spokesperson from the firm.

The PM, which is being supplied by China Paper Equipment, will have a design speed of 900m/min and a daily capacity of 1,050 tonnes. It is planned to produce food packaging.

The company used to operate three PMs with a total capacity of around 200,000tpy of newsprint, food packaging board, and printing and writing paper at a nearby site, which was shut down in 2011.

Sichuan Yibin Paper is also mulling over building tissue PMs with a combined capacity of around 100,000tpy at the new mill.

The spokesperson said that the firm has been out of production for almost two years and is looking for new opportunities for development.

Moreover, Sichuan is abundant in bamboo, and the firm plans to make use of integrated bamboo pulp capacity to make tissue.

The source said that the tissue project is still at the planning stage, but the PMs are expected to come online in two years if everything goes smoothly.

The firm is going to raise up to RMB 1.08 billion (\$175.6 million) to fund its

new cartonboard and tissue PMs via a private placement.

The plan has been greenlit by the firm's board of directors, and needs further approval by the Chinese authorities.

Sichuan Yibin, listed on the Shanghai stock exchange, reported its 2013 sales at RMB 10.5 million, down 43.34% over 2012.

News from RISI (www.risiinfo.com)

Shandong Dongshun testing new 16,000tpy tissue PM, more to come

China's Shandong Dongshun Group is testing a new 16,000tpy tissue PM at its mill in Taian city, Shandong province.

The Kawano Zoki unit has a trim width of 2.76m and a design speed of 1,000m/min.

The firm will also soon install an identical PM at the same site.

In addition, another pair of tissue PMs will be delivered to the Taian mill in July and September respectively.

Their startups are scheduled for the end of this year. Each with a trim width of 2.85m and a design speed of 1,300m/min, they will be co-supplied by Valmet and the Kawano Zoki.

The two suppliers agreed that Kawano Zoki is responsible for the marketing, manufacturing, and installation of the machines.

The units are to be produced at the Japanese supplier's plant in China, and some key components including headboxes, Yankee cylinders and suction pressure rolls are from Valmet.

The suppliers will supply two more PMs, identical to the first pair, to Shandong Dongshun.

The second pair is scheduled to come online in the second half of 2015.

In addition to its expansion in Shandong, the tissue maker will test a 16,000tpy Kawano Zoki PM at the end of May at its site in Zhaodong city, in China's northwestern province of Heilongjiang. The unit is 2.76m wide and has a design speed of 1,000m/min.

The Zhaodong site currently runs a 12,000tpy tissue machine.

Diversifying into hand towels: Shandong Dongshun has long been focusing on the production of toilet paper and facial tissue, and it is now diversifying into the paper hand towel sector.

According to Kawano Zoki, it will supply two PMs making the grade to the

firm's Taian facility.

Each will have a trim width of 2.85m and a design speed of 450m/min. Output of the PMs will have a basis weight range of 32-50g/m².

The first PM is planned to be delivered around November 2014, followed by the second in November 2015.

The tissue sector in China is currently confronting an oversupply issue due to a quick increase of capacity over recent years.

Instead of focusing on toilet and facial tissue products, more producers are tapping into varied end use markets, with hand towels as one such new direction.

News from RISI (www.risiinfo.com)

UK

NorthEdge purchases Accrol for £66m

Private equity company NorthEdge Capital has purchased Blackburn-based tissue converter Accrol Papers in a £66million deal.

Accrol is one of Europe's largest independent converter of soft tissue products. Established in 1993, it employs 300 staff with a current turnover exceeding £100m.

It has a manufacturing capacity in excess of 80,000 tonnes per annum.

The business manufactures a wide range of household and AfH tissue products for a range of leading retailers and service providers from its purpose-built production facilities in Blackburn.

The investment by NorthEdge will facilitate the acceleration of the company's expansion programme to increase capacity and support further growth, job creation and product development.

Majid Hussain, chief executive of Accrol, said: "The investment from NorthEdge follows a sustained period of growth for the business during the last five years. The capital will allow us to accelerate capital expenditure to increase output and ensure that we continue to deliver the highest quality products and services to our customers."

"We look forward to working with the team at NorthEdge to drive the business forward and continue to increase our support to customers."

Dan Wright, Partner at NorthEdge Capital, said: "Accrol .. is a fast growing business

with a significant share of the UK market and an impressive customer base.

"With ambitious growth plans, the investment from NorthEdge will enable it to accelerate its strategic development."

CHILE

FPC to start up new 70,000tpy tissue PM in 1Q15

Chilean packaging producer Forestal y Papelera Concepción (FPC) has scheduled for the first quarter of 2015 the startup of its new 70,000tpy tissue paper machine (PM) to be installed at the company's Coronel mill, in the Biobío region.

Supplied by Metso, the new PM will be part of FPC's debut project in the tissue market.

According to the company, 20,000tpy of the total output produced on the new tissue PM will be sold in the Chilean domestic market, while 40,000tpy should be shipped to the USA and 10,000tpy to Asia.

The project also includes a Futura converting line, which is expected to start operating by the end of 2014.

The company plans to buy tissue paper from third-party suppliers to supply the new converting line since its PM is not running yet.

FPC's total investment in the venture is estimated at \$150m.

The company currently produces 105,000tpy of containerboard at its

Coronel mill, in central Chile.

News from RISI (www.risiinfo.com)

SpA obtains preliminary license for tissue plant in Los Ríos region

The Chilean company Productora y Comercializadora de Papeles (SpA) has obtained a preliminary environmental license for a new tissue paper plant to be built at the Los Ríos region.

The license was issued by the Chilean Environmental Assessment Service (SEA)'s regional office.

Now, SpA's tissue mill environmental report must follow the usual evaluation regarding the production process effects on the country's southern province.

According to the report submitted to the SEA, SpA's endeavour consists of a mill with capacity to produce approximately 2,700tpy of tissue, monolucid and specialty papers.

The plant will use second-hand bleached pulp, which hasn't been considered up to par for commercial use at its original production site.

The company said: "It [this kind of pulp] is a useful raw material for the development of this kind of paper, which requires no transformation processes, but rather a structural rearrangement of its fibres, in order to meet the appropriated specifications for resistance, moisture and density."

Currently, the total investment is estimated at around \$1.45m and

the company expects to complete the project and start up the plant approximately six months after the definitive environmental licenses are granted.

SpA also plans to install a 4,300tpy pellet production line at the site, which will provide power to the paper line.

News from RISI (www.risiinfo.com)

MEXICO

K-C starts up PM at Bajío mill

K-C starts up PM at Bajío mill in Mexico Kimberly-Clark de Mexico (KCM) has fired up late in June its new 60,000tpy tissue paper machine PM5.

It is understood that the machine started production in the end of June.

The PM is installed at KCM's Bajío mill, located in the Mexican Querétaro state, and will raise the plant's capacity to approximately 270,000tpy.

With the new PM, KCM's total tissue paper production capacity jumps to approximately 735,000tpy, distributed among six mills in the country.

MIDDLE EAST

Hayat Kimya expands further into the Middle East

Turkish tissue producer Hayat Kimya has ordered its fifth Advantage DCT 200 tissue line from Valmet.

The line will add 70,000 tonnes of high quality tissue to the company's current production of facial, toilet and towel tissue.

Start-up of the line is planned for 2016 and the value of the order has not been disclosed.

The move is part of Hayat Kimya's expansion plan into the Middle East.

The first two of the Valmet delivered Advantage DCT 200 tissue lines were started up in 2010 and 2013 and two will start up in 2014 and 2015.

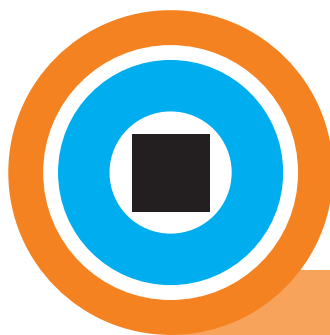
USA

First Quality announces an up to 8% increase on its tissue paper products

In what appears to be the first official tissue paper price increase for consumer/

Turkey's Hayat Kimya orders its fifth Advantage DCT 200 tissue line from Valmet, pictured





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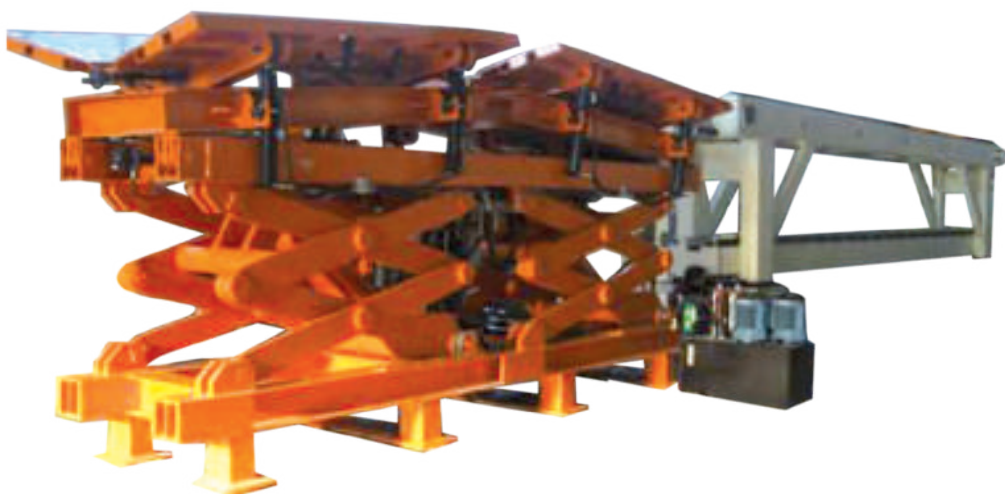
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For U.S.A market requests contact the affiliated Company Goldenrod Corp. - www.goldrod.com



retail products in three years in the USA, First Quality Tissue has announced an up to 8% price increase on its towel and tissue products.

"All orders placed after 1 July 2014 or shipped on or after 1 August 2014 will be invoiced at the increased prices," the company said.

First Quality plans two new tissue paper machines in the next two years in the USA and has grown its capacity with two new PMs over the last three years at its manufacturing and converting line complex in Anderson, SC.

The company also operates two tissue paper PMs in Lock Haven, PA.

First Quality Tissue boosts capacity

America's First Quality Tissue has ordered a complete Advantage ThruAir (TAD) tissue line for its Anderson, South Carolina-based site.

The line is planned to be started-up in the second half of 2015 and will add 70,000 tonnes of ultra premium quality tissue to the company's annual production. The value of the order has not been disclosed.

First Quality Tissue manufactures nondiscretionary consumer products and is a member company of the privately held First Quality group of companies, headquartered in New York.

It has four tissue machines in Lock Haven, Pennsylvania and in Anderson, South Carolina.

First Quality confirms site for first new TAD PM start-up

First Quality Tissue has confirmed it will install the first of its two new TAD machines at its existing Anderson, South Carolina site.

The company has previously announced plans to add two additional TAD paper machines with an estimated annual capacity of 140,000 tonnes. Startup of these machines is expected to be late 2015 and 2016.

Three TAD machines will now be based at the Anderson site to create a combined capacity of 210,000 tonnes.

The location of the second TAD machine is still under consideration and will be announced within the next few weeks after completion of due diligence.

First Quality said the move was in response to the future requirements within the ultra-premium market.

It said: "Additional state of the art

Tissue World portfolio: helping connect the dots

As you will have noticed, Tissue World is changing. In the last year alone we have introduced the Tissue Retail Insight Forum (TRIF) in Miami, we launched two new shows in Istanbul and Sao Paulo, we increased our online presence, and we presented a new magazine layout enriched in its content. In particular, TRIF is intended to integrate the manufacturing, retailing and distribution segments in all future Tissue World events, thus representing the whole tissue industry by covering its complete value chain.

The aim of all these initiatives is simple: to create a global network of entry points for the whole tissue industry to conduct business and learn in key markets worldwide. All year round.

Aleksandar Tomovic, 9. Septembar - sales director (Americas), on Tissue World Sao Paulo:

"We have noticed an increase of interest from South America for our tissue converting machines, and what better way to meet our clients and future clients than at Tissue World exhibit in Sao Paulo, Brazil."

Tissue World Sao Paulo was born out of the desire of local and international tissue companies to have a visible and systematic presence in South America, one of the most interesting and fastest growing markets in the world. A region that encompasses Brazil, Colombia, Argentina and Chile that together constitute 50% of the Latin American tissue market.

John Todd Sarraf, Solenis - global director, on Tissue World Sao Paulo: "We always look forward to participating at Tissue World events.

It not only provides us an excellent opportunity to showcase our latest innovations but it is also a great time to interface with our customers to gain insight on the next set of challenges that we can help them address."

In Sao Paulo Tissue World will set the stage for yet another impactful global event that will combine the strength of the peculiar local industry with our network of international players. Indeed, Sao Paulo will stand out as unique, as all other Tissue World events are, for each one focuses on a different set of regional supply and demand markets and addresses specific industry needs.

Daniel Ohndorf, emtec Electronic GmbH, marketing and sales, on Tissue World Istanbul:

"Tissue World is the place to be if you deal in the tissue industry. It is an outstanding meeting point for the industry heavy-weights and smaller enterprises to share information about the latest innovation and developments in an ever-changing business world."

In the same vein, Tissue World Istanbul will provide the ultimate place of choice for the industry to garner actionable insights from key regional experts on one of the most unpredictable but potentially highly rewarding markets in the world, a region that spans from Russia to South Africa through the near and middle east.

Indeed, Tissue World in these past two years has enlarged the team globally and invested in new resources to make this all possible and meet the ever-evolving needs of the industry. More is to come soon for us to be even closer to the real action, because your success is our success.

manufacturing capacity reaffirms First Quality's commitment to the industry and ensures our ability to meet the growing demands of our customers in a timely and efficient manner".

First Quality Tissue produces ultra-premium tissue and towel products for customers in the United States, Canada and select international locations.

The company has already installed four state of the art TAD machines – two in Lock Haven, Pennsylvania and two in Anderson, South Carolina.

BRAZIL

Sepac starts up new 35,000tpy tissue paper machine

Brazilian tissue paper producer Sepac has started up its newest 35,000tpy tissue paper machine (PM) late in May.

The PM5 was acquired from German equipment supplier Voith in October 2013 and installed at Sepac's sole 95,000tpy paper plant in the city of Mallet, Paraná state, southern Brazil.

The new equipment is designed to reach operating speeds of up to 2,000m/min, producing 100tpy of single and double ply toilet paper with basis weight between 15-19 g/m².

Sepac's administrative director, Renato Tyski Zapszalka, said: "We are currently operating five tissue machines which are working in rotation following our sales strategy.

"However, we expect to have every PM operating at 100% capacity – and thus sell all of our production – by the end of the year."

Once all machines are running at full capacity, the company estimates a total tissue paper production of approximately 128,000tpy.

The PM5 project carried out at the Mallet plant also included the construction of an extra 21m² of work space in the shed area, the expansion of the site's water treatment facility, a new plant for stock preparation as well as three new paper converting lines.

"Together, the three converting lines will meet the new PM's output in order to cut, bundle and bale the paper rolls produced," Zapszalka added.

The total investment in the venture was Real 180 million (\$80 million).

News from RISI (www.risiinfo.com)

Brazilian Ipel postpones tissue PM 4 startup to August

Brazilian tissue producer Indaial Papel Embalagens (Ipel) has rescheduled the startup of its new 26,400tpy paper machine PM4 until August.

Ipel's marketing manager, Luciana Dobuchak, said: "There has been a change in the startup date due to delays in construction, as well as in negotiations with the energy provider."

The project was first announced in 2008 and has been postponed several times in order to prevent the company from incurring debt or taking up large financial commitments.

Supplied by Hergen, the new machine at the company's sole plant located in Indaial city, Santa Catarina state, southern Brazil, will have a 4,880mm Yankee roll and run at a speed of 2,000m/min.

According to Dobuchak, the PM4 will be running at 100% capacity by the second half of August.

News from RISI (www.risiinfo.com)

JAPAN

Tokushu Tokai pushes back schedule for startup of two tissue PMs

Japan's Tokushu Tokai Paper has rescheduled the timeline for two new tissue paper machines at its mill in Shimada city, Shizuoka prefecture.

The firm will erect two identical 18,000tpy PMs at the plant, while retiring two 18,000tpy units at the Yokoi facility, also in Shimada.

The two new 2.2m wide machines were originally planned to come on stream in April 2014 and April 2015.

Their startup has now been pushed back, with the first unit, PM1, slated to be commissioned in October this year, while PM2 is expected to be operational in

December 2015.

The two existing tissue paper machines at the Yokoi mill will be closed prior to the startup of each of the new machines at the Shimada facility.

The cost of the two PMs will total ¥4.2 billion (\$41 million), according to the company.

Tokushu Tokai said that tissue products made on the new machines will have better bulk prosperity with higher absorbency in lower basis weights, compared to the two existing PMs.

It also explained that production at the Shimada mill will be cost-saving.

The company has earmarked ¥8 billion to install a biomass boiler at the Shimada plant, which will enable it to cut spending on electricity and fossil fuel.

Construction work for the biomass boiler will kick off in September this year.

It is expected to come into operation in October 2016.

News from RISI (www.risiinfo.com)

SPAIN

SCA commits to Spain with baby diaper line

SCA is to start up a new baby diaper line at its mill in Valls, Spain.

It will become the first SCA mill in Europe to combine the production of personal care and tissue products.

The company is the world's fourth largest player in the baby diaper segment and holds the number two position in Europe. In Spain, it sells baby diapers under retailers' brands.

The Valls mill will produce baby diapers for the retailer Mercadona's personal care brand, Deliplus.

Magnus Groth, president, SCA Consumer Goods Europe, said: "With this new baby diaper line SCA aims to strengthen its business in Spain, setting grounds for future growth.

"This is proof of SCA's commitment to

SCA to start up new baby diaper line at its Valls mill (pictured)



its business in Spain. It is not only an important announcement for SCA and the Valls mill, but for the entire Valls and Tarragona area."

The baby diaper line is scheduled to start production in the third quarter of this year.

ROMANIA

Petrocart boosts capacity

Romanian tissue producer Petrocart has boosted its capacity after it started up a new Toscotec-supplied tissue line at its Piatra Neamt plant.

It is based on a turn-key concept and will produce an average of 75tpd.

The new line includes the stock preparation plant for virgin and recycled fibres, a MODULO-PLUS tissue machine with single-layer headbox, double press configuration and TT SYD-12FT, and the tissue machine auxiliary plants which include a Milltech hood and steam and condensate system.

TURKEY

Ipek Kagit Tissue boosts converting capacity

Turkey's Ipek Kagit Tissue has successfully started up a new Forte line at its Yalova plant. The move is part of the company's expansion plan to become a regional powerhouse in the international market. Supplied by PCMC Italia, the Forte line will convert high-quality two and three-ply toilet rolls and kitchen towels at high speeds. The rewinding concept is based on a precise winding technology and includes features such as the sectional web tensioning control.

Ipek Kagit manufactures products for the consumer and AfH markets such as kitchen towel, bathroom tissue, hanky, hand towel, industrial towel and toilet roll, napkins.

Founded in 1969 to provide Turkish consumers with modern tissue paper products, it produces consumer brands such as Selpak, Solo, Silen and Servis as well as the AfH brand Selpak Professional for the fast growing tourism catering and institutional customer segments.

Ipek Kagit is headquartered in Istanbul, Turkey and employs 860 people. It has manufacturing operations in three locations: Yalova, Turkey (tissue production and converting), Manisa,

Turkey (converting) and Almaty, Kazakhstan (converting).

Already exporting to 50 countries, the company is now focusing on increasing its international sales fourfold and doubling its total revenue in the next five years through investments in production, technology and marketing.

Ipek Kagit is part of Eczacibasi Group which operates in businesses of building materials, healthcare and consumer products as well as finance, information technology, welding technology, mining and property development and facility management.

Ipek Aktül Kagit Üretim Pazarlama boosts capacity

Aktül Kagit Üretim Pazarlama will install a new Advantage DCT 200 tissue line at its mill in Pamukova, Sakarya province, Turkey. Supplied by Valmet, start-up is planned for the first quarter of 2016. The value of the order will not be disclosed.

With a width of 5.6m and a design speed of 2,200m/min, the new line will add 60,000tpy of high-quality facial, handkerchief, toilet and towel grades to Aktül Kagit's current production.

The raw material for the new line will be virgin fibre.

Erkan Tirnavali, general manager, Aktül Kagit Üretim Pazarlama, said: "In order to be competitive, we want to operate with

"In order to be competitive, we want to operate with cutting edge technology. Valmet's Advantage DCT 200 concept combined .. has proven to meet our expectations and provides high quality tissue products appreciated by the Turkish consumers." Erkan Tirnavali, Aktül Kagit general manager

cutting edge technology.

"Valmet's Advantage DCT 200 concept combined with Advantage ViscoNip pressing technology has proven to meet our expectations and provides high quality tissue products appreciated by the Turkish consumers." Valmet's scope of delivery will comprise of a complete tissue production line including a stock preparation system and an Advantage DCT 200TS tissue machine.

The tissue machine will be equipped with an OptiFlo headbox, an Advantage ViscoNip press and a cast alloy Yankee cylinder.

It will also be featured with the Advantage tissue technology including an AirCap hood, a WetDust dust management system and a SoftReel reel.

Aktül Kagit Üretim Pazarlama has a production plant in Pamukova which covers 140,000 m2 of production area.

The mill provides high quality tissue products for consumers and the AfH market.

GLOBAL

Ashland Water Technologies rebrands as Solenis

Ashland Water Technologies has been acquired by a Clayton, Dubilier & Rice-managed fund and rebranded as Solenis. Prior to the acquisition, Ashland Water Technologies was a commercial business unit of Ashland.

The sale closed 31 July 2014 and included the Industrial Water and the Pulp and Paper business units.

The stand-alone company continues a 94-year reputation as a manufacturer of specialty chemicals for the pulp, paper, oil and gas, chemical processing, mining, biorefining, power and municipal markets.

Its product portfolio includes a broad array of process, functional and water treatment chemistries, as well as state-of-the-art monitoring and control systems.

John Panichella, president and chief executive officer of Solenis, said: "As a stand-alone company, Solenis is better positioned to pursue new opportunities and develop new products that will deliver better value to our customers and result in steady growth and improved margins."

According to Panichella, the company does not anticipate any changes to products, quality or services as a result of the transaction.

Headquartered in Wilmington, Delaware, the company operates 30 manufacturing facilities strategically located around the globe and employs a team of 3,500 professionals in 118 countries across five continents.

Its product portfolio includes a broad array of process, functional and water treatment chemistries as well as state-of-the-art monitoring and control systems. Founded in 1978, Clayton, Dubilier & Rice is a private equity firm that manages \$21 billion on behalf of its investors.



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Coastal China – positive growth through new and upgraded facilities

It is common knowledge that the economy of China has been growing at an accelerated pace for nearly a decade.

The pulp and paper industry has been part of the increased industrialisation fueling this economic picture. Towel and Tissue (T&T) is solidly a part of this overall growth. The regionalism that characterises this increased industrialisation may not be so widely known. The densely populated coastal provinces have been the concentration area for industry and these regions are clearly outpacing the interior and western parts of the country when it comes to investment and development in the recent past. Figure 1, a trend plot depicting the percentage of China's T&T growth that is occurring in the coastal area versus the remainder of the country, illustrates this point. Historically the bias has been 65% by 35% coastal area versus remainder of the country. The coastal areas spiked above 80% during the latest period of accelerated growth. At nearly four million metric tonnes, the coastal area represents 70% of China's

T&T production.

Reports from the media suggest China is attempting to shift some of the growth into the interior and western areas. The T&T trend plot (Figure 1) supports these reports in that the split is pulling off the peak and indicates increasing percentage in the non-coastal areas.

This article considers China's Northern and Southern coastal areas. Coastal China's T&T mills are geographically dispersed throughout the region's provinces with the heaviest concentration being in the Southern portion (Map 1). The two coastal areas combined represent a concentration of T&T production unmatched by any other Asia Pacific region (Figure 2). In terms of sheer numbers, more than half of the 645 machines in the Asia Pacific reside in this part of China (Figure 3).

T&T machines in the Asia Pacific region vary from narrow one metre machines to six metres. Machines in Coastal China are similar in terms of the trim range for the region, with the average being slightly less than three metres (Figure 4). Mill pro-



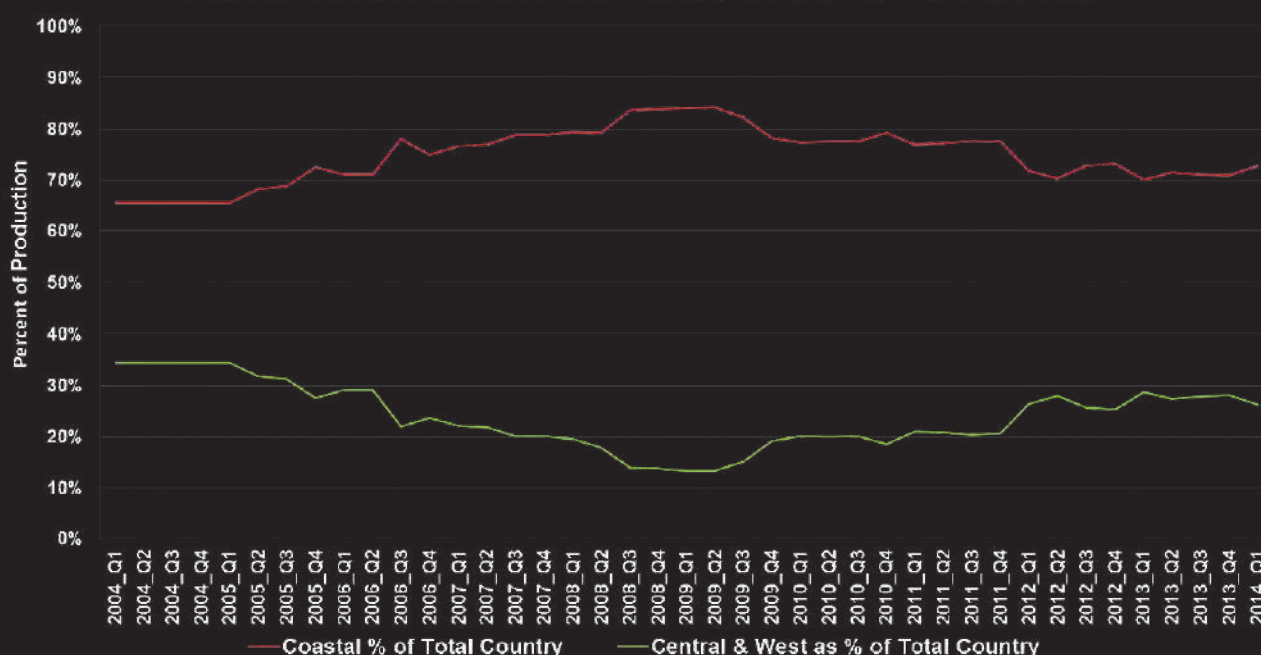
Bill Burns

Senior consultant,
Fisher International

duction in Coastal China is, on average, on the high side compared to other producing countries in Asia Pacific with capacities in excess of 60,000 MTPY while the technical age of Coastal China's machines is significantly below average (Figure 5). Coastal China's cost position in the region is average with advantages over some countries in energy cost while holding a disadvantaged position in fibre cost (Figure 6). Fibre mix in Coastal China mills is 90+% market Kraft pulp with very little recycled being used (Figure 7). While recycled fibre is present in many countries, there is a regional preference for virgin fibre. There are some countries with significant use of secondary fibre, but these mills are serving much smaller, regionally focused markets.

Figure 1

China T&T 10 Year Production Dispersion Trend
Percent of Production in Coastal versus Central and Western Areas



645

Machines
in the Asia
Pacific, of
which more
than half
reside in this
region of
China

60,000
MTPY

Mill
production
capacity in
Coastal China

90+%

Fibre mix
of market
Kraft pulp
in this
region

Figure 2

Asia Pacific T&T Production

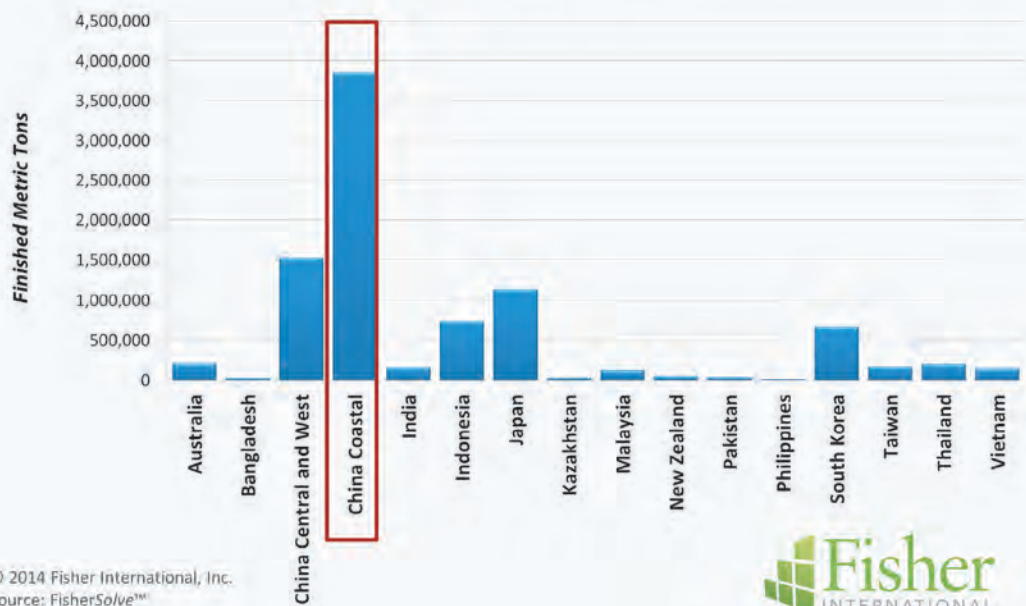
Fisher
INTERNATIONAL

Figure 3

Quantity of Asia Pacific T&T Machines

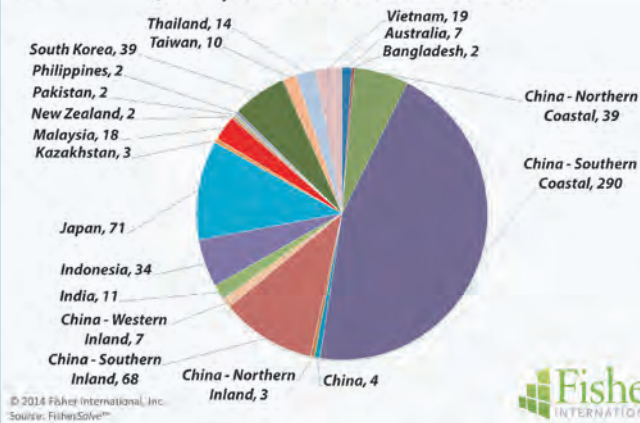
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Figure 4

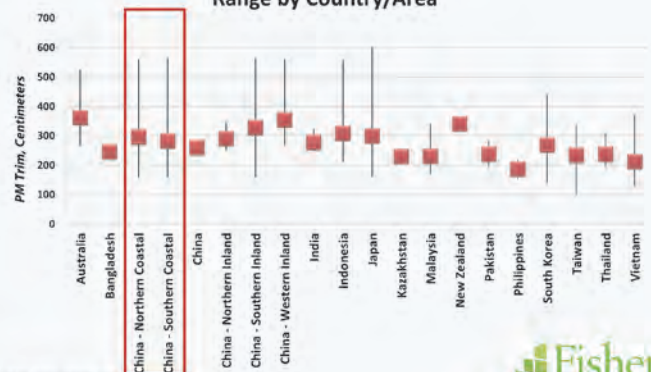
Asia Pacific T&T Machine Trim
Range by Country/AreaFisher
INTERNATIONAL

Figure 6

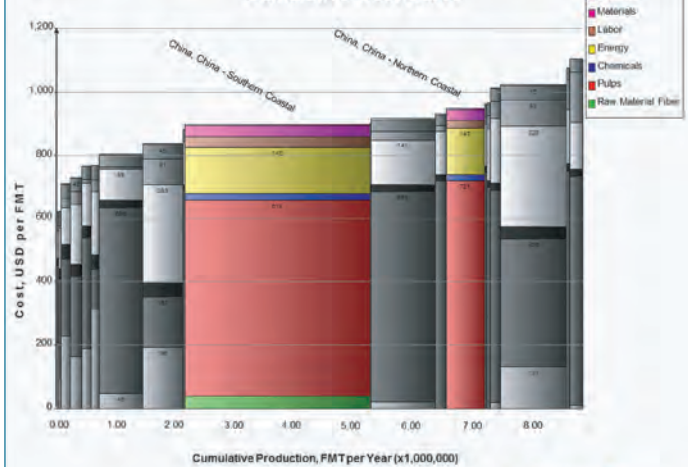
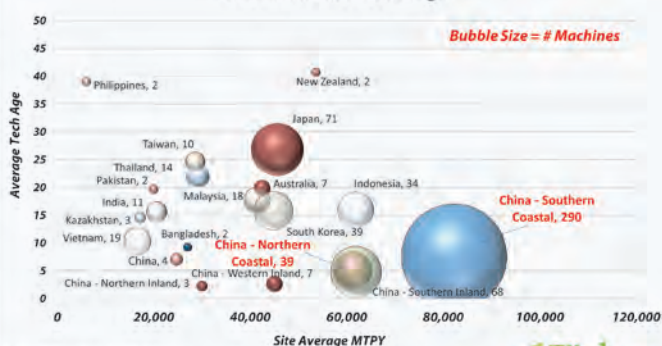
Asia Pacific T&T Producing Countries/Areas
Cumulative Cost CurveFisher
INTERNATIONAL

Figure 5

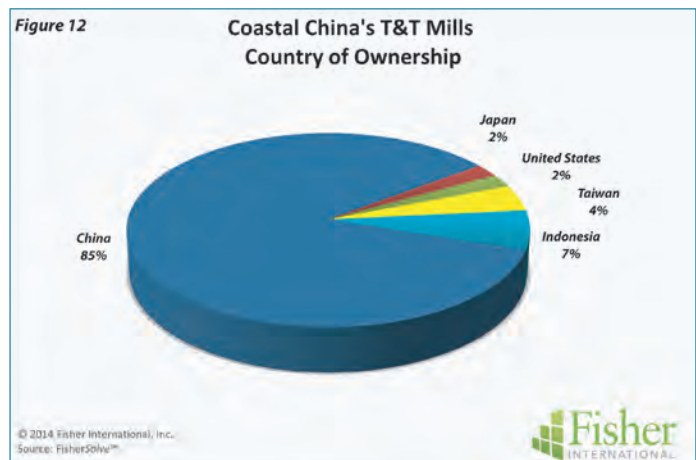
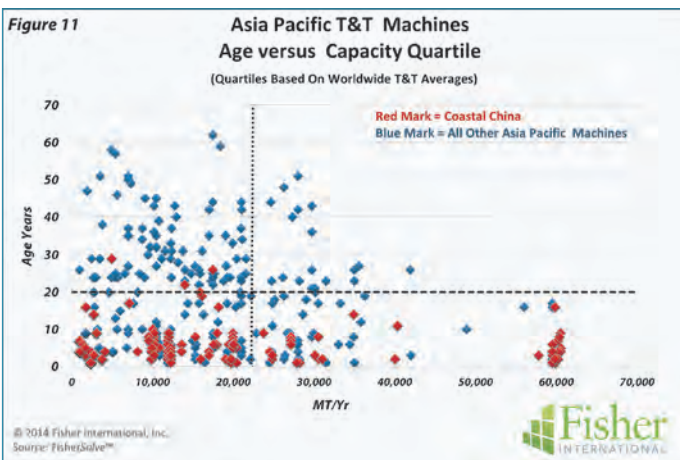
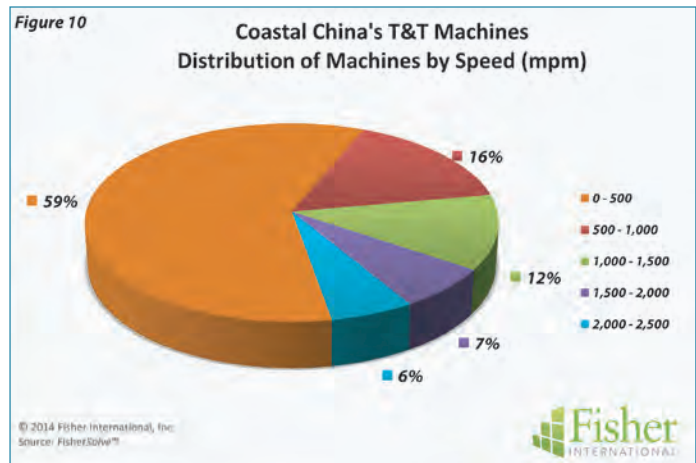
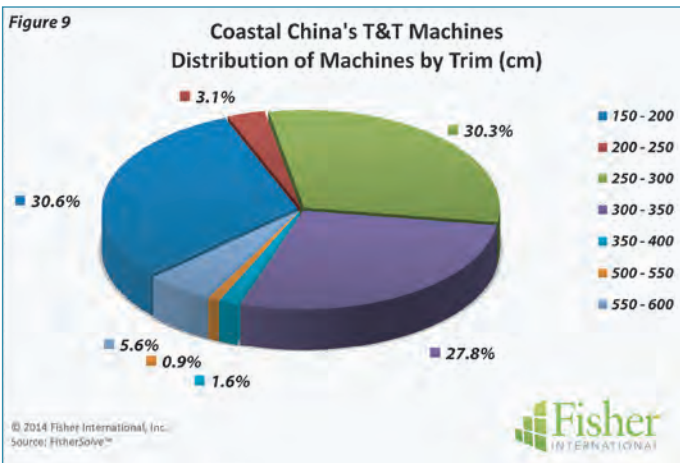
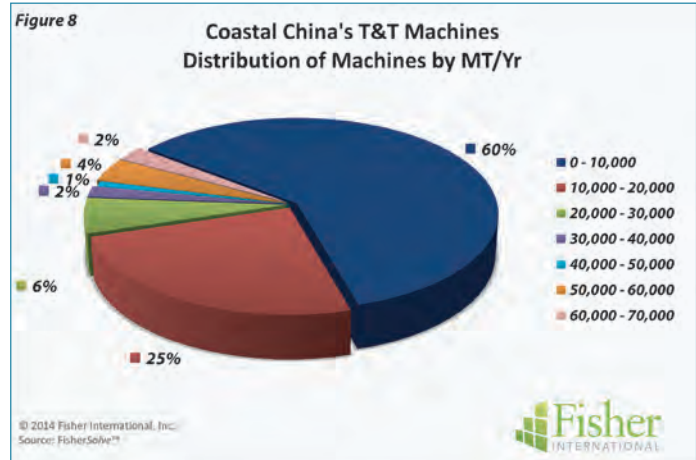
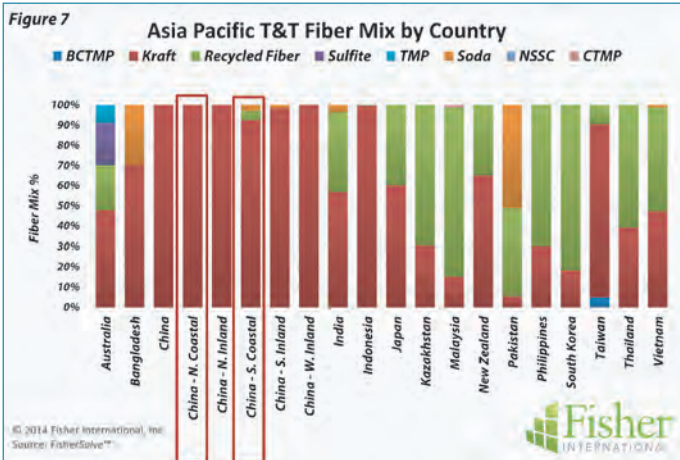
Asia Pacific T&T Machines by Country/Area
MTPY versus Tech AgeFisher
INTERNATIONAL

Coastal China's T&T machine production rates are heavily weighted (approximately 80%) to machines ranging among the smallest, producing less than 20,000 MTPY. Less than 10% of the machines are among the more capable machines producing above 40,000 MTPY range (Figure 8). Machine trims are narrow with more than 90% of the machines being less than 3.5 metres (Figure 9). Only 7% of the machines are in the wider 5.0 - 5.5 metre class.

Machine speeds are modest with more than half under 1,000mpm and only 15% above the 1,500mpm mark (Figure 10). Capacity-wise on the international scale, Coastal China's machines concentrate below the worldwide average technical age but also production rate. However, there are a goodly number of new machines in the new high capacity category (Figure 11). T&T mill ownership has some international players, but the ownership

is predominantly local with 85% of the mills being headquartered within China (Figure 12).

Fisher International has recently added a carbon database and benchmarking tool in FisherSolve™ which models the pulp and paper industry. Carbon modeling results for mills in the Coastal Areas of China indicate a weighted average cradle-to-gate emissions of 1.684 and 1.784 MT CO₂-eq/FMT for Southern Coastal

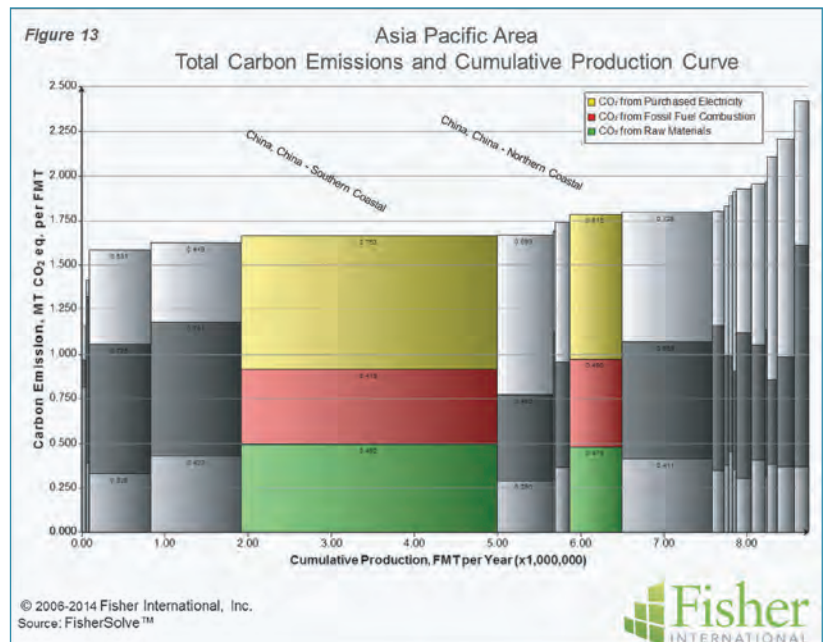


and Northern Coastal China respectively. Comparatively, the worldwide weighted average for T&T is 1.613 MT CO₂-eq/FMT (Figure 13).

The source for market data and analysis in this article is FisherSolve™. Data tables behind Figures 1 - 13 can be obtained from Fisher International. E-mail requests to info@fisheri.com.

3.5
metres

Machine trims that
make up some 90%
of machines in
the coastal region



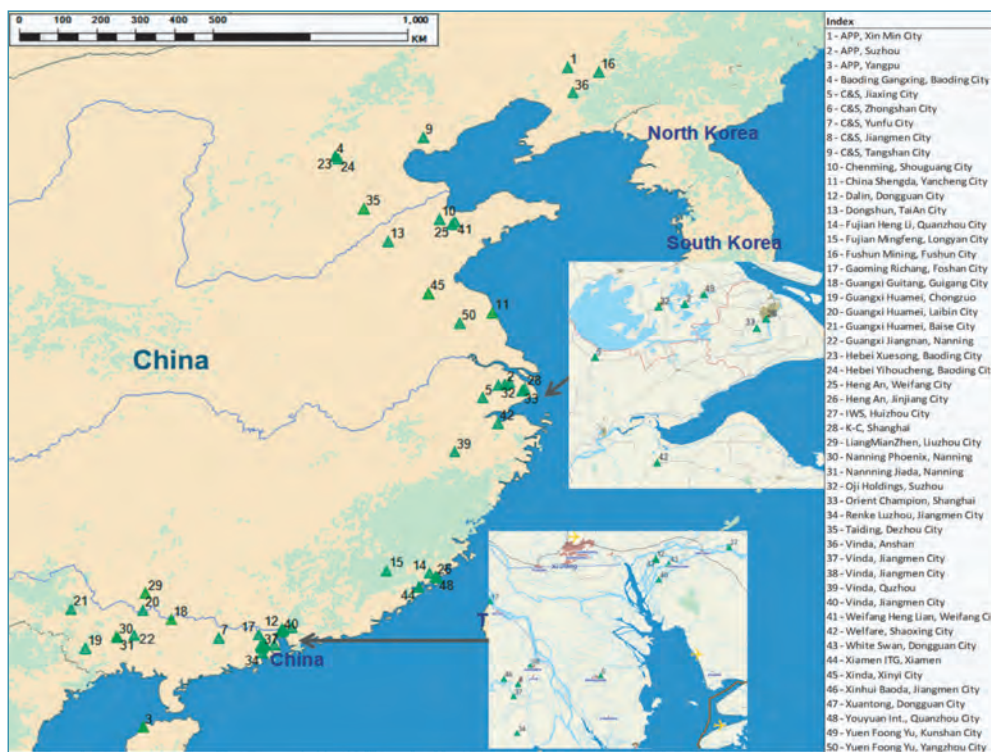
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China's Coastal Operating T&T Mills



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Source: FisherSolve™

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7%

Machines
in the
wider
5.0-5.5
metre
class

1,000
mpm

Speeds of
more than
half of
machines
in the
region

85%

T&T mills
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East China: tissue at a crossroads

The vastness of the Chinese consumer market is sometimes difficult to appreciate but even if we take a fraction of the country's landmass - Eastern China, with a population of 300 million (roughly equivalent to the US) - its retail tissue market ranks as the world's second largest in terms of volume. In 2013, the region accounted for 1.2 million tonnes of retail tissue sales, which although lagging somewhat significantly behind the US at 4.5 million tonnes, still far surpasses that of third ranking Japan, at 0.7 million tonnes.

Such large volumes have been driven by Eastern China's position as the economic powerhouse of the country, a region which boasts some of the most prosperous consumers and also densely populated urban areas in China.

Tissue sales in first tier cities in the region such as Shanghai are - at least in volume terms - very similar to that of more mature markets, such as Japan for example. In 2013, total retail tissue per capita consumption across the East China region was 5.5kg, opposed to the 8kg average in Japan. Indeed, if the current 10% CAGR per capita volume growth is maintained, average consumption in the East will be on par with Japan's by the end of the decade, which is nothing short of stellar growth considering consumption stood at just 2kg at around the start of the millennium.

New capacity and consumption plateau

While all the signs are very positive, and in some way justify the huge investment in new capacity which has taken place over the last decade, the Chinese tissue market, with East China as the key driver, is not without its problems. With growth in consumption much slower in more outlying regions, there is pressure on the East to soak up yet more volume. Unless manufacturers are successful in their attempts to develop a much broader portfolio of tissue consumption, the already plunging utilisation could still go lower if the combination of further capacity increases marries with faltering consumption in the East.

As with other emerging markets, Chinese tissue brands have a fight on their hands to take a share of consumer expenditure, especially amongst their prime consumer group, namely the urban middle classes, for whom tissue is perhaps less alluring than other products. It's a cold harsh world of competition out there and what is commonly referred to as the 'middle class trap' is quite apparent in Eastern China and appears to be affecting Chinese tissue prospects just as much as it is in Mexico or the UAE, for example. How to convince consumers that tissue is worth the investment, and especially more premium products, when basic needs have been met?

Units prices head south

This is all the more difficult when the industry has appeared in many quarters to have done its level best to commoditise

the sector in its desperation to shift volumes.

Price competition is affecting key tissue categories, consumers are savvy and quite prepared to shop around and bulk order to get the best prices and even for tissue products the search for a bargain is increasingly going online. Add to this the failure to develop kitchen towel as a mainstream product, then the Chinese market in its most developed region appears to be on the brink of going backwards in terms of unit price.

This is all the more surprising given the fact that private label is pretty much non-existent, given the lack of significant chained retailers groups.

Indeed, the fact that hypermarkets such as Walmart actively look for high income areas for store location has counted against private label having any chance of gaining a foothold, which is just as well given the rampant competition which has seen the unit price of branded product eroded quickly.

This downward pressure on pricing may have a silver lining, with margins narrowing producers appear to have put a break on new machine orders and delayed some openings and the phase when anyone and everyone (even mining companies) moving into tissue production appears to be nearing an end.

Margins narrow

Collapsing margins may also be effective in helping to speed up the pace of industry rationalisation. To date, the national government's policy of closing smaller plants has made some progress but only slowly; still, in 2013 more than 50% of national tissue production reported by the CNHPA was classified as unscalable, and made up of a myriad of small producers.

"Price competition is affecting key categories, consumers are savvy and shop around and bulk order ... and even for tissue products the search for a bargain is increasingly going online."



Ian Bell



*Euromonitor International's
global head of tissue and
hygiene research*

The prospect (at least nationally) for larger producers to move into this space is clearly of great significance but it would appear that there will be some short term pain as the market moves into a more modern phase. The interesting question remains: is there something about Chinese consumers that will support higher per capita consumption and help to soak up some of the overcapacity forecast through to the end of the decade? This may well be the case but volumes will be driven by price cuts which may be difficult to reverse, longer term.

"It seems that international brand owners, used to a premium area of the market, will have to do a great deal of work to win the hearts and purse strings of consumers."

There is a strong indication that in terms of consumer perception of pricing the genie is already out of the bottle and consumers used to moderate quality and low pricing will be very unwilling to accept anything else for what is already a commodity category.

As the adage goes 'treat it as a commodity and it will become so' and with the internet offering large volumes and low pricing it seems that international brand owners, who are used to a premium area of the market, will have to do a great deal of work to win the hearts and purse strings of consumers. The evidence from Germany, where hard discounters and private label did a similar 'axe job' on the tissue market, is that they are likely to struggle in this endeavour.

A new frontier

There are some welcome signs that a few major manufacturers are addressing commoditisation, however. For example, SCA's (Vinda) invested in its Tempo facial tissue brand, especially in the modern grocery channel, across the region to get its soft pack and boxed tissues

launched at the end of 2012, resulting in a wide retail presence. Tempo, with its three layers and heavily promoted on softness and strength, were priced at nearly twice the market average.

Kimberly-Clark has also battled to occupy more shelf space in this region, promoting itself as a cut above other products. A more premium footing has not only been the reserve of international players, with Yuen Foong Yu Paper Enterprise employing a more creative approach to advertising for May Flower-branded toilet paper, which occupied a strong position in East China. A series of watercolour pictures painted on May Flower toilet paper were exhibited in Shanghai, an 'avant-garde' approach to promoting its strength and absorbency.

There is also evidence in the East that manufacturers are looking to expand consumers' portfolio of products, with kitchen towel an important next step for the tissue industry and its pursuit of modernisation. For example, brands like Hygienix and Virjoy were launched as low-end products over the past few years in an attempt to provide an entry level platform, an attempt to move the category into the mainstream and away from the high income urban professional niche which has limited category growth to date.

While kitchen towel is the next important step for the tissue industry to take, institutional sales also show some promise. Away from Home is still fairly underdeveloped even in the East and as the arrival of SCA with its purchase of Vinda (another experienced player in the field) the AfH tissue market will likely prove a key area for development away from the overheated and overexposed retail tissue market.

"There is also evidence in the East that manufacturers are looking to expand consumers' portfolio of products, with kitchen towel an important next step."

300m

East China population

1.2m
tpy

2013 Retail sales

10%

CAGR per capita
volume growth

5.5kg

Per capita
consumption 2013

By Helen Morris Tissue World Magazine editor

New tissue player Sun Paper targets top five position in 10 years

China's largest privately owned paper maker, squeezed in its traditional market, is moving powerfully into tissue production. Improving consumers' low brand loyalty and getting logistics and distribution to work effectively are top priorities, Sun Paper's general manager Kevin Liu tells TWM.

"One of the main challenges in the Chinese tissue market is the lack of brand recognition from consumers," Sun Paper general manager Kevin Liu tells TWM from the company's Yanzhou-based office. "It takes a long time and a lot of effort to get a brand well established and recognised. The second main challenge is getting logistics and distribution to work effectively, and this takes time also. Our strategy is to invest so we can create a very solid market position with a strong and recognisable brand."

Despite being China's largest privately-owned papermaking company (its annual pulp and paper production capacity is four million tonnes), Sun Paper is new to the tissue sector having started up its first tissue PM in June this year. It has made its ambitions in the tissue industry public when it said it will become one of China's five largest tissue producers within the next 10 years.

"We've been planning to go into tissue for years," Liu says in near-perfect English.

"We have no choice. This is a crucial sector for the long term development of our business."

Established in 1982, Sun Paper's business now includes papermaking, chemicals, foreign trade, power, scientific research, forestry and pulp, hotel, investment, textiles and food. It has sales of 23 billion yuan and more than 10,000 staff. Its foundations as a pulp and paper manufacturer for the printing industry has been an advantage in setting itself up for the tissue market: "While we're late into this sector, our knowledge of the consumer business and tissue production have positioned us well in it," he says. "We continuously study consumer and market trends and as a result our product is very marketable. While we are still small in tissue, we will be expanding rapidly through investment and also diversifying our product range. We have achieved more in three years than competitors have in 10."

As profits for paper manufacturers in the printing industry are squeezed around the world, Liu adds Sun Paper is one of the few paper companies still making profits in the



Editor,
Tissue World Magazine

printing paper business in China. Yet he says its profitabilities have been "squeezed significantly" compared to years ago, while there have been opportunities in tissue. "There's substantial overcapacity and the impact on the printing industry from the internet has really made an impact," Liu says. "So we diversified. Household tissue paper, diapers.. these areas have lots of potential as they're driven by urbanisation and improved living standards."

In June 2014, Sun Paper moved into tissue production with the start-up of PM27 at the Yanzhou site



By Helen Morris Tissue World Magazine editor



General manager Kevin Liu with the company's Sun Elements range

Despite China's massive population, per capita consumption of tissue is currently just 4.4 kilos compared to neighbouring Japan at 15 kilos. In China, there is also tonnes of overcapacity. "The aim for 2020 is that per capita consumption is 10 kilos," he says. "The tissue industry here is just starting, it's like the printing industry was 10 years ago. Now we're seeing more buying power from consumers and these trends are a result of urbanisation; many people in China didn't use that much tissue, but now more and more people are moving to the city and adopting a more varied culture of tissue product use."

This changing dynamic is seen even in fourth and fifth tier cities: "People are changing the way they use tissue, we are definitely seeing an increase in high-end products," he says. "China is very different from the UK and other stale marketplaces. Sizes here aren't standardised and we are also seeing different uses of tissue products across the country: in the north, people like multi-purpose products and 50% of the usage is to clean the table, so the quality of the tissue is very different. Coreless toilet paper products have 50% of the market share in northern China."

Besides coreless tissue, he says the unique nature of soft pack facial products in terms of their fast growing and multi-functional uses in China, has taken lots of share from box facial and even handkerchief facial. "It is also a main reason why kitchen towel is not as popular as it is in the western world", he says.

There are still very few high-end products that are based on raw materials and Liu says



PM27 has a width of 5,62m and a design speed of 2,000m/min. Next year, an identical machine is also scheduled to start production

it's another area of interest. He believes the use of straw pulp is being faded out and won't be used at all in 10 years time. As for recycled pulp, China's lack of a systematical recycling system means demand for recycled products isn't there: "It will come in time but at the moment, consumers don't like recycled products and we aren't seeing any demand for recycled pulp products here. Consumer behaviour in China is 80/90% from virgin pulp."

Unlike in Europe, Liu says private label has no chance of dominating in China. "Brands will stay the major business," he says. "Private label will develop here but I don't believe that in big cities it can be a dominant force. Private label is just getting started here, it has less than 5% of the market. It's growing, but ecommerce affects this business. Ecommerce is growing very quickly and is aggressively taking share from the supermarkets."

Following intense consolidation over the

past few years, Hengan and Asia Pulp and Paper claim the number one and two spots in terms of market share in Chinese tissue production, but Liu believes that opportunities to lift capacity and consolidation have been missed. He adds that while Kimberly-Clark is number one in the world, in China it just focuses on diapers. SCA, he adds, has "a very clear strategy" with its move further into the Chinese market through Vinda: "SCA comes from a sustainable point of view which it has built up in Europe, and this is certainly a long term advantage for them. Vinda wasn't a big company before but it had a reputation for quality bathroom tissue."

With the rapidly changing market dynamics, there was "no question" Sun Paper needed to have the most advanced technology. In June, it started up PM27 at the Yanzhou mill in Shandong province. Supplied by Andritz, it has a width of 5,62m and a design speed of 2,000m/min. A second identical PM is scheduled to come online at the site in

A range of end products





Production at the mill

early 2015 and both PMs will produce 60,000tpy of high quality facial and toilet paper. Converting facilities were started up in September 2013 and production at the end of next year is expected to total 140,000tpy.

The long term strategy of a business is very important in the Chinese market: "Competitors such as SCA, they are very experienced with a strong research team, but we know the Chinese market which is an advantage for us. We already have a series of new products and we will launch them in the next few years and target the third, fourth and fifth tier cities. Consumers in Shanghai, for example, are loyal to fancy brands."

He adds the mid-term strategy also includes participating in industry consolidation through merger and acquisition or partnerships with international brands or cutting-edge technologies for tissue, diaper or sanitary towels which he says will compliment the

organic growth from start-up to regional brand.

Export also makes up a part of the Sun Paper business and the company brings raw material in from abroad to process and prepare for re-export into the USA, Japan and South Africa. "In the USA, it's a flat market, but it's still a big trading platform for us," Liu says. "We also look to trends there and in the Japanese market. For example, the product structure is very dynamic in Japan. It's our mid-term business strategy after our focus on China and export of finished products and establishing our brands."

While Liu admits he doesn't like the price war in the market, he says it's an opportunity for the business as it's also a large pulp producer with its own power plant, which is a cost advantage. "Brand loyalty here means it's difficult to take from the big players as a new player," he adds. "So we are directly competing with the brands already established. The cost will be high .. getting onto the shelf space is very difficult but we

will spend more money and time with this. We're innovating as well, producing products with scent. We're improving product quality as well as bringing down the cost."

He says as the company is growing very quickly, consumers are getting used to seeing the company's brand. "We are investing a lot in creating brand recognition and are aiming to build it as a regional brand in the next few years. Brand loyalty here is very low, tissue is largely a functional product here. But we have a consumer business background which helps us with the distribution of our products. We are confident we will win the game and how we differentiate our product is to do with the Chinese consumer."

The culture of "traditional China", he says, that doesn't use many tissue products, is still strong but it is changing. "Urbanisation isn't completed yet. The route to market is still largely through traditional markets. But there is a lot of change and with that comes opportunity."

PM27 produces 60,000tpy of high-quality facial and toilet paper





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By Helen Morris Tissue World Magazine editor

Moving into tissue with a 2bn RMB investment means Hebei Yihoucheng is packing a punch

General manager Tian Yuwei epitomises China's economic drive with advanced technology in place and planned, a top class targeted product, and a strategy aimed at changing the tissue culture across a vast region of the country.

"Our strategy is to take a large portion of the facial tissue market in northern China," Hebei Yihoucheng general manager Tian Yuwei tells TWM from the company's mill in Baoding, Hebei, two hours drive from Beijing. "Unlike southern China, there is plenty of potential growth there for this market. In the next few years, we will be leading the market there."

Set in rural China, the approach to the plant is along little more than a dirt track either side of which overhangs rows of peach trees struggling under the weight of the giant red and orange fruit. The company's proximity to nature is echoed throughout the mill: on-site staff grow vegetables; sunflower beds are dotted amongst the paper machine and waste water treatment

facility, and the plant is also the first tissue mill in Baoding to use gas instead of coal to generate power. The site is located over 600 (Chinese mu) acres - and there is plenty of room for expansion.

Primarily a manufacturer of mats for pets, sanitary products and wet-wipes, Hebei Yihoucheng entered the tissue market in May 2014 with the start up of 25,000tpy Andritz-supplied PM1. A second 25,000tpy tissue PM will start up next year while PM3 and PM4 are coming on stream in the next four years as part of a 2bn RMB investment that aims to produce 200,000tpy once completed.

The move into tissue comes after 16 years experience in the sanitary products market, something Yuwei says is vital for



Helen Morris

Editor,
Tissue World Magazine

a successful diversification into tissue: "It was a necessity for us going into the tissue market. Overcapacity here is resulting in

Yuwei (left) with Günter Offenbacher (Andritz director of sales for tissue and drying)



By Helen Morris Tissue World Magazine editor



The company's Baoding-based site which started tissue production in May 2014

fierce competition and price wars. One of our main strategies to tackle this has to be through our brands and having a strong brand already established in a sister industry is key. We have gone into the tissue market very boldly; it's been a big advantage for us to already have an established brand."

The company's ambition is very evident, yet Yuwei himself is quietly spoken and unassuming. Speaking through a translator, he says the company has needed to invest a lot of money in tissue. "We are new to the sector, but we are starting off high and with the best technology. This means we can be one step ahead of the game."

The Andritz-supplied PrimeLine COMPACT

PM1 with PrimeDry Steel Yankee has a speed of 1,650m/min and a width of 2.85m and is the first of its kind in China. PM2 has been ordered from a Taiwan-based supplier and will produce high quality facial tissue products.

Some 20% of the plant's total production is for toilet paper and facial paper. The focus on facial paper is a result of a gap in the market as well as a competitive move in an overcrowded marketplace, which has resulted in "an inevitable" price war.

"Our strategy against the price wars in China is our product," he says. "North and south are very different consumers: in north

China, they want a product that is tough and not easy to tear. There, toilet paper is a very versatile product and is used all over the house, including at the dinner table. However in southern China, a soft product is preferred and it tends to be used solely for the bathroom."

Brand identity is key: Hebei Yihoucheng has established a new tissue brand through Ni Hao, a four ply toilet tissue product that Yuwei says is unique and of high quality and softness. "We have listened to the market and responded to create a tough and soft tissue product that we are putting into the northern Chinese market," he says. "Facial tissue is one of the main markets in China

View over the company's waste water treatment facility where the environment is high on the agenda



By Helen Morris Tissue World Magazine editor



Tissue on the reel

and the paper makers that are already in it don't have the advanced machinery technology that we do. We want to be the leaders of this type of product in an area of China that doesn't yet have this culture. With such innovations, we think we can win the price war."

The company's second strategy for dealing with the price war is to increase facial tissue production. "The Chinese economy is growing and growing, especially in southern China," he says. "Demand here is increasing and in southern China people are using more and better quality toilet tissue in the bathroom. We are focusing on the second and third tier cities rather than the very largest first tier. There is also export potential but not for facial tissue. If we produce more than we need we will



Converting processes at the plant

export and we already export hand towels to Japan."

Yuwei says consumers show little brand loyalty to tissue products and that brand marketing is very heavily won with celebrity endorsement. Consumption isn't seasonal and is steady despite the change in seasons.

The environment is also a key strategy: regulations set up by the government over the past few years have had a domino effect across the tissue industry. Yuwei says: "It has been a big challenge for smaller players in the tissue industry and this has resulted in many of them closing down. With overcapacity in the market, the mills that are closing are largely producing low quality products at

low prices, so we believe it is a good thing for competition."

For Hebei Yihoucheng, the regulations "are an opportunity". "We want to push these weaker players out of the market and we are doing that by introducing high quality environmentally-friendly products that are available at a good price. With our experience in the sanitary products market, we have a head start," he says.

"Environmentally-friendly products are the future and we will continue to invest here. We also want to change people's lifestyle by promoting facial tissue and improving the quality of it so that we can make a good profit. In this sector we can sell facial tissue at a higher price than toilet paper, so the margins are better. It has the biggest potential for us."

Tissue production started on the Andritz-supplied PM1 in May 2014





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By Helen Morris Tissue World Magazine editor

APP balancing overcapacity while positioning for huge potential growth

China is grappling with an overheated market, too many PMs, ageing plants, a dangerous price war, sustainability, shifting consumer demands, and impressive 8.8% average annual growth which could soar again into potential new regions. Here Evelyn Hu, CEO of Asia Pulp and Paper's China tissue business unit, explains her company strategy to TWM.

Gold Hongye (GHY) Paper Group's mill in Suzhou, an hour and a half's drive from Shanghai, packs a significant punch in an industrial park full of China's heavyweight manufacturing companies. The site is home to a staggering 10 tissue machines and 161 converting lines, producing 264,000 tonnes of base paper per year.

The plant is a division of Asia Pulp and Paper (APP) under the Sinar Mas Group. Over the past few years, APP's tissue expansion into the region has been nothing short of jaw dropping – it had intended to build a total of 52 new tissue machines at mills in China and Indonesia. However, in May it announced it was putting the brakes on its aggressive expansion path, with machine installations due to come on stream after 2015 delayed for a year. Other PMs have been dropped altogether.

Since 2006, GHY has set up eight processing bases located in Tianjin, Shenyang, Chengdu, Wuhan, Fuzhou, Guangdong, Hainan and Qingdao. Currently, the division produces 800,000 tonnes of base paper for household paper per year and processes 600,000 tonnes of finished products annually. Evelyn Hu, chief executive of APP China's tissue business, talks to TWM about what's next.

1. What trends are you seeing in the Chinese tissue market?

Evelyn Hu: "According to the latest data published by China Paper Association (CPA), the national consumption of household paper in 2013 has reached 7.34 million tonnes and the average annual growth rate from 2004 to 2013 is 8.82%. However, average annual consumption of tissue paper in China still has a large gap compared with developed countries given its giant population.

"Generally tissue paper markets in second and third tier cities have been experiencing rapid growth, as people in these areas have not only shown increasing demand for different types of tissues but also pay

more attention to the quality of tissue products. So the Chinese market still has great potential for growth."

"As for the overall tissue market, more and more consumers have raised their requirements for quality of life and at the same time deepened their knowledge about tissue. They have started to see that there are different uses for toilet paper compared facial tissue. According to A.C. Nielsen data, the average increasing rate of removable facial tissue is higher than tissue as a whole, and kitchen tissue ranks as one of the fastest developing fields."

2. How are you dealing with overcapacity in the Chinese tissue market?

EH: "The problem of overcapacity at present is largely because the industry is entering into a concentrated period of production release. However, it is believed that as market demand keeps climbing, a balance could be achieved between demand and supply. This moment represents a significant phase for knocking out backward capacity. For us, it is the best way to cope with the challenge by underlining improvements on product and service quality while enhancing its strengths at the same time.

"Respect for market rules is also essential for solving overcapacity. Gold Hongye has advocated a "tracking system for daily



Helen Morris

Editor,
Tissue World Magazine

production and marketing" among all plants since 2010. In virtue of the system, plants are enabled to adjust production rate in line with instant analysis regarding production prediction, inventory and progress of shipment. In this case, it is feasible to rationalise production scheduling, solve overcapacity to some extent, and thus lead the industry to develop in a more healthy and sustainable way."

3. How are you protecting your brand identity?

EH: "Brand is one of the most valuable assets of the company and Gold Hongye attaches great importance in protecting existing brands. We have registered appearance patents for all the packaging

Gold Hongye's office building in Suzhou, an hour and a half's drive from Shanghai



By Helen Morris Tissue World Magazine editor

five major guarantees, while each of the guarantees is recognised by authorised organisations. Not all the manufacturers in China can behave as responsibly as we do.

"As for the new brands, Gold Hongye is committed to satisfy consumers continuously increasing demand and develop products they will adore and choose."

4. What is the potential for export in the Asia Pacific region?

EH: "Among all the consuming goods, tissue products are the closest to the consumer. Therefore, economic development, improving living standards as well as changing consumer habits all increase tissue consumption. As an important emerging market, tissue consumption in the Asia Pacific area is estimated to keep growing.

"Per capita tissue consumption in Macau, Hong Kong, Australia and Japan has all exceeded 14kg, which is equal to western Europe, while Singapore and Korea have also hit 12kg and 10kg respectively. Considering the economic development and large population, these markets still have huge demand and great potential for export."

5. How much of your finished production do you export and are you looking to increase this?

EH: "It has been over a decade since Gold Hongye started to export products and it has gathered sound experience so far. In the last few years, with the improvement

Gold Hongye's paper processing company's pocket facial production line



TM1 at the company's Suzhou site

of the company's overall production capacity and overseas expansion, our export volume has gone through a continuous increase as well. For instance, the export volume for the first half of this year saw a large rise against the same period last year. Considering the global tissue market, a comparative increase is expected to be seen. Therefore, Gold Hongye will elevate its export volume further by taking advantage of its strengths."

6. There has been a huge investment in capacity in the East China tissue industry – what investment plans does APP have?

EH: "At the moment, the domestic production capacity of tissue is at a comparatively saturated phase. We need

to carry out further research and analysis before making any decisions on the future investment plan and focus.

"APP's future investments will be made on two main aspects: firstly on the expansion of plant construction as well as equipment replacement; secondly on the building of Suining and Ya'an papermaking factories in Sichuan province and their going into operation."

7. What efforts are you making towards environmental sustainability at the plant and across China in general?

"APP-China is one of the most active advocates and practitioners of the plantation-pulp-paper integration and has already initially formatted a green circle of the collaborative circle among plantation, pulp and paper, by planting forest, making pulp in an environment-friendly approach and then producing quality paper products.

"In regards of Clean Production Management, major pulp and paper mills documented under the scope of APP-China's report all followed the fundamental principles of environmental friendly pulp making and green paper manufacturing.

"Gold Hongye has always adhered to a strict cleaner production standard. It is equipped with a dust-free, environmentally friendly power plant and also owns a modern sewage

By Helen Morris Tissue World Magazine editor

treatment works. Gold Hongye Paper has received ISO 14001 and ISO 9001 System Certifications and PEFC-COC Management System of Timber Chain of Custody. It is currently one among a handful of paper manufacturers to use clean energy generated by the sun. With 20MW of installed capacity, it uses roofs of existing factories to install solar photovoltaic panels for the generation of solar power. The total area includes over 200,000 square metres, with 18 million kWh of annual energy output."

8. How is the changing class structure in China changing the tissue market?

EH: "Since the Reform and Opening-up, residents in both urban area and rural area have witnessed an increase on their per capita income, so is the proportion of disposable income. The improvement of purchase power encourages the tissue consumers effectively, and consumer's demand about specified and diversified paper is increasing too. A variety of paper including toilet paper, facial tissue, pocket tissue, kitchen paper and wet tissue is now developing fast in place of just one type as before."

"As consumers are increasingly focusing on life quality, their pursuit towards tissue is also changing. The differences lie in: a continuous development on high gram weight or high unit price and high quality roll paper; removable tissue developing from two-layer to three-layer; handkerchief also developing from two/three-layer to four-layer."

9. Are you seeing any increase in private label production in East China?

EH: "In recent years, more and more global retailers have constantly increased



Gold Hongye's paper processing company's box facial production line

their market share of private label goods, while some of them have already engaged in tissue products. Gold Hongye is cautiously optimistic in the potential of this field and pays close attention to that."

10. How is price competition affecting key tissue categories?

EH: "Gold Hongye is committed to the R&D of new products, seeking to meet consumers different needs with differentiated products. Meanwhile, we are in pursuit of enhancement on consumer loyalty by establishing outstanding brand image, so as to prevent ourselves from a price war."

"Consumers have always looked for cost-effective products. As a large manufacturer, it is suggested to lead them to achieve a balance between quality and price instead of paying attention to price only but neglecting quality."

11. What are your top three concerns for the East Chinese tissue market in the next few years?

EH: "Demand for tissue in East China's market in recent years has greatly

increased and will still increase over the next few years. However, we are concerned that some manufacturers will continue to produce mixed pulp products that will decrease the consumers requirement for high quality products."

"There is also fierce competition that may lead to lower priced products, thus price competition will raise and ultimately harm the whole market. Lastly, the developing pace in East China is currently slow, for the overall economic status affects this area more significantly than inland areas."

"We are finding that consumers are becoming more and more demanding regarding tissue products' safety, hygiene and quality, as a result of continuous improvement of their income level and living standard. Gold Hongye regards this as both a challenge and an opportunity to further develop in the market."

Technical control staff testing the content of available chlorine



Factfile: Gold HongYe (GHY) Paper Group

Parent company: Sinar Mas Group

Location: Suzhou, China

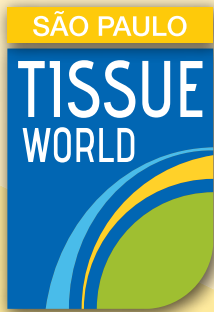
Established: 1996

Paper machines: Two supplied by Andritz (width 5.6m, maximum design speed: 2,000m/min); one by A Celli (width: 5.6m, maximum design speed: 2,000m/min); one by Voith (width: 5.6m, maximum design speed: 2,400m/min)

Converting lines: 161 processing lines (143 are in production, 18 are being set up). Suppliers: Perini, Senning

Staff: 13,000 nationwide

Products: roll toilet paper, box facial, interfold facial tissue, interfold toilet paper, pocket facial, handkerchief, jumbo roll toilet, hand towel and wet tissue



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Aleksandar Tomovic
Sales Director (Americas), 9. Septembar

“ We consider Latin America a fairly dynamic market with good growth trends and potential. Seeing that Brazil is a leader in the Latin American region, with a large population and good economic growth, we see it as very logical to be part of the trade shows catering to our industry in Brazil. ”

Jerry Kasper, Sales and Marketing Director, Bretting

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Talking Tissue in Tokyo

I live and work in central Tokyo. I have studied and worked in Singapore, London and Moscow, so I consider myself to be an international urbanite. Living space is limited in a big city like Tokyo, so it is essential that everything in my apartment serves a precise function, or else there is no room for it. I think that cleanliness and functionality is very important in Japan, and this is reflected in the range and variety of tissue products available here.

Let me take you on a walk through my apartment. On the vanity unit of my bathroom I always have a box of paper hand towels. These are probably half the size of hand towels in Europe or the US. I keep them in a transparent dispenser that I bought from Muji



Nana's bathroom vanity unit has a transparent dispenser from Muji that houses a box of paper hand towels

in Ginza. It looks nice. I buy refills from Muji, but if they are out of stock of the size I need I sometimes buy full-sized towels at the supermarket or drugstore and cut them in half to fit into the box.

For toilet tissue I like to buy scented two-ply rolls. They are printed with a pink floral pattern, so they have a gentle and cheerful appearance. The subtle fragrance they give off is pleasant and means that the room always smells fresh and clean, even though it does not have an outside window. Usually I buy the same brand but I like to experiment every now and then if I see something new or pretty in the shop.

Moving into my living room, I always have a box of facial tissues on my coffee table - I think this is something that is almost universal

A variety of tissue products on sale at a local supermarket



Nana and one of her favourite tissue products, a scented two-ply toilet tissue



in Japan! I really like the cashmere lotion tissues. They are really soft and delicate - but this means they are not very strong and so I tend to get through them quite quickly. I take them out of the box and put them into a dispenser that I also bought at Muji. I keep this on a tray, so that they blend with the decoration of my room.

In my kitchen I always have a roll of kitchen paper handy, but somehow I don't use it so much. I tend to use a cotton dishcloth for wiping up spills, but I will use kitchen paper when I am cooking tempura or other dishes that need to stand before serving.

Finally, in my pocket or handbag I always have a small pack of pocket tissues. Usually I don't need to buy these as it is common for them to be handed out on the street or to receive them in banks and shops as advertising give-aways.

A tissue product from Muji



PIX Pulp indices 29.7.2014

NBSK pulp Europe

June market pulp statistics from the North American-based market intelligence provider Pulp and Paper Products Council (PPPC) came out quite strong. This was partly due to some of delayed shipments from May adding to the June total. Total shipments were up by 7.7% (or almost 300,000 tonnes) against June 2013 and the cumulative numbers over the first half showed now a minor 0.5% gain over 2013 after staying behind last year's volumes over the first five months.

In BSKP, shipments were up much less, by only 0.5% for the month and still down by 0.3% cumulatively. Strong total shipments helped producer stocks down, too, by two days for the total, seasonally adjusted. BSKP stocks were flat (although down by one day without the adjustment). Shipments to WE were up for the month of June, against June 2013, by 0.9% but still down by 1.1% over the first six months. With production losses continuing, the softwood pulp market remains firm.

FOEX's PIX NBSK index moved slightly up again, this time by 28 US cents, or by 0.03%, and closed at 927.84 USD/tonne. When converting this dollar-value into the weakening euro, the benchmark headed north by 4.55 euro, or by 0.66%, and the PIX NBSK index in euro ended at 690.36 EUR/tonne.

BHK pulp Europe

In hardwood pulp, the late delivery of May volumes within June boosted the numbers as did the near-record shipments to the Chinese market. Market BHKP shipments from the PPPC-member countries were up in June by almost 16%.

This pulled the cumulative shipments also to black numbers with a 1.5% gain over the first half 2013. Shipments were less strong to Europe, however, with June tonnage down by 1.2% and the cumulative number up now by just 0.2%. The strong shipments to China and other Asian countries brought the BHKP producer inventories down by six days from end May without seasonal adjustment and by five days with the adjustment. Still, those stocks are slightly higher than a year ago. The introduction of new tonnage has increased the spot offers and has indirectly also affected the contract prices which we follow.

The Euro weakened by 0.6% against the dollar from the previous week. Helped by the USD-strengthening, the PIX BHKP index value in Euro came down by only 21 cents, or by 0.04%, and landed at 542.12 EUR/tonne. With the dollar-strengthening probably impacting the sales price, the PIX BHKP index value in dollars came down quite substantially, i.e. by 4.89 dollars, or by 0.67%, and closed at 728.61 USD/tonne.

Lars Halén

Senior manager,
FOEX Indexes

Timo Teräs

Managing director,
FOEX Indexes

Paper industry

Increasing data over June confirms the continuation of the recent trends. Graphic paper decline has continued and packaging side shows moderate gains over the corresponding month/period in 2013. As an example, total demand for North American newsprint was down by 7.7% for the month of June and by 6.6% over the first six months.

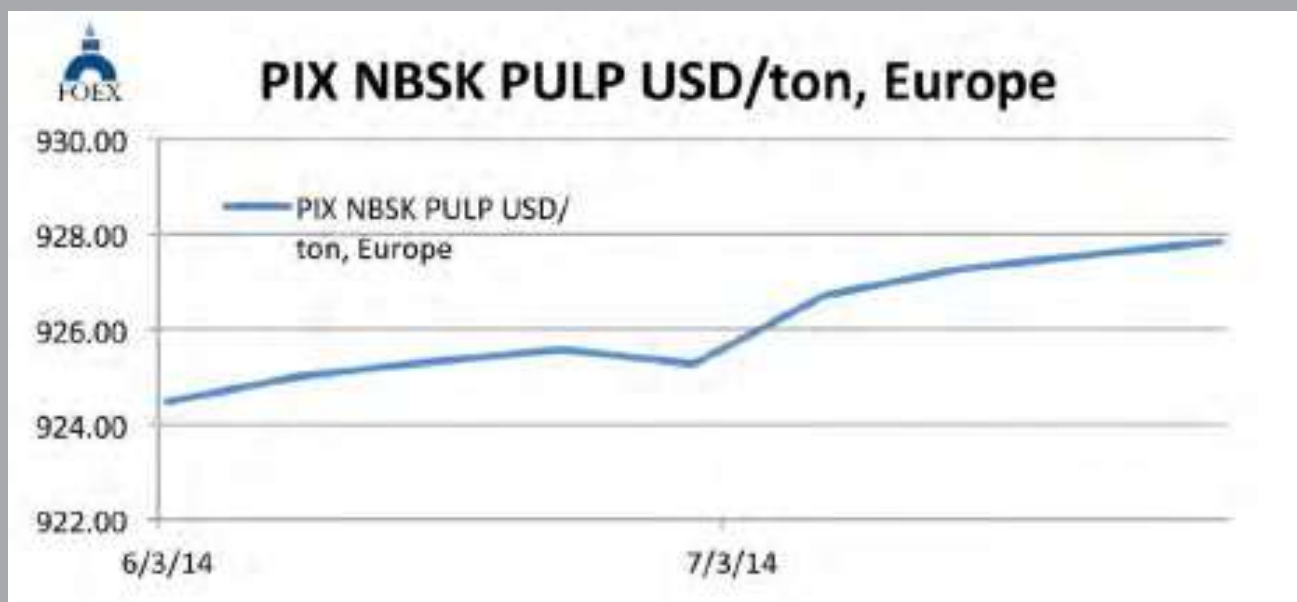
In the US, uncoated free sheet (the largest of the graphic paper grades) total shipments were down by as much as 7.9% for the month of June and by 8.0% over the first six months of the year. Total US printing and writing paper shipments (excluding newsprint) were down by 5% in June. But on the packaging side, US containerboard production was up in June by 0.7%, y-o-y and by 0.6% over the first half of the year and the U.S. boxboard production increased in June by 1.2%. Prices have started to move up, though, also in coated and uncoated free sheet grades.

In Europe, packaging sector numbers are not at our disposal over June. The preliminary printing and writing paper numbers from PPPC show a 3.3% decline for graphic paper total shipments in June and a 4.1% drop over the first six months. This is split between a 2.1% decline, y-o-y, in printing and writing and a 7.6% retreat in newsprint. The cumulative numbers are -2.3% and -10.8%, respectively.

In Europe, price increase attempts have not succeeded in recent months but in packaging, new initiatives have been announced from either August 1 or September 1. The recent modest weakening of the Euro raises costs from imported raw materials and improves the odds for paper and board price increases.

"With production losses continuing, the softwood pulp market remains firm."

Source: FOEX Indexes Ltd



FOEX Indexes produces audited and trade-mark registered PIX price indices for certain pulp, paper packaging board, tissue, recovered paper and wood based bioenergy/biomass grades. The PIX price indices serve the market in a number of ways. They function as independent market reference prices, showing the price trend of the products in question. FOEX sells the right to banks and financial institutions to use the PIX indices for commercial purposes, while RISI Inc. has the exclusive re-selling rights for subscriptions to the PIX data and market information. Please enquire for subscriptions at foexsubs@risi.com or via the following link www.foex.fi/subscribe/.

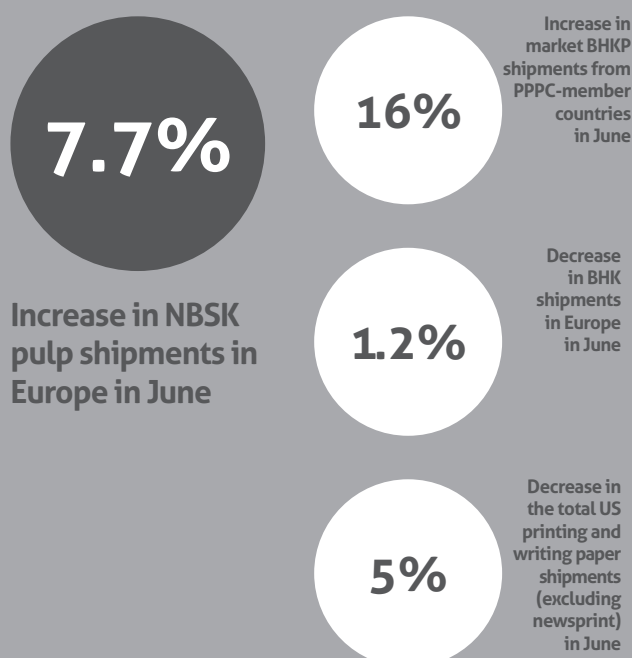
Tissue papers are produced either from virgin fibre, recovered fibre and various mixes of both, depending on the end product. High quality hygiene tissue products like medical tissue products, facial tissues, table napkins or other such household and sanitary products are often made exclusively or almost exclusively from virgin fibre pulp, whereas the share of recovered fibre typically increases in tissue products for a variety of end uses outside personal hygiene, such as kitchen towels or towels for garages or other such industrial production facilities etc.

Providing PIX pulp price indices gives the paper producer and buyer insight in the price trends with a weekly frequency. PIX indices are used as market reference prices e.g:

- by banks or exchanges that offer price risk management services for pulp buyers and sellers
- by buyers and sellers of pulp or paper in their normal supply contracts
- companies who want to employ an independent market reference price for internal pricing (e.g. pulp mill – paper/paperboard mill, paperboard mill – box plant) through licensing the commercial use from FOEX.

In addition, our price indices are widely used in financial analysis, market research and other such needs by all kinds of parties linked directly or indirectly to forest product or wood-based bio-energy industries. This way the companies have better tools to budget their cost or income structure and profitability, and may concentrate on their core businesses with less time spent on price negotiations, which tend to increase in these days as the planning span narrows in the wake of the short, quarterly business cycles and, nowadays, in most cases, monthly raw material pricing decisions.

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Private Label vs Brands: latest trends and developments

Worldwide, the private label and brands markets are rapidly evolving. In our Special Feature, TWM spoke to Mintel and Nielsen to get the latest on the respective markets in Europe and America. A TW report.

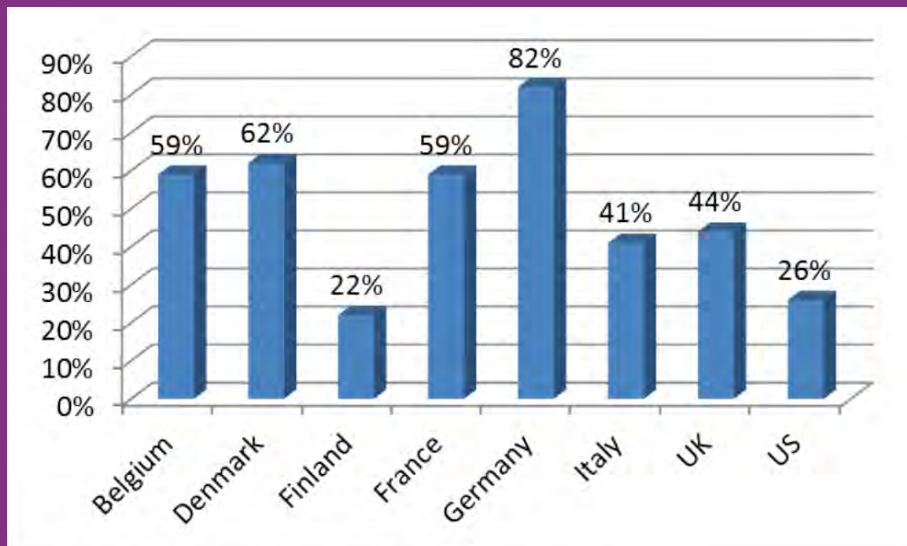
The timing of consumer trends, economic conditions and manufacturing technology has created very different evolutionary paths for name brand and private label household paper products in the US and Europe. The concept of discount retailers selling their own brands became prominent in Europe during recessionary conditions, and this tipped the industry power structure toward retailers like Aldi at an earlier date.

Will US private label reach European proportions?

This is an idea that industry executives have pondered for decades and, given private label's growing share in the US, this may be an appropriate time to revisit the question. Name brands like Kleenex and Charmin have become synonymous with their categories; they've built strong brand equity and



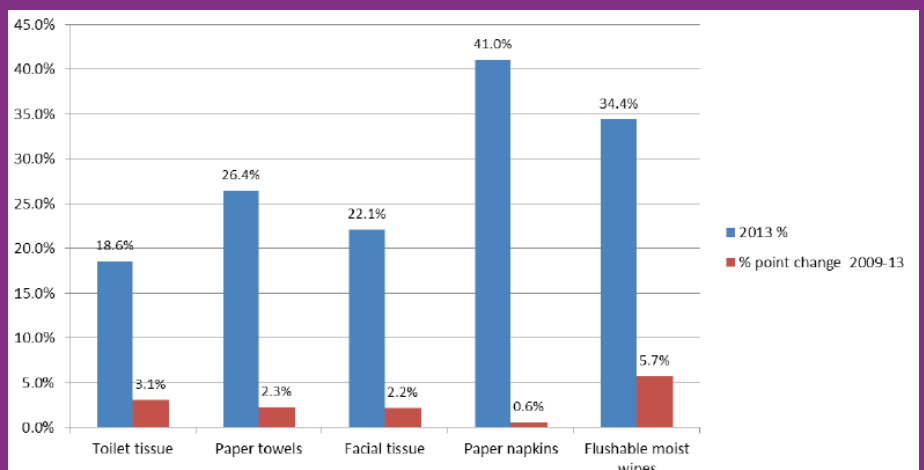
Private label % share of retail value sales of household paper, by country, 2013



Source: PLMA/ the Nielsen Company/ Mintel

Specific to the paper industry, technologies like through-air-dried (TAD) for softer tissue came to Europe later than in the US, at a time when patents had expired and barriers to premium manufacturing were lower for private label. This helped level the playing field and reduced the quality gap between brands and private label more quickly than in the US.

US, private label retail value share by category, 2013



Source: Mintel/Information Resources, Inc., InfoScan Reviews

'Kleenex has even expanded its domain to return to its roots as a makeup removal product.'

consumer trust. In the tissue category, brands are using innovative additives to sooth illness, and using design to enhance home décor. Kleenex has even expanded its domain to return to its roots as a makeup removal product.

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By Mintel's Jamie Rosenberg

Consumers have traded down

Yet many consumers who traded down to private label during the recent recession never moved back to name brands. Sales data show that private label has slowly gained share and, while not as fast as in Europe decades ago, there is now a confluence of consumer, manufacturing and economic trends that could keep US private label on a slow but steady growth trajectory.

Private label is innovating to keep

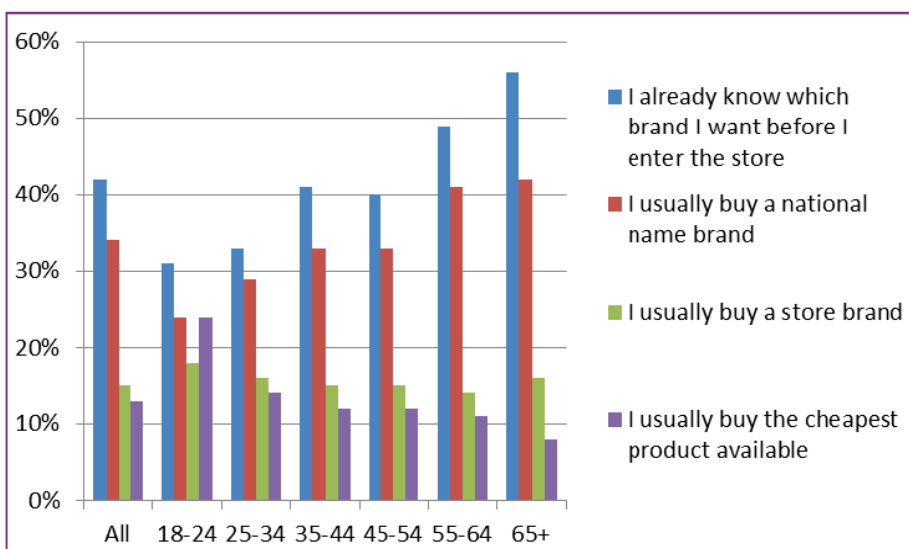
'Many consumers who traded down to private label during the recent recession never moved back to name brands.'

for their Boomer parents. However, as quality improves across the board, so do consumer expectations. Mintel data show that younger consumers view thicker

Conclusion

US household paper name brands are highly-recognised and trusted. However, US consumers have developed an economising mindset and this frugality is especially evident in the behavior of younger consumers. Bearing this in mind, the category is at a crossroad. Because of the high-volume and low-margin nature of household paper products, volatile input costs and private label improvements, brands will be challenged to maintain an innovation advantage, especially in the event of another economic downturn. Yet there are innovation scenarios where continued improvements may be seen as value-added, even among the most frugal.

'These young consumers are coming of age during an era of unprecedented private label quality relative to brands.'



Base: 1,809 consumers aged 18+ who purchase toilet paper
Source: Mintel

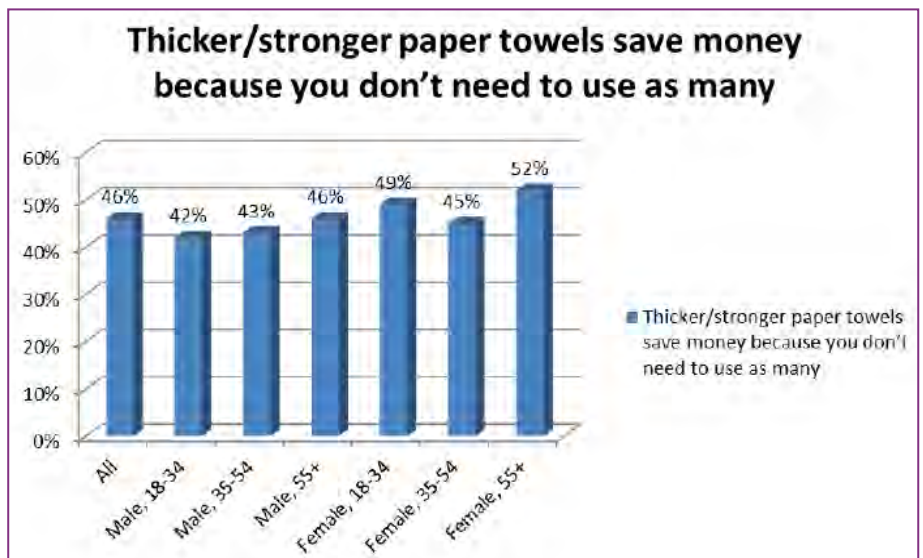
consumers from returning to brands. Manufacturers are installing premium-quality machines, and some, such as Walgreens Ology, have launched alternative fiber products, using bamboo and sugarcane husk.

Millennials are less brand loyal

Mintel research shows that Millennials are less likely to prioritise name brand paper products. They're less likely to have a brand in mind when they shop, and are significantly more likely to say they buy whatever is cheapest.

Shopping habits evolve as we age, and survey responses may have less to do with the fact that Millennials are steadfast private label shoppers, than the notion that they are usually less affluent. But these young consumers are also coming of age during an era of unprecedented private label quality relative to brands. This could create lifelong shopping patterns where brand loyalty never solidifies as it did

paper towels as value added, for instance, which suggests innovation scenarios to shepherd even the most cost-conscious consumers towards more premium products.



Base: 1,809 internet users aged 18+ who use paper towels
Source: Mintel

Timing is everything in private label evolution

The private label sector in the US experienced a sizeable growth spike during the recent recession and that upward trend continued through 2010 and 2011. However, as global economic conditions improved in the years that followed, share growth among store brands flattened. Following are some tips on how private label and brands can both succeed in a crowded marketplace.

How does the private label sector look today?

Beyond 2008 and 2009, the private label sector did well. In 2010 and 2011, there was growth in terms of both dollar sales and unit sales. But since then, the private brands share has been fairly flat. Brands have simply out promoted them. They've done a better job of innovating and connecting with shoppers that mattered. Most retailers do not do a very

rigorous job in terms of analytics around private brands as brands do. This is part of the reason brands are so much bigger in terms of the marketplace than private brands are. It's important for retailers to consider what kind of a product they want to match the shopper demand that they have.

What is the private label landscape for tissue products?

US private label gains in paper products outpace those for the total market. Private label share of paper products increased from 26 share of dollar sales in 2010 to 29.6 in the latest 52 week period ending July 5, 2014. This represents a 3.6 gain in share, while private label dollar share across the store only increased by 1 share point. Gains were made in all segments within paper products.



'US private label gains in paper products outpaced those for the total market.'

'They've done a better job of innovating and connecting with shoppers that mattered.'

PL % OF SEGMENT				
52 WEEKS ENDING 07/10/10	52 WEEKS ENDING 07/09/11	52 WEEKS ENDING 07/07/12	52 WEEKS ENDING 07/06/13	52 WEEKS ENDING 07/05/14

TOTAL PAPER PRODUCTS	26.0	26.5	27.5	28.7	29.6
DISPOSABLE PLATES/CUPS	44.2	46.6	47.9	49.4	50.6
FACIAL TISSUE	20.7	20.5	21.6	22.1	23.3
PAPER NAPKINS	41.6	42.7	43.2	42.8	43.8
PAPER TOWELS	26.7	26.9	27.5	27.6	27.8
REMAINING PAPER PRODUCTS	34.6	34.7	35.7	36.4	37.7
TOILET TISSUE	15.6	15.9	16.9	19.1	19.8

GRAND TOTALS – PL share across all Nielsen-measured categories

16.5	17.0	17.3	17.4	17.5
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Special Feature

By Nielsen SVP's Todd Hale

How are some retailers setting the pace in private label?

Early this year, Nielsen researched best of breed retailers and recognised the top 10 that had the highest private brands share throughout the store. Two of these retailers were non grocers. The other eight were grocers. No one magic bullet was driving their success. There were differences among all the retailers in terms of how they promote the items they carry and how they apply analytics to them. There were differences in terms of the kinds of shoppers they attract and even with whether or not they have their store name included in their private label product names. There were also differences regarding whether these retailers offer 40 or 50 private brands in their store or a single one. Ultimately, best of breed retailers win through a combination of organisational focus from top down and through operational excellence. Retailers win by ensuring that they are getting the right product at the right price in order to be able to deliver the right margin across the store in their given categories. Ultimately, they must understand their shoppers' demand for products and categories in private brand versus brand.

Conversely, what can brands do to compete with private label?

First, brands must recognise that private brands are a mainstay. Retailers are making themselves and their bottom line stronger through their connection with shoppers. So, rather than treating private brands as the enemy, increasingly, manufacturers must have a collaborative mindset and win with both private brands and brands across the total store. Manufacturers would do well to consider joint promotion opportunities. If a brand appeals to a different set of consumers than a private brand does in a category, then, perhaps both should be promoted in the same week. Create integrated shelf sets. Consider how to help retailers lay out the store shelf and finally, find some white space and categories where private label doesn't have a presence. Talk to the retailer about placement in some other categories where they don't already have a private label presence.



By Kemira Chemicals' Clay Campbell, Chen Lu, Junhua Chen, Harold Goldsberry, Adrian Stuart

Utilising novel temporary wet strength for the AfH towel market. A TW report

Polyamidamine epiclorohydrin (PAE) resins are widely used to provide permanent wet strength (PWS) properties in the away from home (AfH) towel market. However, high PAE usage can cause operation problems, reducing machine's operational equipment efficiency (% OEE). In addition, towel producers and consumers occasionally complain about poor re-pulpability, toilet pluggage/dispersability and issues related to environmental disposal.

In most AfH towel applications, having long term wet strength "permanence" is not necessary, as the end user requires only a short period of wet strength performance. The expanding use of "hands free" automated dispensing units' further supports this need for less permanence. Temporary wet strength is actually more desirable as it meets consumers' needs and can address the manufacturers' concerns with using PAE chemistries.

New novel temporary wet strength (TWS) utilising modified glyoxalated polyacrylamide (GPAM) technology offers AfH towel manufacturers a variety of benefits and most importantly significantly reduces the use of permanent wet strength (PAE) chemistries. As outlined in a Kemira patent, there is synergistic performance of direct contact addition of both GPAM and PAE chemistries.

This technical paper focuses on improving wet end strength performance efficiency, reviewing permanent vs. temporary wet strength requirements and process factors that can affect wet strength performance. The case studies illustrate how using TWS can provide significant beneficial impacts on both sheet quality and machine overall operating efficiency.

Polyamidoamine epiclorohydrin (PAE) resins are widely used to provide permanent wet tensile strength sheet properties in the AfH towel market. In most AfH towel applications, having long term wet strength "permanence" is not necessary as the end user requires only a short period of wet strength performance. Test results from a February 2009 laboratory study completed by K. Redway, Department of Biomedical Sciences at the University of Westminster, London, showed that paper towels efficiently dry the hands of users achieving 90% dryness in approximately 10 seconds.

Use of medium to high dosages of permanent wet strength (PAE) usage can cause operation problems, reducing the machine's operational efficiency. This paper reviews the concept of incorporating novel temporary wet strength (TWS) technology and how mills are improving net profit by more than \$1.0M/yr.

Permanent wet strength (PWS-PAE) technology is very effective in providing wet tensile sheet strength properties, however, there can be quite a few areas within the tissue making process in which PWS-PAE can cause both process and sheet quality issues.

An effective way to ensure PWS-PAE is not overused is to monitor the Wet Strength Performance Efficiency (WSPE) and obtain the

highest wet tensile property or the optimum wet over dry wet tensile ratio. The wet strength performance efficiency (WSPE) is measured as paper wet tensile strength Index over the wet strength resin dosage. An example would be if 10 kg/t of PAE provides a 10 N.m/g CD wet tensile index, then $WSPE = 1.0$ (kN.m/g). The key to optimum towel production is to maintain the highest strength performance efficiency.

Monitoring and tracking the WSPE within a given grade over time and comparisons from grade to grade provide useful insight to understand what fibre, water chemistry and process parameters impact WSPE. In an example of comparing two high basis weight towel grades (brown versus white) on a wet crepe machine using recycle fibre, a brown towel will have a higher WSPE. This is a result of the higher ash content in the mixed office waste (MOW) furnish in white towel, rendering the PWS-PAE less effective.

Temporary wet strength (TWS) additives are comprised of novel cationic glyoxalated polyacrylamide (GPAM) technology well suited to provide multiple benefits for the AfH towel market and allow PWS-PAE to be significantly reduced or no longer required. TWS-GPAM technology process and product benefits include:

- Increases both wet and dry tensile strength
- Utilisation of lower cost furnish (fibre substitution)
- Reduced re-pulping time
- Reduced basis weight
- Optimised refiner(s) use
- Improved paper machine speed/productivity
- Reduced linting and dusting
- Improved converting efficiency

TWS-GPAM technologies are vastly improved over conventional GPAM technology allowing for both a wider range of cationic charge properties and significantly longer shelf life. As demonstrated in the table below, conventional GPAM will significantly increase viscosity in a matter of weeks to the point of gelation, while the Fennobond novel GPAM will experience nominal viscosity increase after 90 days.

Whether using PWS-PAE and/or TWS-GPAM, it is important to understand and if possible control the process water chemistry to maximise WSPE. The ideal process condition for TWS-GPAM applications is an operating pH of 4.5-7.5, less than; 400ppm hardness (ppm CaCO₃), 5ppm sulfite, 150ppm alkalinity and 2,500ppm conductivity (µS/cm).



Clay Campbell



Senior manager,
global business development,
Kemira

By Kemira Chemicals' **Clay Campbell, Chen Lu, Junhua Chen, Harold Goldsberry, Adrian Stuart**

Experimental

Laboratory handsheet study using primarily old corrugated container (OCC) furnish in manufacturing brown towel was carried out to compare three conditions; PWS-PAE alone, PWS-PAE with carboxymethylcellulose (CMC) at a typical addition ratio of 4:1 and reduced PWS-PAE usage (66% reduction) with TWS-GPAM at a 1:3 ratio.

Results demonstrate that using primarily TWS-GPAM with small additions of PWS-PAE resulted in greatest wet and dry tensile. In addition, even though initial wet tensile was significantly increased, the 30 minute soak remained constant. PWS-PAE typically experiences wet strength decay of 25 % or less, while TWS-GPAM technology can be controlled to achieve wet strength decays of more than 60%.

The ability for TWS-GPAM to provide faster and greater decay rates than PWS-PAE make it well suited for use in the AfH towel market. A benefit of using TWS in the final towel product is that it can provide the required wet tensile performance while providing faster break down if inadvertently disposed of in a toilet or public sewer treatment and intentional disposal at landfill sites. However, re-utilisation of the wet strength containing broke is one of the towel manufacturers greatest concerns as PWS-PAE is not easily broken in the repulper. PWS containing broke can cause extended re-pulping times (production limitations), need for re-pulping aids (i.e. caustic, hypochlorite, etc) to minimise/eliminate carry through of fibre bundles to the towel machine head box. Fibre bundles will impact both sheet quality and process operating efficiency. Utilisation of TWS-GPAM has the ability to improve wet tensile decay thus reduce re-pulping time by as much as 33-50%.

CASE STUDYS:

Case Study #1: Using TWS on recycled AfH unbleached towel

A tissue mill produces 1 ply, 21# basis wt, unbleached towel grades with 100% OCC on a wet crepe machine. Typical wet end functional chemicals used are PWS-PAE at 7.0lb/tonne (3.2kg/t) and dry strength – CMC at 2.2lbs/tonne (1.0kg/t). The wet and dry strength ratio is typical within the 3.0-4.0: 1 ratio. It was the manufacturer's desire to increase the WSPE, thus reducing excessive foam, chemical cost, felt deposits and improve machine runnability/productivity.

Fennobond TWS-GPAM was added to the thick stock dosage point at 1.6 lb./tonne dry (0.7kg/t). As the wet tensile test increased, PWS-PAE was reduced by 70% to 2.1 lb/tonne dry (0.95kg/t) and the CMC dosage was removed. Over a period of 30 days, the PWS-PAE was completely phased out, using the Fennobond TWS-GPAM at 3.6 lb/tonne dry (1.6kg/t) to provide both the wet and dry tensile requirements. An improvement of more than \$800K (600€/yr) net profit was obtained via an increase in grade productivity, 8% lower dryer energy cost (improved drainage) and savings in fibre and chemical costs.

Case Study #2 Using TWS on virgin fibre AfH white towel

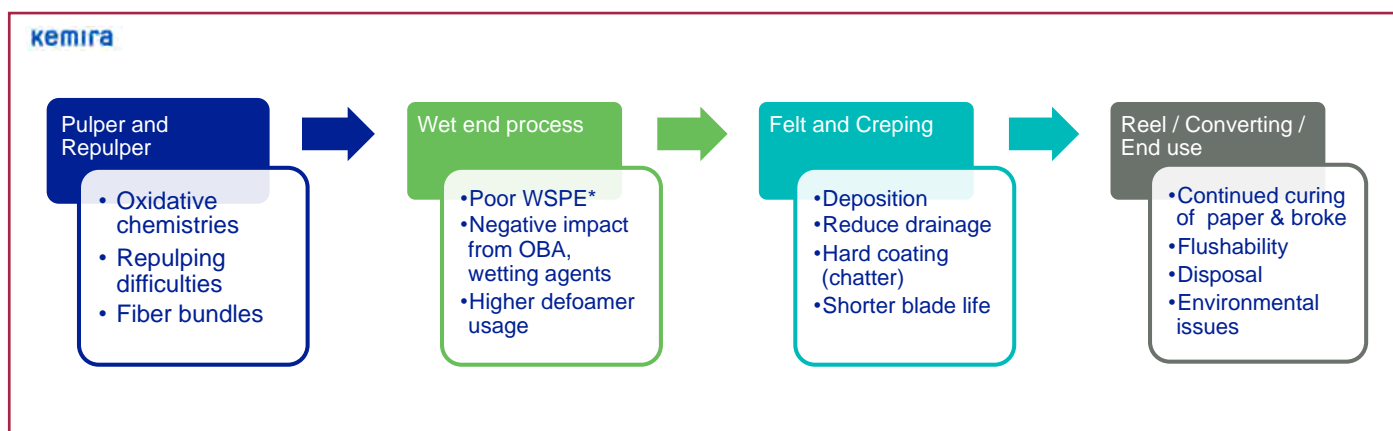
A tissue mill produces 2 ply, bleached towel grades using 75% hardwood and 25% softwood furnish for a dry crepe machine. PWS-PAE at 4.0lb/tonne (1.8 kg/t) and an anionic polyacrylamide (APAM) charge control agent at 2.0lbs/tonne (0.9kg/t) were used to keep the head box charge on the anionic side. The manufacturer was frequently adjusting the APAM dosages based on the wet strength impact on the furnish charge. If the head box charge drifted to the cationic side, higher wet strength and defoamer usage would occur with increase felt filling, lower WSPE and slower Yankee dryer speeds.

Fennobond TWS-GPAM was added to the thick stock at 2.3lbs/tonne (1.0kg/t) allowing for complete removal of the PWS-PAE and charge control-APAM. A single component addition allowed for ease of application while consistently maintaining an anionic head box charge. The Fennobond TWS-GPAM provided wet and dry tensile flexibility for tensile management similar to the previous. The manufacturer saved \$1,000/day (700€/day) as result of increased felt performance, lower chemical spend and fibre substitution mix.

Case Study #3 Using TWS on blended recycle/virgin furnish white towel

A modified TAD tissue machine producing 15lb. towel uses 70% mixed office waste (MOW) and 30% virgin fibre mix. PWS-PAE at 17.0lbs/tonne (7.7 kg/t) and dry strength-APAM at 4.0 lbs/tonne (1.8kg/t) at a fairly constant 4.25:1 ratio for wet and dry strength control. The manufacturer was interested in developing a more robust strength programme that enabled the machine speed increase while increasing the MOW utilisation ratio. Fennobond TWS-GPAM was added to the thick stock at 10.0lbs/tonne (4.5kg/t) allowing the PWS-PAE dosage to be reduced by 44%

Figure 1, Utilising TWS for the away from home (AFH) towel market, Clay Campbell



By Kemira Chemicals' Clay Campbell, Chen Lu, Junhua Chen, Harold Goldsberry, Adrian Stuart

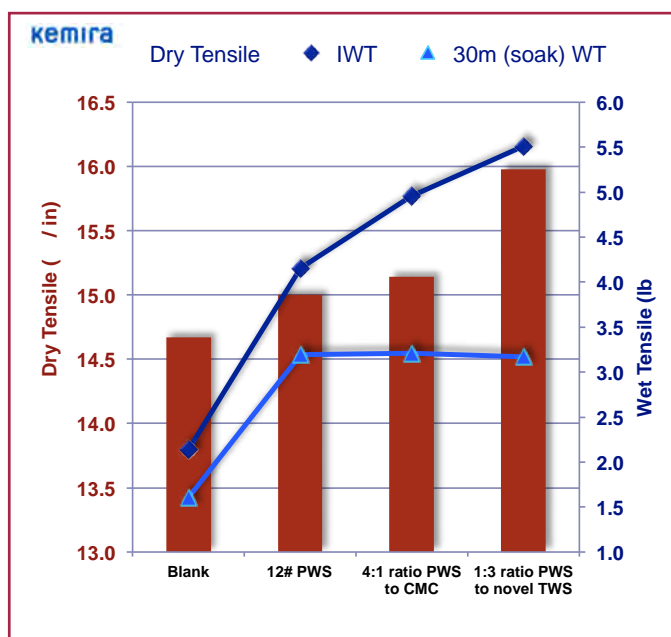
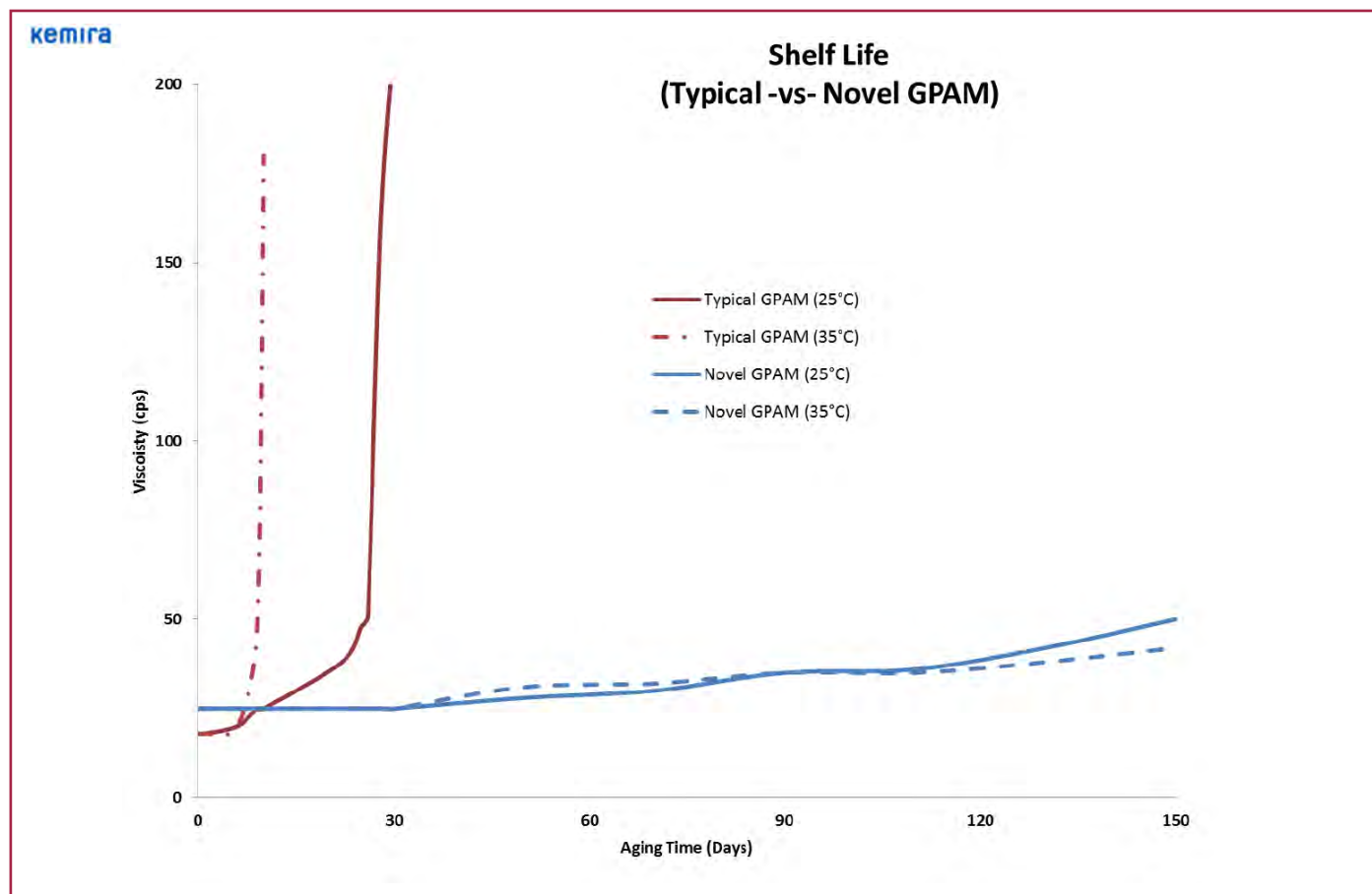


Figure 2, Utilising TWS for the away from home (AFH) towel market, Clay Campbell

at 9.5 lbs/tonne (4.3 kg/t) and APAM reduced by 50% to 2.0lbs/tonne (0.9 kg/t). This new wet end functional chemical package allowed the manufacturer to increase the MOW furnish from 70-90%, improve machine speed and system charge balance for excellent runnability. Profit improvement was greater than \$1.5M (1.0M€)/yr.

Figure 3, Utilising TWS for the away from home (AFH) towel market, Clay Campbell



Conclusions

Permanent wet strength resins have been used for decades in manufacturing away from home towel grades as a result of no competitive technology. Fennobond temporary wet strength technology can reduce and potentially eliminate permanent wet strength PAE chemistry, offering the AfH towel manufacturers a significant alternative option in managing the wet end process and strength sheet properties. There are several key areas in which the manufacturer can realise benefits from providing a more robust and responsive wet end strength program. There are not only significantly less repulpability, process and product quality issues, but also improvements in machine speeds, chemical cost savings and fibre substitution (lower cost). The utilisation of TWS allows the manufacturer the opportunity to differentiate the final end towel product for market promotion of a more effective end user and environmentally friendly towel.

The following actions are recommended when exploring temporary wet strength approach for AfH towel:

- Monitor and control WPSE to maintain the highest wet strength performance efficiency
- Initiate a wet end process survey that incorporates water chemistry and process charge testing, functional chemical applications points and grade specific sheet quality specs
- Lab hand sheet strength screen testing and retention / drainage testing provides the most accurate means of developing the optimum wet end strength management programme

Taking a closer look at innovation and sustainability

In every region of the world, the tissue market is experiencing exciting expansion. Consequently, although the specific challenges and opportunities vary depending on the region, many shared challenges exist, including the consumer demand for improved quality at a reasonable price, the need to control manufacturing costs and asset efficiency and the desire to protect the environment by operating in a sustainable manner.

Solenis, formerly known as Ashland Water Technologies, was formed through various mergers of several organisations including Hercules, Houghton, Dearborn, Quaker and Betz PaperChem. Over the past 10 years, Solenis has worked to develop a strong R&D process focused on innovation. This has resulted in the development of several unique capabilities, including process simulation, predictive tools and models. Recently, Solenis introduced several innovations that were developed specifically to address these shared challenges in the tissue and towel market.

Enzymatic Dry Strength

Dry strength is a critical functional quality parameter of tissue products. Previously, the use of a product to enhance strength has often resulted in a negative effect on softness or even increased costs. More recently, enzyme-based products were introduced and have shown some promise as well as some limitations, including product stability, cost-in-use and control of reaction. Solenis has worked to address the shortcomings that existed in the market, resulting in the development of several new Hercobond™ enzyme-based products.

Cellulase activity and storage stability

Not all cellulase enzymes are created equal. Tests have been conducted to identify the best cellulase available to maximise performance and to develop new enzyme preparations that demonstrate product stability and synergistic effects on tissue dry strength properties. Table 1 represents the relative enzyme activity levels of the Hercobond product A versus the base enzyme, Product B. Once improved efficiency and stability were achieved by adjusting the product formulation and differentiating performance was demonstrated, the technology was validated in several different operations.

Cellulase Products	Cellulase Activity (ECU/g)	Relative Cellulase Activity %
Product A	815	123
Product B	740	100

Mill trial - improved performance over base enzyme

A tissue machine used a liquid cationic starch on a Crescent former to produce bath tissue using 100% deinked pulp (DIP). The aim was to determine if Hercobond Product A was superior to base

enzyme Product B in a commercial trial. A two-day evaluation was conducted to compare the two cellulase products. The cellulase product dosages were 1.75 pounds per tonne dry recycled DIP based on the same cellulase active. The bath tissue product had a basis weight of 9.1 pounds per 3,000 square feet.

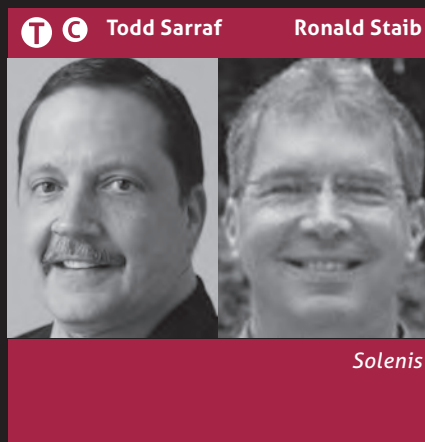
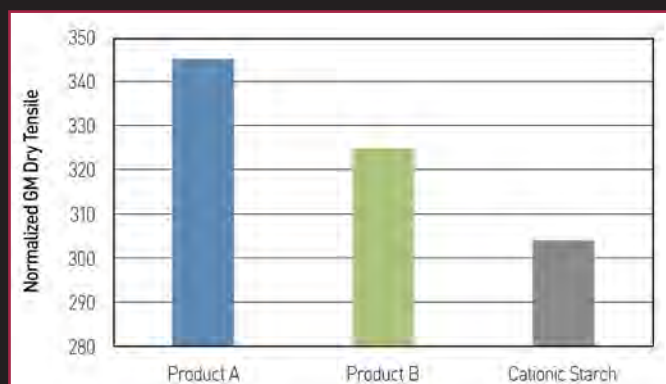
As shown in Figure 1, both Product B and Product A demonstrated better dry tensile strength performance than the liquid cationic starch. However, Hercobond Product A yielded a 14% improvement in dry tensile strength compared to the starch and Product B achieved only a 7% improvement over the starch. The new Hercobond products were proven to be extremely effective in developing strength while minimising the negative effect on quality and cost-in-use.

Fines management

Premium tissue and towel producers constantly strive to optimise their operations to produce strong, soft, absorbent products that exhibit minimal quality variations. To minimise finished product variations and to maximise productivity, tissue producers often centerline critical operating parameters, such as Yankee pressure, refining energy, sheet moisture at transfer points, etc. Fines are typically an overlooked variable in these systems that can dramatically effect finished product quality as well as machine efficiency. Recently, due to environmental pressures and waste costs, producers have been forced to limit sewer losses. As a result, fines management has become a more critical to improve sustainability efforts.

Several different strategies are currently used to manage fines. The most effective results are achieved by operational procedures and chemical approaches. See figure 2

Figure 1. Comparison of Hercobond Product A and Base Enzyme Product B in Tensile Strength Development.



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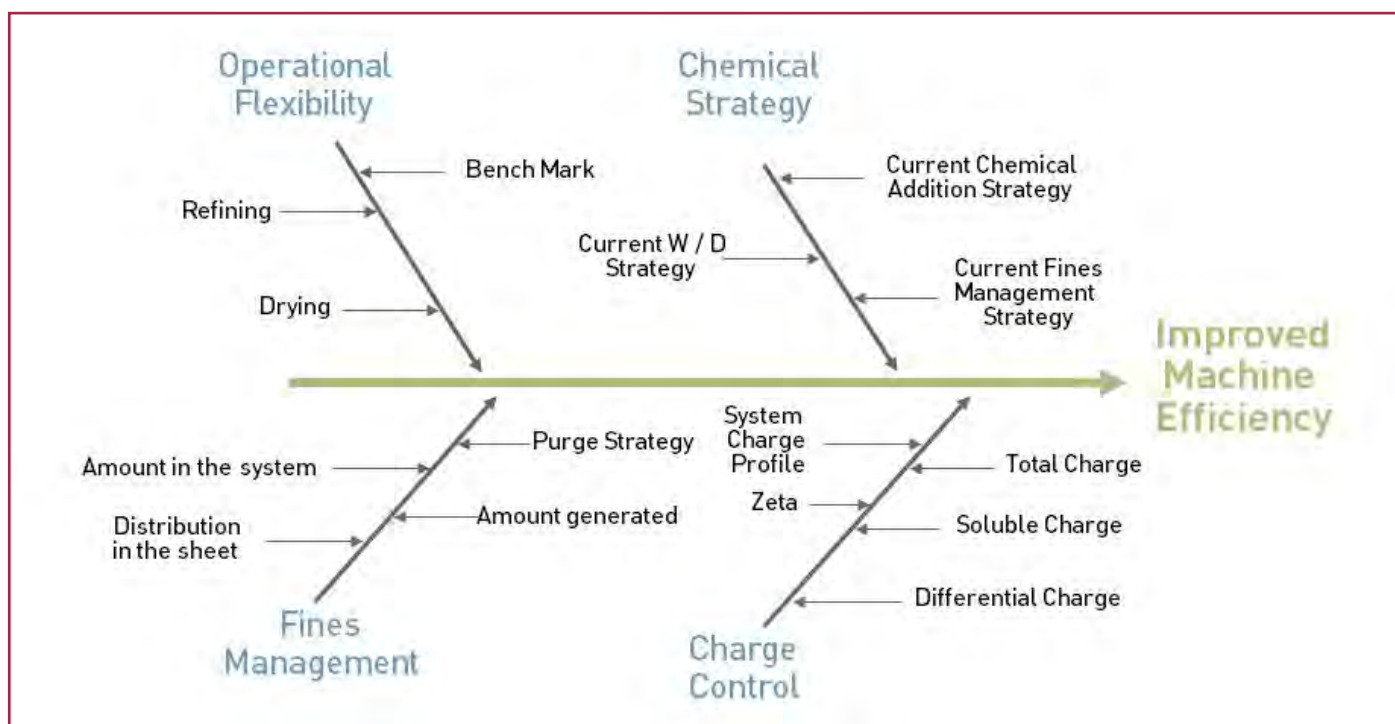


Figure 2. Cause and effect for charge and Fines management impact on machine efficiency.

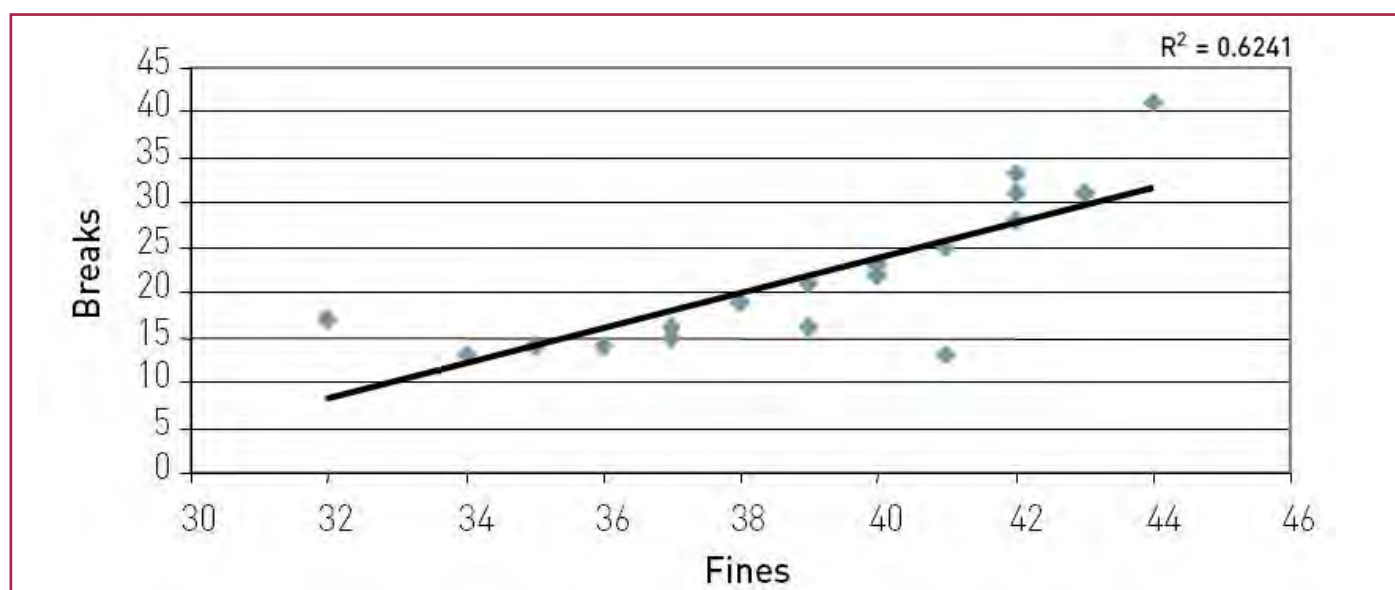
PerForm™ SP advanced retention and drainage aids - "an enabling" technology for the T&T market

Perform SP technology has been used effectively to manage fines and to improve chemical efficiency in systems using wet strength or another cationic co-factor to improve fines retention, wet strength and operational efficiency. The second-generation PerForm SP technology delivers a unique, structured, micro particulate that is effective in improving retention while having minimal to no impact on formation that a standard APAM has exhibited in the past.

	APAM	Gen 1	Gen 2
Intrinsic Viscosity, dl/g:	27.2	20.6	16.6
Shear Modulus, G, Pa:	130	280	> 300
Relative Drainage:	20	35	45

Figure 3. Comparison of structured polymers and conventional unstructured polymer.

Figure 4. PerForm SP Impact on headbox fines and blade changes polymer.



By Solenis' Todd Sarraf and Ronald Staib

Figure 3 illustrates the sequential process modifications used to produce Generation 1 (G1) and Generation 2 (G2) products compared to a conventional, unstructured anionic polyacrylamide (APAM) retention aid, thereby highlighting the change in polymer structure and performance. The G2 product is a smaller, more congested particle as illustrated by the reduced intrinsic viscosity and increased shear modulus. These structural changes in the molecule correlated to improvements in on-machine performance.

Case history

A towel Crescent former running at speeds in excess of 6,000fpm and producing 250 tonnes per day running virgin fibre was looking for improvements in fines management to improve machine cleanliness, to reduce blade changes and to improve wet strength efficiency. Results included:

- Reduction in dry strength chemistry by 75%
- Reduction in clarifier polymer use
- Reduction of five pounds/tonne of wet strength (while increasing wet over dry)
- Ability to increase machine speed
- Reduction on blade changes

Wet strength

Polyaminopolyamide-epichlorohydrin (PAE) resins were developed more than 50 years ago and have become the predominant chemistry used in the paper industry to manufacture wet-strengthened paper. Over the last two decades, PAE producers focused product improvement and development efforts on two main initiatives: improving PAE resin efficiency and achieving paper manufacturers' improved health and sustainability objectives. The latter has been driven primarily by regulatory initiatives focused on "cleaner" products with much lower levels of epichlorohydrin (epi) by-products and much lower levels of adsorbable organic halides (AOX).

Development of high efficiency PAE products

The reactivity in PAE resins arises from quaternary ammonium functionality (azetidinium) that provides "permanent" cationicity to the polymer, which enhances retention of the active polymer on pulp fibres. Additionally, the azetidinium functionality reacts with carboxyls on pulp fibres (co-crosslinking) and self-crosslinks (homo-crosslinking) to provide a wet strong structure. Highly efficient resins typically

maximise the azetidinium (AZE) level and the molecular weight (MW) of the resin while maintaining gelation stability. Recent research efforts by Solenis have led to a breakthrough in resin design such that a family of resins with 12.5-30% solids can be manufactured without compromising performance or gelation stability and is now available. These new, high efficiency, high solids PAE resins also have a relatively low level of 1,3-dichloropropanol (DCP) and 3-monochloropropanediol (MCPD) and therefore have a good environmental profile.

Regulatory, health and sustainability improvements

In PAE wet-strength resins, two types of organic chlorine species exist: (1) free epichlorohydrin by-products, 1,3-dichloropropan-2-ol (1,3-DCP), 3-monochloropropanediol (3-MCPD), and unreacted epichlorohydrin (typically at very low levels, thus will not be considered further); and (2) polymer bound organic chlorine (PBOX) species. PBOX include: (a) aminochlorohydrin (ACH), the principle species formed from the initial reaction between epichlorohydrin and the amine groups of the poly (adipic acid-co-diethylenetriamine) prepolymer; and (b) polymer bound CPD (PB-CPD), the species formed from the reaction between epichlorohydrin and the acid end groups of the prepolymer.

As PAE resins evolved, the product definitions of AOX measurement and epi by-products have become inconsistent across product "generations". Table 2 summarises the recommended definition for each product generation (G1, G2, G2.5 and G3).

Solenis was the first manufacturer of PAE resins to address customers' concerns about free epichlorohydrin by-products (1,3-DCP and 3-MCPD). These substances are considered to be carcinogenic. For products that contain more than 1000 ppm of 1,3-DCP (G 1 wet strength resins), the Safety Data Sheet usually contains a note identifying the presence of 1,3-DCP and explaining that it has been shown to cause cancer in laboratory animals and that it is listed as a possible human carcinogen by the International Agency for Research on Cancer. Customers concerned with worker safety should consider selecting G2 PAE resins. In Europe, 1,3-DCP is considered to be a Substance of Very High Concern under REACH. Consequently, no wet strength resins that contain more than 1,000ppm of 1,3-DCP are manufactured or imported into the European Union. The free epichlorohydrin by-products (1,3-DCP and 3-MCPD) are volatile organic compounds (VOC) and are potential contributors to mill VOC emissions. The total amount present in the PAE resin has to

Table 2. AE Wet-strength resin generation definitions.

Attribute	Generation 1	Generation 2	Generation 2.5	Generation 3
1,3-DCP Level (wet product basis)	> 1,000 ppm	< 1,000 ppm	< 1,000 ppm	< 10 ppm
PB-CPD Present in the Resin	Yes	Yes	No	No
% AOX Level (20% basis)	> 0.80 wt %	< 0.60 wt %	< 0.25 wt %	< 0.20 wt %
Customer Driver	Lowest cost	Carcinogen warning label	AOX, OX in paper, BfR	BfR, AOX, OX in paper



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By Solenis' Todd Sarraf and Ronald Staib

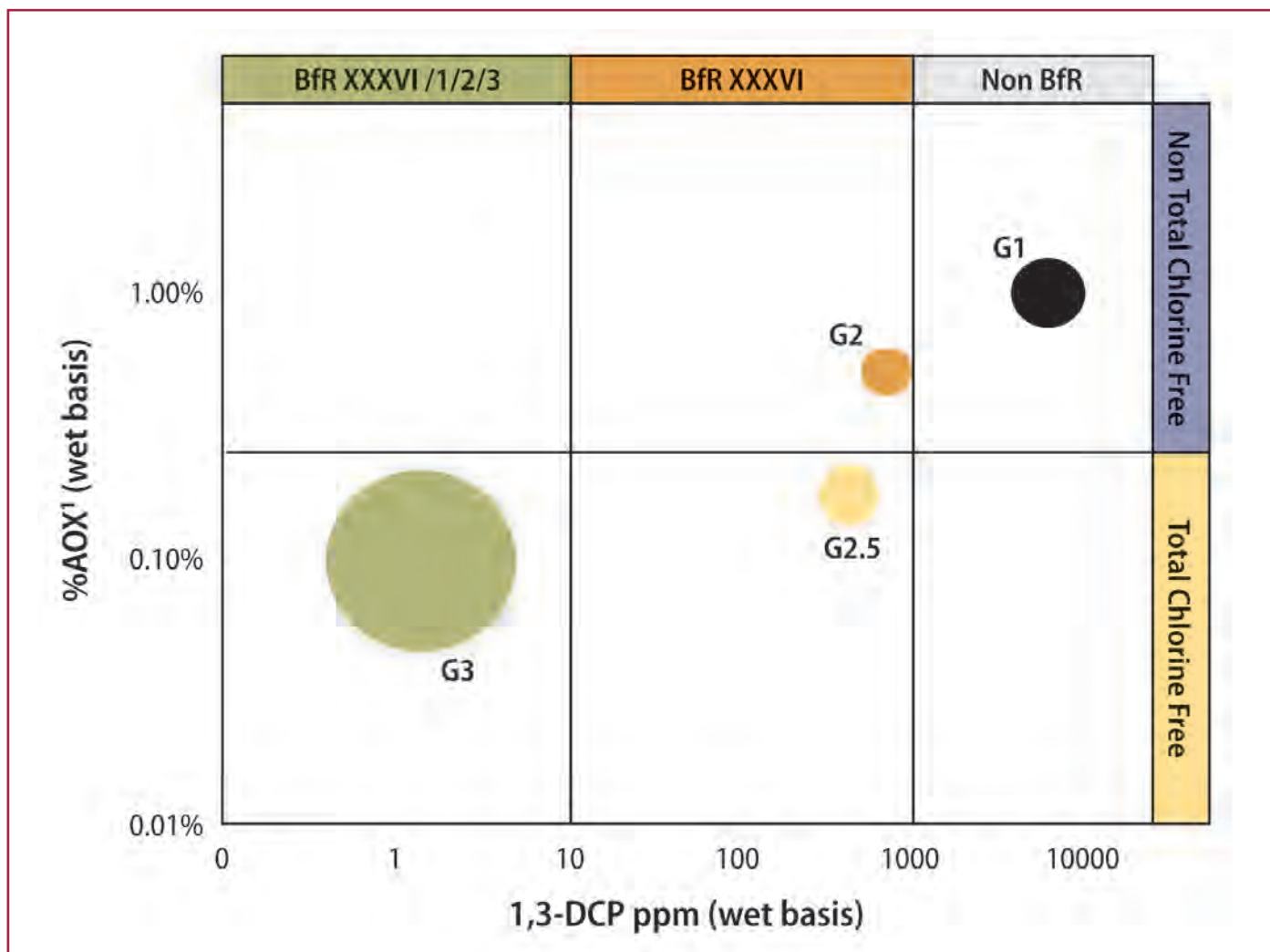


Figure 5. Paper compliance matrix for PAE resins.

be considered by mills and customers that have limitations on VOC levels in their local operating environment.

Another factor of regulatory concern is adsorbable organically-bound halogens (AOX) in the tissue product and in mill effluent. Allowable AOX levels are set by governmental regulations and non-governmental guidelines. Free epichlorohydrin by-products can be contributors to AOX. Even when using G2 PAE resins (with < 1000 ppm of 1,3-DCP on a wet product basis) AOX limits can be exceeded because polymer-bound species, ACH and PB-CPD, are by far the main contributors to AOX.

Solenis developed a patented process to manufacture PAE resins that do not contribute to AOX in the paper or in mill effluent. The manufacturing processes for these wet strength resins, developed to eliminate PB-CPD species from the final product also reduce the level of ACH, thereby reducing the total AOX and PBOX content of the resin. These resins are suitable for manufacturers wishing to meet AOX effluent requirements and to produce BfR-compliant and Total Chlorine Free (TCF) grades of paper.

Case history: generation 2.5 PAE resin contributes lower OX in high wet strength towels for mills using TCF furnish

A European tissue mill making high wet strength towel (twin wire former, 22,500tpa, 1,650m/min) used a G2 PAE resin for most applications and was meeting BfR XXXVI requirements for kitchen towels satisfactorily. However, on certain grades, where a key parameter was to have low OX in the finished paper for specific supermarket customers, the mill was unable to achieve the necessary specification.

Customer trials were run using Solenis' G2.5 resin. Efficiency was improved compared to the incumbent G2 resin. Results from independent laboratory (ISEGA) testing showed the OX levels in the kitchen towel made with the G2.5 resin were much lower than those obtained with the previous program and comfortably below the limits set by the BfR.

New creping adhesive development

Maintaining sheet control on the Yankee dryer is critical to

By Solenis' Todd Sarraf and Ronald Staib

producing high quality tissue. As Yankee dryer temperatures increase and sheet moisture decreases, sheet control becomes more difficult to maintain. By investigating the relationship between adhesive structure and film properties, Solenis has developed a new creping adhesive, marketed as Crepetrol™ 9200, that provides superior sheet control under these harsh conditions.

Using an experimental design to assess structure-activity relationships was critical to this research. A design platform consisting of two polymers (a polyaminoamide and a proprietary copolymer) covalently cross-linked with epichlorohydrin was selected for the new adhesive. The polyaminoamide was expected to provide adhesion between the Yankee surface and the sheet. The second polymer was expected to provide both good film-forming characteristics and moisture handling capabilities. The crosslinker (epichlorohydrin) imparts thermosetting character to the final product and builds molecular weight.

Experimental Design

The experimental design elements included:

- Ratio of polyamide to copolymer
- Dosage level of epichlorohydrin
- Amine content of the polyamide
- Type of diacid monomer in polyamide
- Type of diamine monomer in polyamide
- Molecular weight of polymer polyamide
- Amine level in copolymer
- Molecular weight of copolymer

Computer modelling of the entire matrix prior to synthesis suggested some products would not be water-soluble, therefore, they were not synthesised. The half-factorial design led to production of roughly 120 different samples for study.

Testing methodology to assess creping adhesive performance included using a proprietary Adhesion/Release Test (ART) developed by Solenis, as well as film persistence and film rewettability tests. The ART was used to test the ability of the experimental materials to function as creping adhesives. Dry ART testing mimics the adhesive's performance at the creping blade. The sheets to be tested were prepared on Solenis' pilot paper machine so that furnish and wet-end chemistry could be controlled.

All samples were compared to a control that was a standard thermosetting PAE (PolyaminoAmide-Epichlorohydrin) creping adhesive. Based on ART measuring 5-second cure time dry adhesion, initial structure-activity-relationship conclusions were drawn. Factors that effected the design included diacid chain length, epichlorohydrin loading, amine loading in the copolymer, and amine type in the polyamide.

A second series of performance tests used a wet ART test. Compared to dry ART testing, wet ART testing introduces two new parameters, the initial sheet moisture and the amount of time that the dried adhesive film is allowed to stand in contact with the wet sheet. The three-dimensional structure provided by the covalent crosslinking of the two polymers provided improved

adhesion relative to standard commercial PAE adhesives in some of the experimental samples evaluated in both the ART and wet ART tests, but further performance assessments were needed to select a final candidate and to understand the structure-function relationships and improved adhesion.

If too much of the adhesive is removed with the sheet by the creping blade, the adhesive will not provide good sheet control or effective Yankee surface protection. One way to test the ability of the adhesive to stay on the Yankee is to test the solubility/strippability of a dried film of the polymer by applying 60°C swirling water for 60 seconds. Unfortunately, in terms of persistence, little differentiation appeared between the selected experimental samples. A final performance test assessed the ability of the film to absorb water. The ability of a cured adhesive on the Yankee surface to sufficiently re-wet when contacting the incoming wet web is important for adhesion and sheet control. Films of the adhesive or mixtures of adhesive and PVOH were cast and dried, and the amount of weight gain when the films were exposed to a fixed amount of water was assessed. This test revealed that one sample was significantly different from the others and demonstrated the most consistent level of water uptake across all the levels of PVOH in the system. This new creping adhesive has been marketed by Solenis as Crepetrol™ 9200.

Case histories

Two case studies verify the effectiveness of the Crepetrol™ 9200 adhesive. In the first case study, an older, fairly slow tissue machine running 100% recycled furnish was switched from a standard thermosetting PAE adhesive to the new product with all other parameters remaining constant. After the switch was made, the sheet was visibly tighter coming off the Yankee and the customer was able to remove six pounds per tonne of wet end debonder while maintaining the same level of softness (handfeel panel testing). The crepe structure of the sheet was visibly better to the naked eye. In the second case study, a machine producing facial tissue from 100% virgin NBHK ran nine creping adhesives head-to-head to determine which adhesive allowed them to produce the softest sheet with all other parameters being held constant. According to the panel testing conducted after the trial, Crepetrol 9200 produced the best handfeel score.

Todd Sarraf is global marketing director, tissue and towel, Solenis and Ronald Staib is technical director, global technology, Solenis.

REFERENCES

- (1) Pascal Rivard, Qu-ming Gu "Novel Enzymatic approach new possibility for recycled Tissue and Towel Manufac2turers"
- (2) John Hochu, John Harrington "Second Generation Advanced Retention and Drainage Technology Continues to Improve Operational Efficiencies and Reduce Operating Costs"
- (3) Mark T. Crisp and Richard J. Riehle "Polyaminopolyamide-epichlorohydrin (PAE) Wet Strength Resins for Improved Health and Sustainability"
- (4) Joseph Mahoney "High Performance Creping Adhesive"

By Nalco's Michael Murcia, Mita Chattoraj, JC Ye, Steve Hoefs

Improved DAF control delivers water savings and minimises TCO. A TW report

Dissolved air flotation (DAF) units are used throughout the paper industry for solids / liquid separation in process and primary wastewater treatment applications. The performance of these DAFs is often left to manual control schemes that are dependent on the operations staffs' ability to recognise and adjust their treatment strategy in response to changes in influent loading demand. Failure to make the necessary operational adjustments can lead to decreased solids capture and poor effluent water quality, causing downstream operational concerns; plugged showers, filters, overloaded secondary treatment systems, exceeding discharge limits, etc. To improve overall DAF performance, a comprehensive monitoring and control system is needed to manage the performance of this critical mill asset.

Nalco has developed 3D TRASAR™ Technology for DAF operations which utilises advanced sensors, feed forward/feedback control algorithms and a sophisticated cleaning methodology to ensure reliable real time data collection and chemical control for the DAF. This system improves effluent water quality and consistency while optimising the DAF total cost of operation (TCO). Through customer case histories, the presentation will review the actual performance results achieved through use of this technology.

- Improved DAF effluent quality and consistency
- Maximised recycle / reuse opportunities for DAF effluent
- Overall optimisation of total cost of operation for the DAF, which includes a reduction in manual intervention of plant operations, optimization of chemistry, and reduction of downstream upsets

Dissolved air flotation units (DAF) are used throughout the paper industry for solids / liquid separation. Within the DAF system, compressed air and chemical separation aids (coagulants/flocculants) are used to assist in the separation (flotation) of solids and contaminants from the incoming process stream. Many DAF systems are treated with both a coagulant to neutralise system charge and a flocculant to aggregate small particles to larger flocs. However, depending on the nature of the process stream, some systems will use only a coagulant or flocculant as a separation aid. When dosed properly, the separation aids create large particles from the small, finely dispersed suspended solids which float to the top and are removed from the DAF.

Unlike some chemical additives, simply increasing the concentration of a separation aid in a DAF will not always result in a reduction in suspended solids of the DAF effluent. While it is necessary to dose some coagulant and/or flocculant to properly neutralise the charged elements in the process stream and allow proper flocculation, over-dosing these additives can result in charge reversal, resulting in the stabilisation of the small, colloidal solids. Therefore, there is an optimum range of chemical additive concentration that leads to separation, where above and below this range will result in poor suspended solids separation in a DAF (Figure 1).

DAF effluent upsets from the under or over feeding of separation aids can lead to a variety of operational problems. In cases where the DAF effluent is being reused in place of fresh water on machine showers, filters, process make-up water supply, etc, additional TSS loading can cause nozzle or filter plugging. In the

T C L-r: Michael Murcia, Mita Chattoraj, JC Ye, Steve Hoefs



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case where the effluent is discharged to the wastewater treatment plant, swings in TSS from the DAF can lead to unstable biological treatment in the secondary treatment plant and possible fines from permit violations and unnecessary surcharges from high solids discharge.

The control of separation aid dosing in DAFs today is typically highly manual, requiring a high degree of operator involvement. Coagulant and flocculant demand will vary with changes in the incoming water quality. As a result, operators struggle with trying to keep pace with these system changes, resulting in effluent water quality variability and upsets. Because of the nonlinear response of the coagulant /flocculant separation aids, operators frequently overdose chemistry in response to system upset further compounding the effluent water quality concerns.

Attempts have been made to automate separation aid addition using flow-based chemical control strategies that maintain a given chemical concentration across a variable system load based

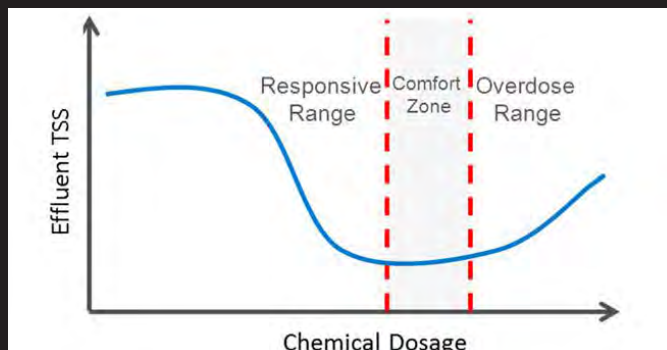


Figure 1. The optimum chemical dosage range will vary with the coagulants and flocculants being applied, as well as the charge demand and concentration of the suspended solids in the wastewater

By Nalco's Michael Murcia, Mita Chatteraj, JC Ye, Steve Hoefs

upon volume. However, this technique does not take into account changes in system charge demand, which can produce incomplete charge neutralisation or charge reversal resulting in variability in effluent water quality.

A variety of online measurement techniques have been developed to assist in the monitoring of DAF influent and effluent water quality. However, one of the major obstacles in monitoring the solids loading online is the accuracy of the measurement in the harsh conditions where sensor fouling and system entrained air can render the measurements useless. Such online sensors are often installed and subsequently abandoned when it is found that they require too much maintenance to keep clean or are generating inaccurate data.

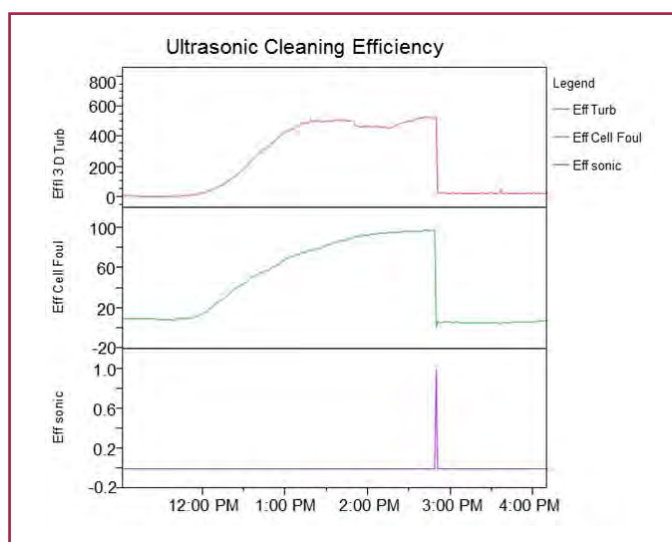


Figure 2. Demonstration of effect of cell fouling on turbidity reading accuracy and effectiveness of ultrasonic cleaning on restoring reading integrity

However, in plants where online monitoring of the DAF effluent is reliable and accurate, signals generated by the sensors are often used simply to monitor the DAF performance. The complexity of using the online readings and identifying the proper separation aid dose without under or over dosing requires advanced algorithm logic beyond what is typically used in industrial PLCs (PID). Utilising simple PID control in an application that can experience under and over dosing inevitably leads to over dosing, charge reversal and poor DAF effluent quality.

Further complicating the development of an automated control strategy is the variable lag time from when a swing in water quality or flow rate will be sent to the DAF and when it will begin to impact the effluent quality. This time lag can range from a couple minutes to an hour depending on how the DAF is set up, making standard control strategies difficult to tune to properly compensate for the delay time.

Commercial automation offerings to date have proven to be largely ineffective or overly maintenance intensive due to the nonlinear nature of chemical demand in wastewater, as well as the high potential for sensor fouling (Gerry, 2002; Zhen, 2009; Vanrolleghem, 2003; Harremoës, 1993 and Scully, 1998). Therefore, availability of a cost effective system that delivers automated, reliable, performance-based control of chemical addition for Paper DAF systems has been an unmet need.

AUTOMATION APPROACH – 3D TRASAR Technology for DAF operations



Figure 3. 3D TRASAR Technology for DAF skid

Reliable measurement of DAF effluent quality is essential to determine the necessary chemical dose needed in the DAF. With the objective of developing an automation system platform that can be used in DAF systems in a variety of industries and water streams, Nalco developed 3D TRASAR Technology for DAF operations. Given that the DAF process is designed to separate suspended solids (Rickard, 1917) and that suspended solids scatter light (Briggs, 1962), turbidity was selected as the universal water quality measurement to determine DAF performance.

The 3D TRASAR Technology for DAF systems analyse the DAF effluent and optionally influent, depending on the control strategy selected, to optimise the separation aid addition to maintain the DAF effluent at a predetermined turbidity level. The approach contains a number of unique features that allow for accurate / reliable system monitoring and control.

To address a common problem of sensor fouling experienced by most online measurements in a high solids process stream, several features were built into the system to improve reliability and reduce the need for maintenance. For the optical turbidity measurement, a 3D TRASAR turbidimeter was developed for this offering, which is capable of measuring a range of turbidity from 0-8000 NTU, spanning the majority of industrial DAF applications.

Understanding that any level of deposit formation on the turbidimeter surface could compromise reading accuracy, a unique ultrasonic cleaning approach was developed to periodically clean the turbidimeter. In addition to the automated ultrasonic cleaning, the 3D TRASAR turbidimeter has the capability to measure the degree of fouling on the optical sensor's surface. This ability allows the ultrasonic cleaner to be triggered on demand

By Nalco's Michael Murcia, Mita Chatteraj, JC Ye, Steve Hoefs

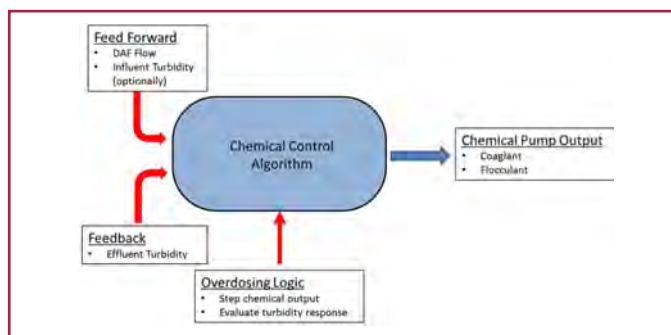


Figure 4. Overview of variables contributing to the chemical dosage calculation in 3D TRASAR Technology for DAF

based on a threshold level of fouling measured by the 3D TRASAR turbidimeter, ensuring the turbidimeter remains clean and reports accurate readings. This fouling measurement is also important when the system is in automated control. In the event the fouling builds up to a critical level and the ultrasonic cleaning system is unable to remove the deposit, a fouling alarm is generated, and the control of chemical dosage is put into a fail-safe operation until the turbidimeter is serviced and the alarm cleared.

In cases where the influent stream contains large particles that could interrupt flow through the system, an automated solution was developed to remove blockages from the instrument plumbing. Automated pneumatic ball valves are used to isolate the instrument plumbing and compressed air is subsequently injected to back-purge the system to remove any blockages that stop the sample from flowing. As is the case for ultrasonic cleaning, the compressed air purge is controlled by the 3D TRASAR controller. However, just as the integrated fouling measurement is used to trigger ultrasonic cleaning, an onboard flow metre is used to identify the loss of sample flow from a blockage in the instrument and trigger a compressed air purge to restore sample flow.

When sampling process water streams from pressurised pipes or in the effluent of the DAF, it is common to have some entrained air present in the water. These air bubbles scatter light similarly to suspended solids, creating an offset in the online turbidity reading, which is interpreted as artificially high solids loading. To prevent these bubbles from contributing to the turbidity readings taken by the 3D TRASAR turbidimeter, a plumbing arrangement was developed that uses the natural buoyancy of the air bubbles as a means of separating air from the sample stream being measured before the turbidity measurement is taken.

With an instrument that reliably and accurately measures the water quality in the DAF operation, Nalco developed a chemical control algorithm that uses a combination of feed forward and feedback signals to optimise separation aid control. The feed forward portion of the control is designed to change the chemical dosage rate as a function of the instantaneous changes in DAF flow and optionally turbidity loading in the DAF influent. If the chemical demand in waste streams was always proportional to the flow and incoming TSS loading, feed forward control alone would be sufficient to produce a consistent DAF effluent quality. However, due to the changing nature of the suspended solids and the differences in the ability of the DAF designs to handle variable hydraulic loading rates, as well as other mechanical variables, there is a need to adjust the chemical dosing based on the final DAF effluent quality. Therefore, a feedback component is present in the control algorithm. The contribution of the feed forward and feedback elements to the chemical dosage calculation is automatically adjusted in the 3D TRASAR algorithm to provide a consistent DAF effluent quality.

In addition to feed forward and feedback signals contributing to the chemical dosage calculation, another layer of logic is used in the control algorithm to determine whether an upset in the DAF effluent is due to either under or over dosing. In the event of an upset, the 3D TRASAR overdosing logic will adjust the chemical dosage while feed forward and feedback controls are running and observe the response in effluent turbidity. Based on the response in effluent turbidity, the 3D TRASAR over dosing logic can determine the whether the upset requires more or less chemical to correct.

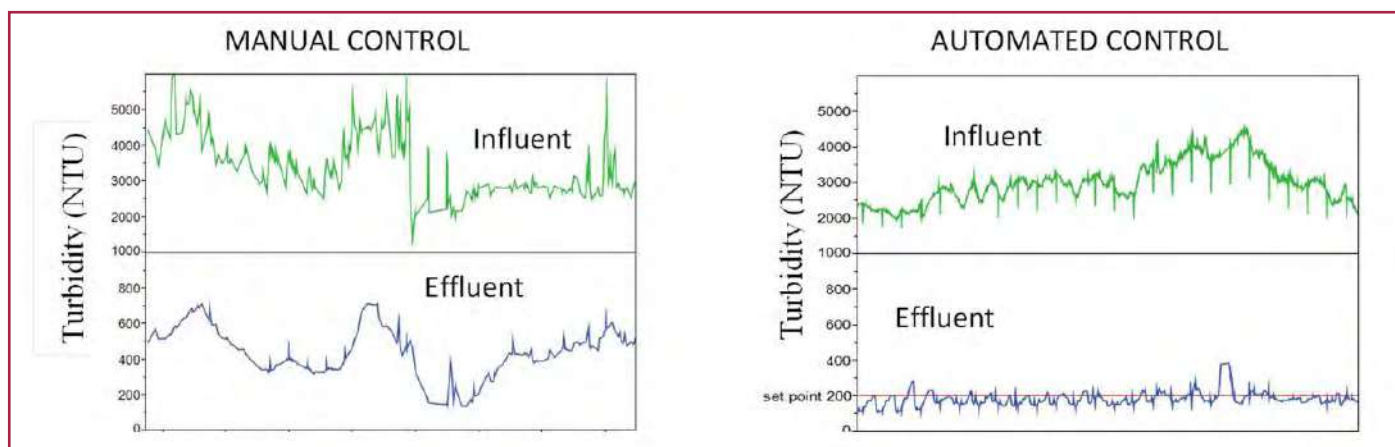
Data from the sensors is collected by the onboard 3D TRASAR controller, which has flexibility to accept and send external signal information to and from the mill DCS. Data collected by the 3D TRASAR controller can be monitored 24/7 by the Nalco 360™ Service team where the information is examined for trends, downloaded to create automated system performance reports, and used to provide alarm notification to a pre-determined contact list on system upset, such as high effluent turbidity.

The following case studies highlight the use of 3D TRASAR Technology for DAF as part of Nalco's comprehensive plan to improve DAF effluent water quality.

Case Study 1

A North American tissue mill had a corporate initiative to reduce their fresh water consumption. They had identified the DAF effluent

Figure 5. DAF turbidity removal under manual and automated 3D TRASAR chemical control. The automated control is capable of holding the effluent turbidity tightly around the set point (200 NTU)



By Nalco's Michael Murcia, Mita Chattoraj, JC Ye, Steve Hoefs

as a possible source of water to be reused back into their process but they knew that they would need to improve the quality and consistency of this effluent stream if it were to be reused. Previously the DAF effluent was being sent to the waste water treatment plant for additional processing. Under manual control, the mill was able to achieve an effluent water quality of 426 +/- 132 NTU turbidity. The mill had determined that to bring the DAF effluent back into the process would require the water quality to be improved to a turbidity level no greater than 200 NTU.

Working with the mill, Nalco, after confirming that the proper settling aid program (coagulant/flocculant) had been selected, incorporated the 3D TRASAR Technology for DAF system to assure optimal settling aid dosage was achieved at all times in response to system demand changes. Through use of the appropriate chemistry and the 3D TRASAR technology, the average effluent turbidity was reduced to 172 +/- 31 NTU (Figure 5).

The reduced variability and improved effluent water quality allowed the mill to reuse the DAF effluent back into their process displacing fresh water. This resulted in a reduction of fresh water requirements by 36 million gallons per year, representing a \$500k/year annual savings to the mill.

Case Study 2

A North American 100% recycled paperboard mill wanted to improve the performance of their DAF system while looking for ways to reduce the mill VOC footprint. The mill had used a base loaded chemical strategy for their DAF flocculant addition making adjustments based upon the cleanliness of the DAF post filter and paper machine shower nozzles. Working with Nalco, the mill reviewed the use of dry polymer chemistries to replace their current liquid flocculant program. Prior to running any dry polymer evaluations, Nalco incorporated the 3D TRASAR Technology for DAF into the current programme. Not only was the 3D TRASAR technology able to improve the DAF effluent quality and reduce the variability, it was also able to deliver an optimised concentration of separation aid reducing the overall consumption and minimizing the VOC contribution to the plant from this application. Figure 6 highlights the frequency and degree of flocculant pump adjustments made by the 3D TRASAR system in response to changing system demands and desired effluent water quality objectives.

SUMMARY AND CONCLUSIONS:

Constantly changing process water streams processed by industrial DAFs create a challenge for operators to identify the optimum dosage of coagulant and flocculant needed to achieve the desired DAF performance. This inherent variability paired with the nonlinear nature of the relationship between chemical dose and DAF effluent quality creates an opportunity for automating the chemical dosage based on real-time performance monitoring. This unmet need for automating chemical dosing in DAF systems was addressed with the development of 3D TRASAR Technology for DAF. Specific features such as ultrasonic cleaning, compressed air blockage removal and sensor fouling readings have been critical in enabling the development of an automated chemical control method by providing consistent, reliable operation of the instrument. Results achieved through the use of 3D TRASAR Technology for DAF include reduction in discharge surcharges, improved DAF effluent variability, reduction in total cost of operation, improved operator productivity, optimised chemical consumption, and the opportunity to reuse the consistently cleaner DAF effluent in the process.

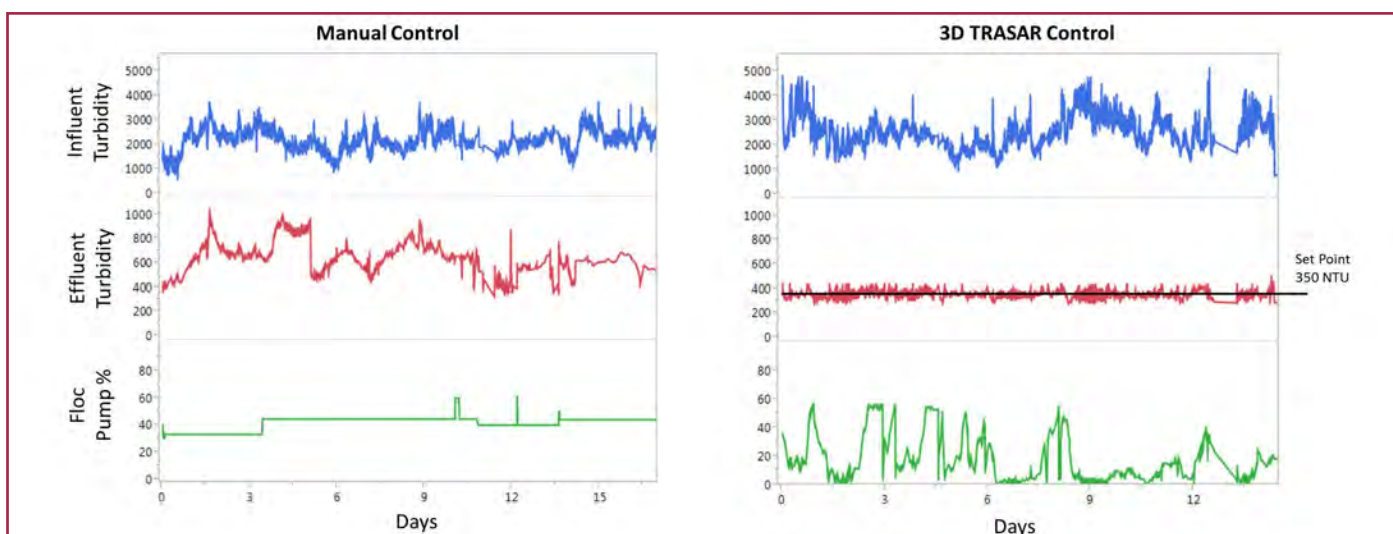
By Michael Murcia, staff scientist, Wastewater Solutions, Nalco; JC Ye, marketing manager, Wastewater Solutions, Nalco; Mita Chattoraj, corporate scientist, Core Automation, Nalco; Steve Hoefs, senior industry development manager, Paper, Water Utilities and Recovery, Nalco

REFERENCES

- Briggs, R. (1962). Continuous recording of suspended solids in effluents. *Journal of Scientific Instruments*, 39(1), 2.
- Gerry Carty, G. O'Leary, Matthew Crowe. (2002). *Water Treatment Manuals: Coagulation, Flocculation and Clarification*. Environmental Protection Agency, 85p, ISBN-10: 1840950900.
- Harremoës, P., Capodaglio, A.G., Hellström, B.G., Henze, M., Jensen, K.N., Lynggaard-Jensen, A., Otterpohl, R. and Soeberg, H. (1993). Wastewater treatment plants under transient loading - performance, modeling and control. *Wat. Sci. Tech.*, 27(12), pp71-115.
- Rickard, T. A. & Ralston, O. C. (1917). *Flotation*. Mining and Scientific Press.
- Scully, P. (1998). *Optical Techniques for Water Monitoring*. Monitoring Water Quality, Elsevier. pp15-35.
- Vanrolleghem, P.A. and Lee D.S. (2003). On-line monitoring equipment for wastewater treatment processes: state of the art. *Water Science and Technology*, 47 (2) pp1-34.
- Zhen Lianga, b, Yanxin Wangb, Yu Zhoub, Hui Liub. (2009). Coagulation removal of melanoidins from biologically treated molasses wastewater using ferric chloride. *Chemical Engineering Journal*, 152 (1), 1 October, pp88-94.

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Figure 6. DAF turbidity monitoring under manual and automated 3D TRASAR chemical control. The automated control makes multiple chemical feed rate adjustments in response to system demand changes to maintain effluent turbidity tightly around the set point (400 NTU) and optimise separation aid consumption



Defining the physical characteristics that cause tissue softness

Softness: we know it when we feel it. We try to model it with complex equations. Now we even have a pretty good test instrument available that hears it. But what are the physical characteristics that cause the differences in tissue softness? Here, Buckman's John Stitt and Holly Richardson discuss a new approach to understanding and better controlling processes that determine tissue softness.

This project was conceived to determine:

- methods of microphotography that can be used to understand and communicate properties of sheet structure and fibre bonding that result in variations in sheet softness
- determine if observable variations could be used to define small differences in softness such as those realised in creping improvement evaluations
- establish procedures for taking/providing relevant photographs for use in process improvement proposals and trial reports.

First examined were paired tissue samples with large softness differences. These samples were

manufactured using the same furnish and from the same run on the same machine. In the first phase of the study it was confirmed which visual differences could be seen under magnification and what methods to use to best see these differences. A number of examination methods were evaluated and four methods for examination of each pair of samples were chosen that together best identified softness differences.

The next phase was to compare paired samples with small differences in softness and determine if small softness differences could be seen and what physical characteristics resulted in the perceived small softness differences. Finally a confirmation run was made to verify the findings. This paper gives the reader a better understanding of what makes a sheet soft. This knowledge of physical properties that result in



softness provides a foundation for process modifications to enhance tissue softness.

"Good Tissue" is a perception of the user. It varies from person to person, and market to market. It is not always rational and can vary largely with different cultures. Softness is the most elusive and often seemingly fickle of tissue properties because it is based on consumer perception, not quantified parameters. A quest of the tissue marketers and manufacturers is to translate the respective perceptions of their markets into measurable and controllable properties. There are certain fundamental properties that influence the perception of softness and it is possible to identify and then control them for the various concepts of tissue qualities.

There is no measure nor any unit of "softness". Most measures are an attempt to correlate measurable properties with perceived levels of softness. For example, the latest, perhaps most widely accepted, test instrument, TSA, correlates with sounds when rubbing the sheet in a controlled manner. Creping is elusive because so many factors influence softness and

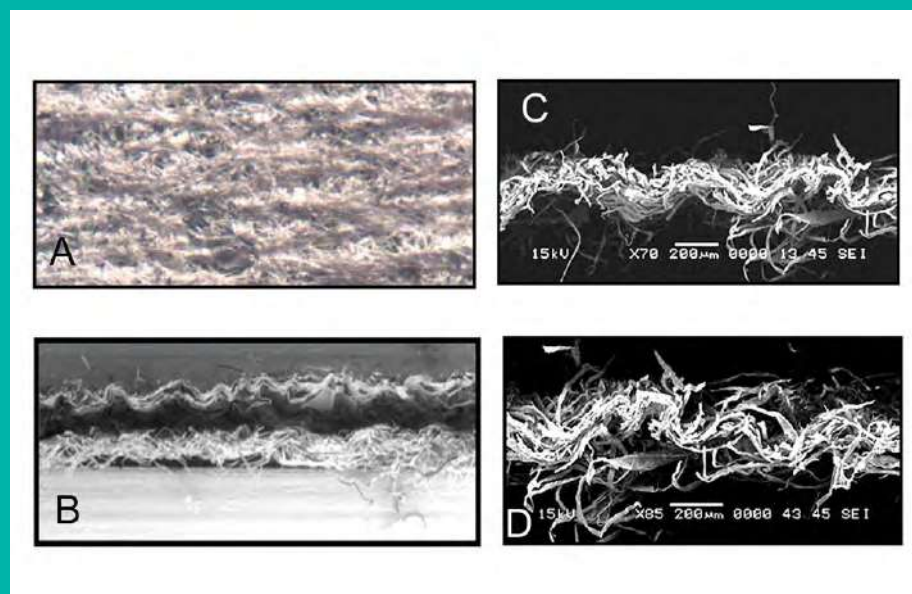


Figure 1. A through D In this graphic are presentation and advertising photographs of good creped products used by our company for years. What do we see that makes them good? Can we quantify or at least compare these with other similar products, but of differing quality and see differences? A&B are very soft facial tissue. C and D are dry crepe towel and ATMOS structured tissue towel.

SOFTNESS CONTROL TREE

(Partial for illustration Purposes)

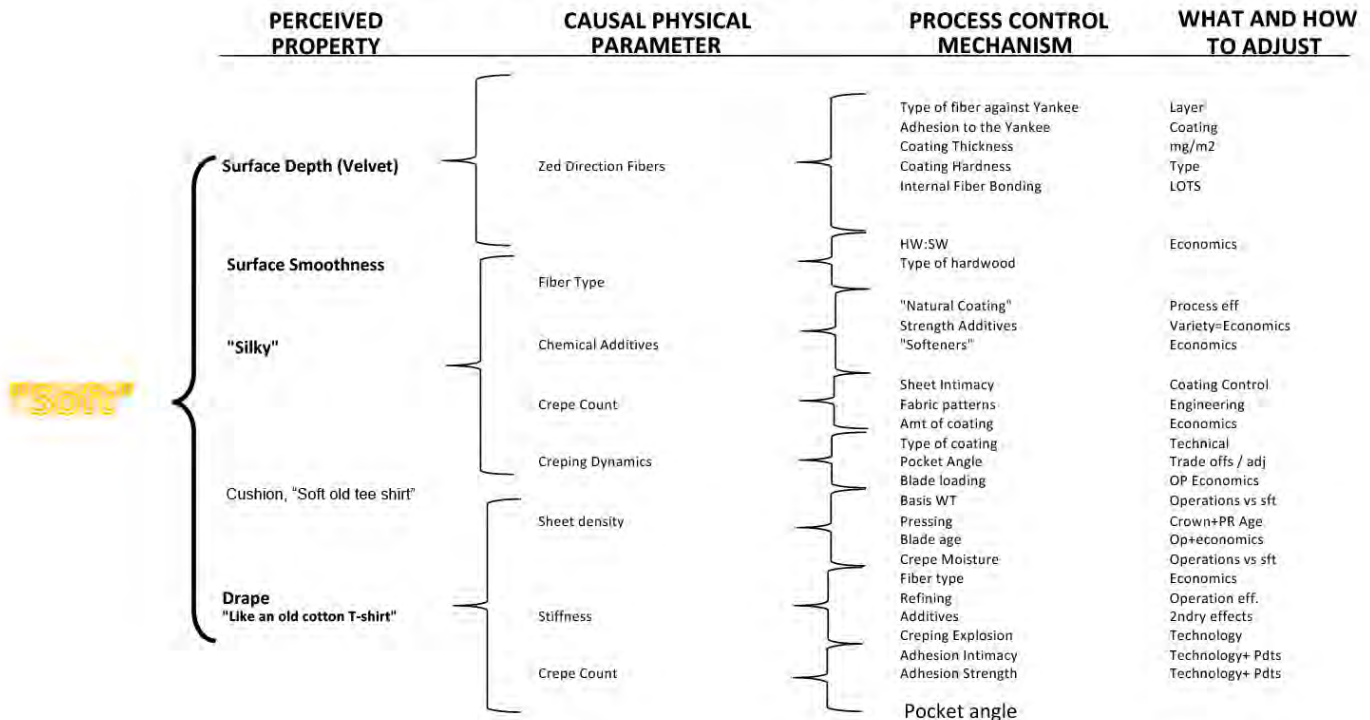


Figure 2. In this incomplete example one can see the complexity of controlling softness. For those who wish to pursue a complete matrix for maximising their concept of softness, there is a tool called Quality Function Deployment (QFD).

they are confounded with each other. Using fibre morphology knowledge, creping theory, experience, and microphotography skills this study attempts to better understand the basic sheet structures that result in perceptions of good softness.

Identifiable reasons why a sheet is soft include:

- Crepe explosion – (bulk to basis weight ratio, MD stretch to crepe ratio or, CD stretch, fibre bonding, quantifiable)
- Crepe count (fineness of macro crepe), the nature of the surface, and the balance of macro and microcrepe
- Stiffness (fibre type, intra fibre bonding)
- Refining (intra fibre bonding, strength/fibrillation, stiffness)
- Polymer filling and bonding (stiffness, low bulk:bw)
- Fines and ash (low sheet to basis weight, stiffness)
- Surface feel (zed direction fibre on surface, fibre depth, sheet explosion)
- Compaction (forming, pressing, wet vacuum, drying dynamics)
- Since there is no one property that directly results in "softness," it is logical that a specific combination

of properties must result in one of the types of perceived softness.

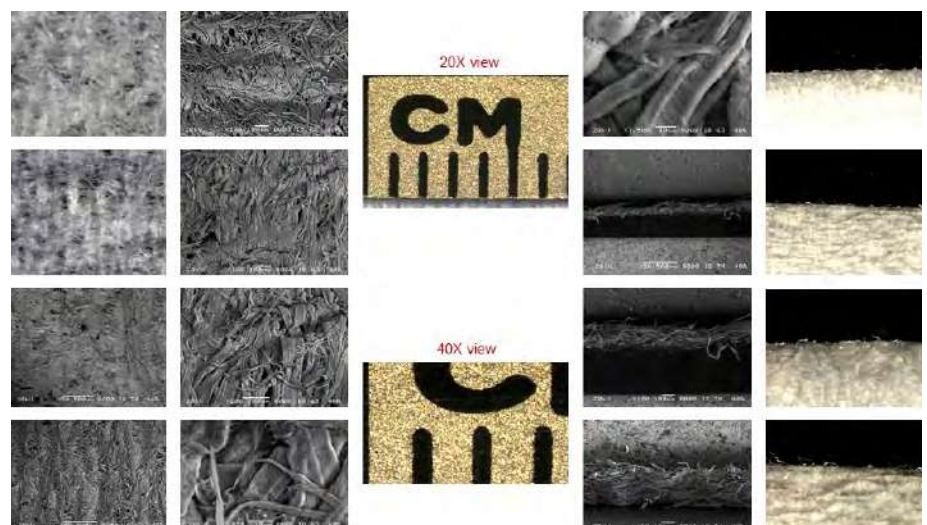
Softness directly influencing factor categories:

- Sheet density – drape, cushion, stiffness
- Strength – stiffness, drape, not like a soft old tee shirt
- Surface depth – fibre attachment and explosion (bulky feel)
- Surface properties – creping geometry and dynamics

PHASE 1 – proving methodology

In the first phase of the study it was confirmed which microscopy and photography methods to use to see differences. A number of examination methods were evaluated, and four techniques for examination of samples were chosen that together best identified softness differences. The four techniques chosen were

Figure 3. Phase 1 Results: A number of photographs from which we selected those most "visually vocal" types of photographs that show relationship to quantifiable parameters.



By Buckman's John Stitt and Holly Richardson

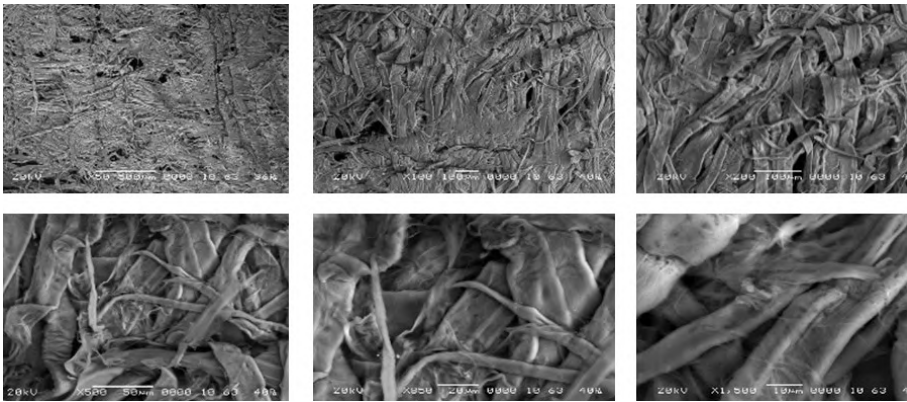


Figure 4. SEM photographs of the top surface of a sheet with magnifications ranging from 50X to 1500X. Following in Phase 2 you will see the very significant findings of this high magnification study

at 20X to 100X. Lighting techniques used were oblique, angular, and back lighting. A photographic summary of this phase is shown in Figures 3 and 4.

Phase two

Paired sets of closely matched reel samples of tissue with a large softness difference were looked at and panel evaluated at 50 and 85 softness. The aim was to see if there were differences in similar sheets with such a large difference.

1) a low magnification surface view where we examined crepe count and nature of the crepe. 2) Ultra high magnification of the surface, where we are looking at microfibril bonding, fibre morphology and fiber/layer structure. 3) Folded edge view where the primary focus was on zed direction fibres emerging from the surface which give a deep velvet-like feel. 4) Cross-sectional view where we can see crepe structure, debonding (bulk vs. basis weight - cm³/gm.). Because of the difficulty of the cross-sectional sample preparation, this view was used less than the other three. Folded edges were examined with a stereoscope and optical microscope

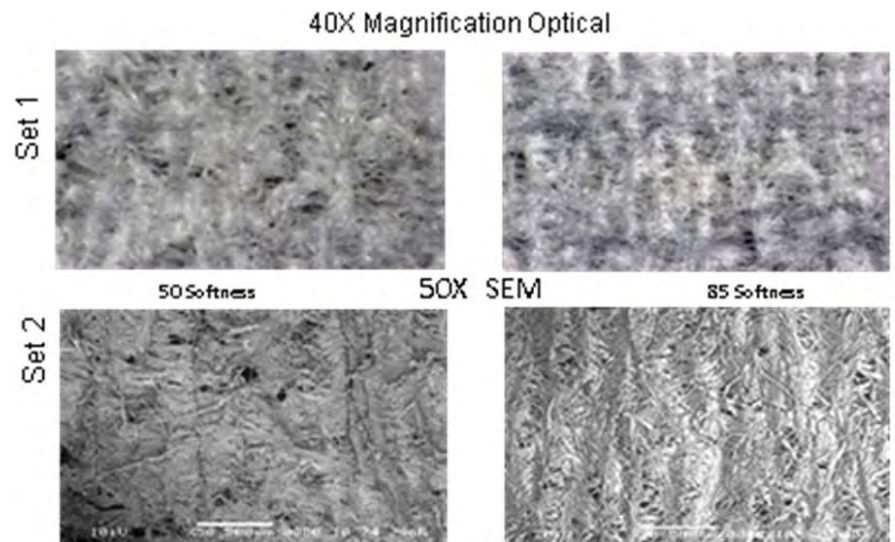


Figure 5A. Set 1, Low magnification optical microscope pictures of the sheet surfaces. Set 2 almost identical magnification with SEM shots of the same surfaces. 85 softness shows finer crepe and more amplitude to the crepe.

Figure 5B. Sheet Surface Differences Most Visible at 1500X. (Little SEM difference seen with surface photos at lower magnification.) Visible Differences: •Increased lumen collapse •Microfibrils increasing strength and stiffness •Tighter packing of fibre

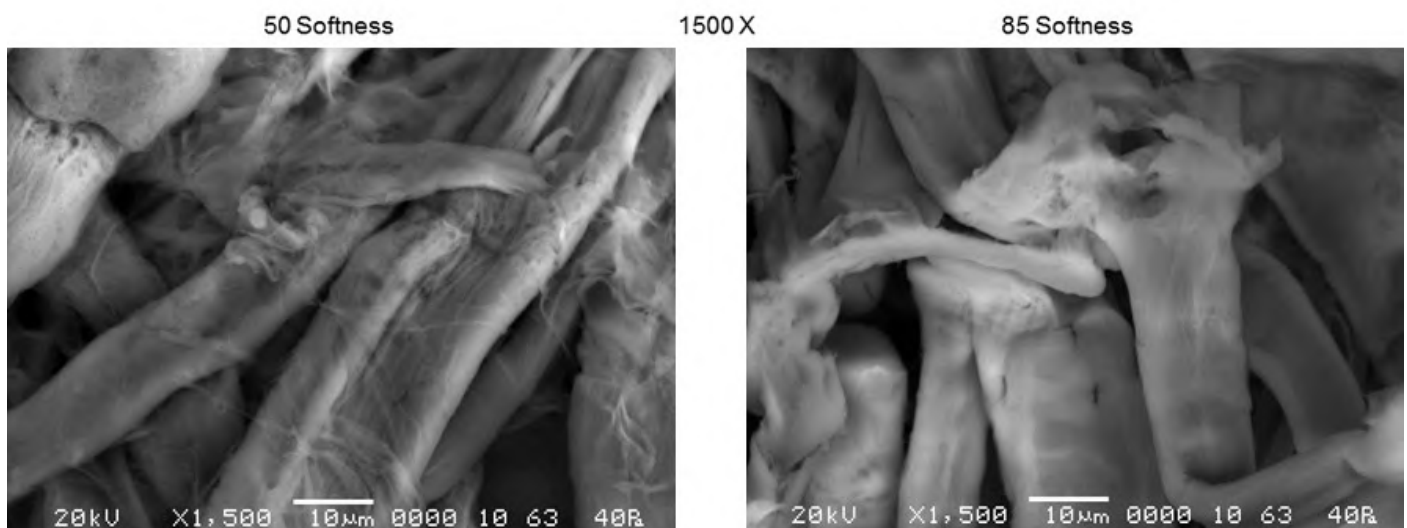


Figure 5C. Folded Surface View: Evaluation of surface depth (velvet) feel. Visible differences are fewer zed direction fibres on lower softness sheet; the 50 softness obviously has fewer vertical fibres. 85 softness fibres are longer. 85 softness fibres are thinner.

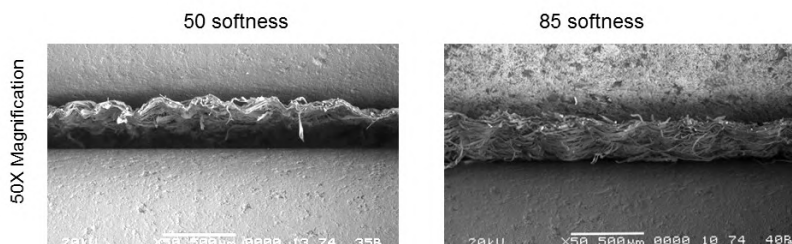
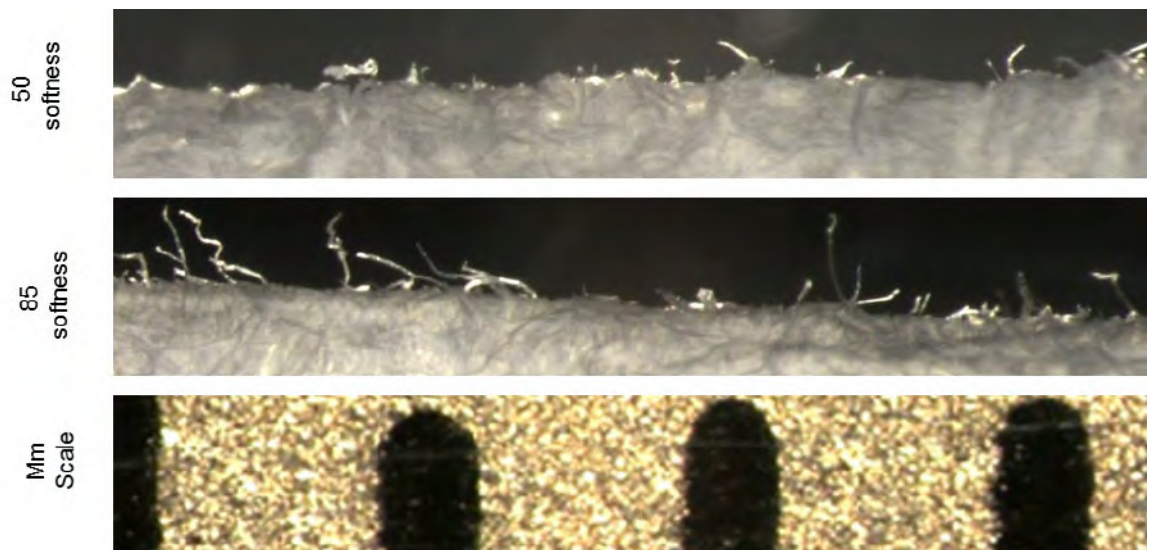


Figure 5D. Edge View Comparisons: Visible Differences. 50 softness has more pronounced macrocrepe, 85 shows only a minor hint of macrocrepe (sine wave) and a predominance of microcrepe (explosive mechanical debonding). 50 is a dense/compact sheet, lower bulk:bw, 85 shows more explosion therefore "fluffiness". 85 obviously higher bulk:bw ratio.

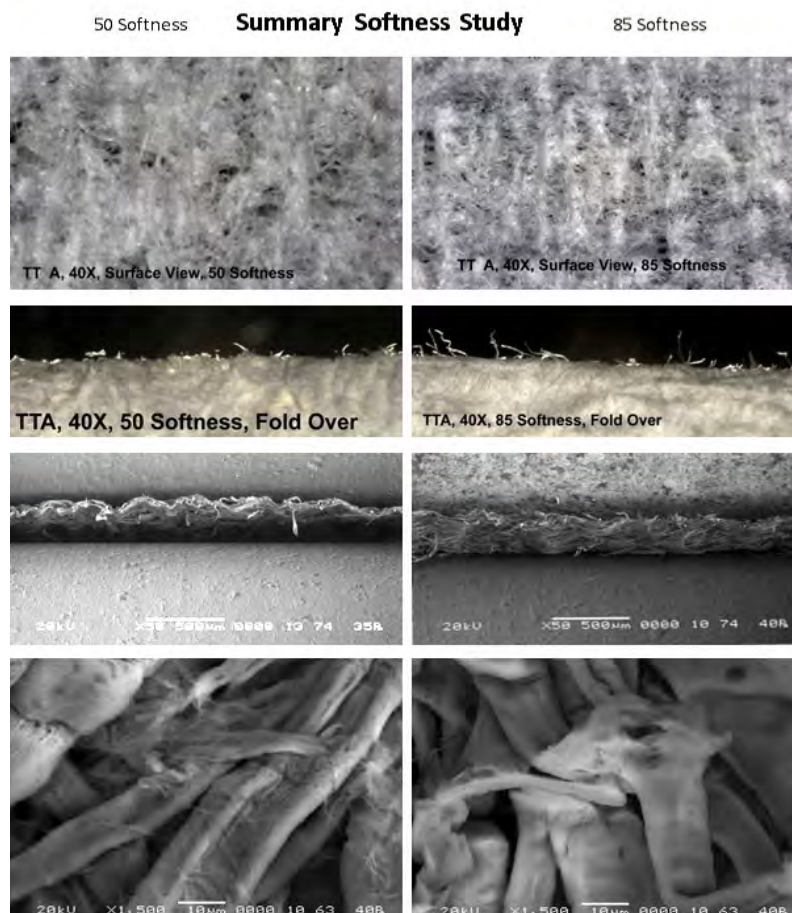


Figure 5E. Summary presentation of the 4 types of evaluations shown in one composite photograph. We do see significant differences and can relate those differences to causal process parameters. Creping geometry and adhesion in the upper three comparisons plus fibre morphology and stock preparation in the lower photograph.

The sheet surfaces were looked at using an optical microscope and a Scanning Electron Microscope (SEM) with 20X to 1500X magnification. Cross-sections of sheet structures at 20X to 200X with examined with the optical microscope and SEM.

Figure 5E is a summary of the Phase 2 study. The question was answered: large differences in softness can be seen and even the cause of the difference can be defined using microphotographs.

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By Buckman's **John Stitt** and **Holly Richardson**

Phase three

The purpose was to evaluate samples with small differences in softness (five to 10 points on the Scott/TSA 100 point scale) using three, and sometimes four methodologies (2 types of surface views, one optical

folded sheet, and sometimes one cross-sectional view,) as per the procedures of Phase two. The results of this study are shown as follows.

Small Difference Evaluation two

In reference to Figure 7, with a 10 point

panel softness difference, physical property differences are visible. Neither the folded edge views nor the 1500X SEM microphotographs showed any significant differences. The SEM and 40X optical surface microphotographs do show a difference. The 60 softness sheet photographs show a clumpier appearance with thick then almost open areas. The SEM 50X surface scans show a very significant difference.

While the 70 softness crepe is fine and with uniform microcrepe, the 60 softness sample shows a pattern of coarse crepe followed by a few peaks of fine microcrepe then another large coarse crepe.

This is typical of a sheet creped with poor attachment to the Yankee surface and a relatively closed pocket. What is needed based on this comparison is better control of the sheet attachment.

Figure 6. Small Difference Evaluation 1: Here we see in the view of zed direction fiber a slight improvement in the softer sheet. Although the crepe count is almost the same in both sheets, the right picture shows a difference in structure relating to coarseness and better drape.

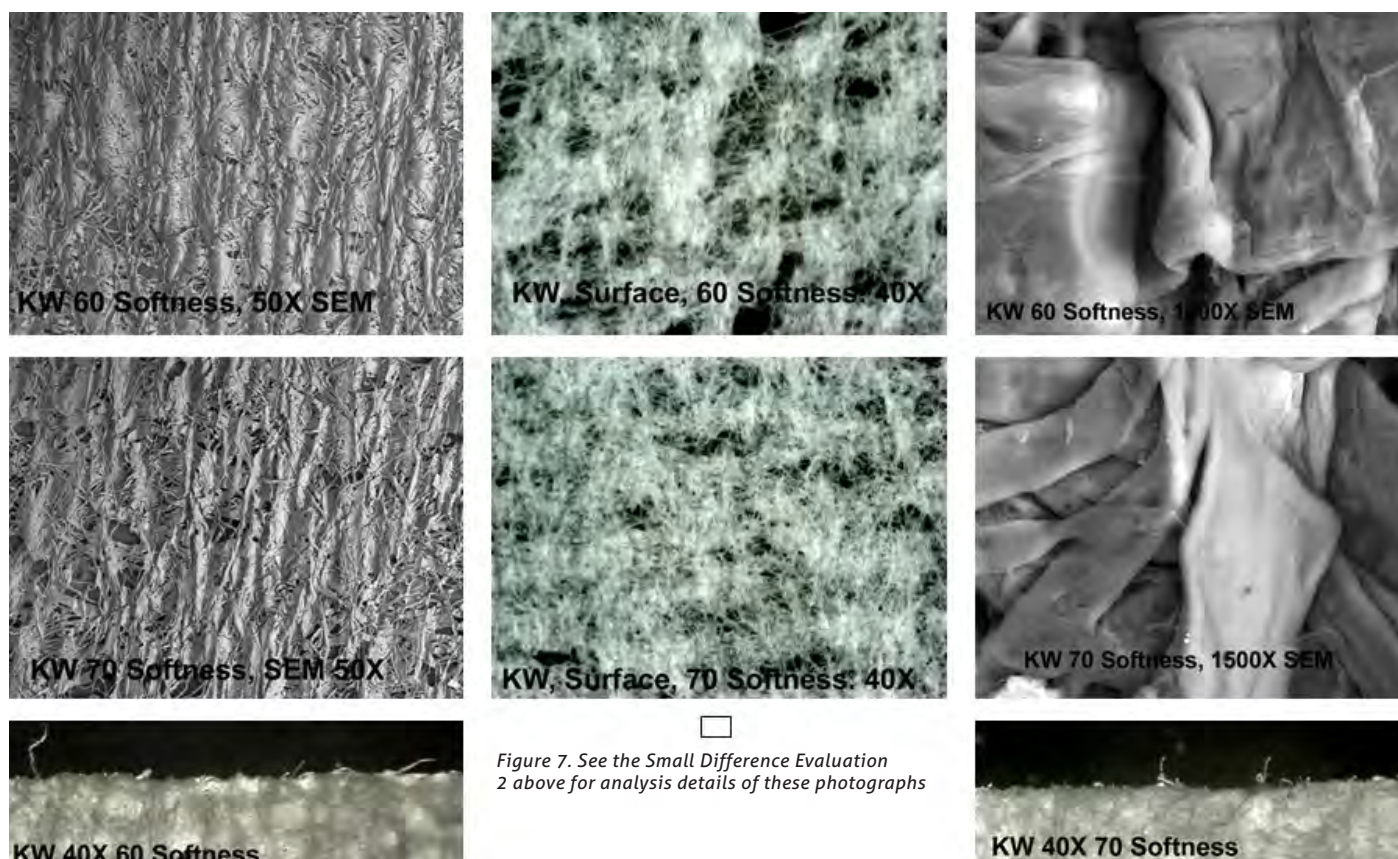
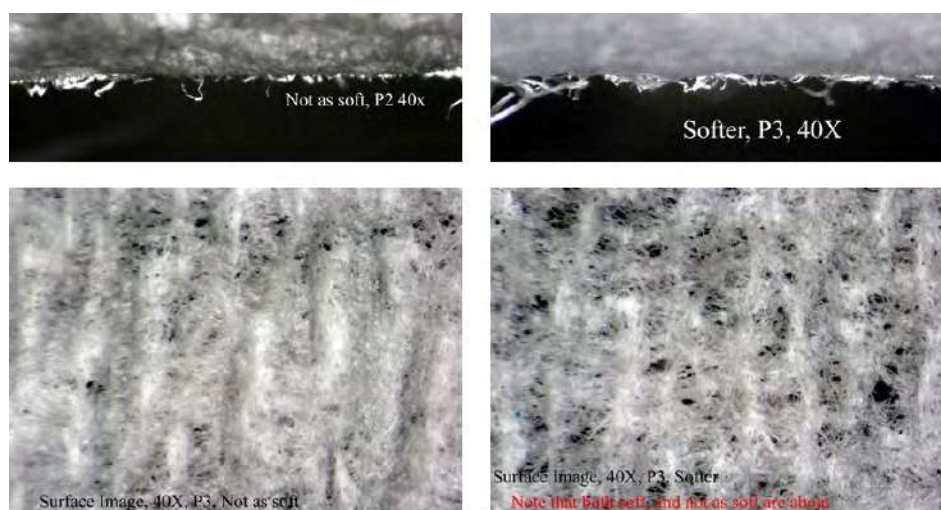


Figure 7. See the Small Difference Evaluation 2 above for analysis details of these photographs

By Buckman's John Stitt and Holly Richardson

Phase four

To confirm the methods, almost identical toilet tissue sheets were made on a pilot tissue machine. Three tissue sample sets made with different wetend chemistry and creping operations for relative softness were examined. The samples, A, B, and C, the softness of the sets were ranked by only photographic evaluation by creping professionals (Figures 8A and 8B). The duplicate samples were given to a softness panel of five non-tissue industry people, mostly women, and they were asked to rank the samples "Softest", "Middle Softness", or "Least Soft". The panel members were not shown the pictures nor were the creping professional rankings from the photograph disclosed. The goal was to have the photographic evaluations correlate well with the panel results.

The results from the panel test were:

- The five people were asked to rank the softness and state why; all five people voted the same.
- **A - Softest** - because "smoother, cottony, velvety"
- **C - Middle** - "stiff but not as stiff as B, felt more like 100 thread count sheet, softer than B"
- **B - Least soft** - "because of texture, stiff, rough, peaks and valley feel."
- Their ranking is 100% correlated with the ranking made by creping experts looking at the pictures.

Conclusions

When customers, a panel, or TSA detect a softness difference of 10 points or even less, it is possible to visually find the differences in the sheet that result

in the difference in perceived softness. No one type of microphotograph will always explain a difference in softness; but, with a number of photographs, a person or persons familiar with tissue processes, especially creping, can determine what are the possible causes for the difference and what are the best actions to take to improve the softness. With the analysis of tissue process experts, significant softness causes can be identified, and operations management can implement specific process improvement plans based on microphotography analysis. Microphotography of tissue sheets can be a valuable tool in determining a path forward toward improving softness or as a diagnostic tool for softness issues.

This article was written by John Stitt, Buckman's global specialist for tissue processes and creping, and Holly Richardson, Buckman's master industry chemist, technical services.

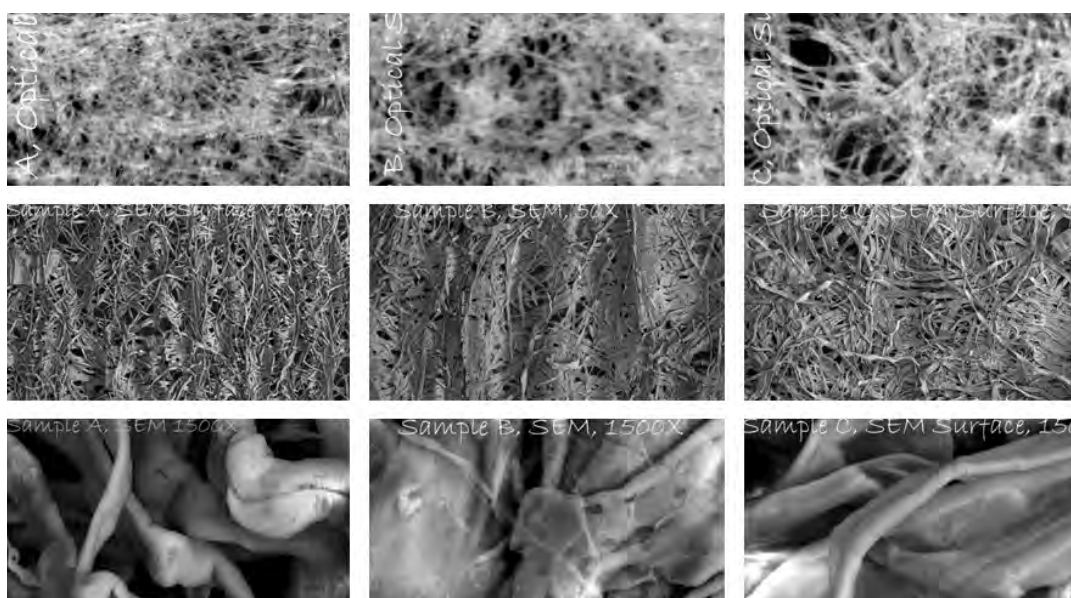
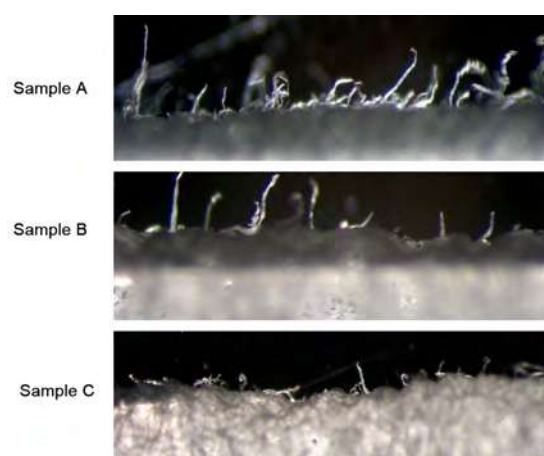


Figure 8A. First picture of the confirmation study (See Text)

'Their ranking is 100% correlated with the ranking made by creping experts looking at the pictures.'



Events Calendar

Event	Date	Location	Website
China Paper 2014 Shanghai	September 15 - 17, 2014	Shanghai, China	www.chinapaperexpo.cn/index.html
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What is your company's primary field of business (tick all that apply):

A. INTEGRATED TISSUE PRODUCTS MAKER

Primary business making paper and producing:

- ☐ Consumer (At Home) Finished products
- ☐ Away-from-Home (AFH) Finished products
- ☐ Other Tissue Grades, please specify:

B. JUMBO ROLL SUPPLIER

- ☐ Jumbo Roll Maker, for sale to converters

E. SUPPLIER TO THE TISSUE INDUSTRY Please check all that apply:

- ☐ Paper making machinery
- ☐ Fabrics, felts, clothing
- ☐ Drying technologies
- ☐ Process automation and control
- ☐ Water treatment, environmental and effluent control
- ☐ Dust control and air treatment systems
- ☐ Doctors and creping blades
- ☐ Deinking
- ☐ Stock preparation, fiber processing and pulping equipment
- ☐ Fibers: Market pulp and recycled fiber
- ☐ Chemicals and chemical technologies
- ☐ Converting machinery and supplies
- ☐ Printing machinery and supplies
- ☐ Inks, glues and dyes
- ☐ Embossing rolls

C. TISSUE CONVERTER

Primary business is converting jumbos and producing:

- ☐ Consumer Finished products
- ☐ Away from Home (AFH) Finished products
- ☐ Other Tissue Grades, please specify:

D. RETAILING AND DISTRIBUTION

- ☐ Retailer
- ☐ Broker
- ☐ Distributor
- ☐ Knives and blades
- ☐ Folders/interfolders
- ☐ Cores and coreboard
- ☐ Wrapping/Packaging equipment and supplies
- ☐ Transport and logistics
- ☐ Energy and Power
- ☐ Testing machines
- ☐ Engineering
- ☐ Consulting services. Please specify field:
- ☐ Dispensers and dispenser systems
- ☐ Insurance and financial services
- ☐ Used machinery
- ☐ Media, press, information services
- ☐ Other (please specify):

Signature

Date

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For advertising enquiries contact
Paolo Rampetta at paolo.rampetta@ubm.com

For editorial contact
Helen Morris at helen.morris@ubm.com

For media partnerships contact
Gautam Jatwani at gautam.jatwani@ubm.com



Editorial Headquarters:
UBM Media (Singapore) Pte Ltd | 6 Shenton Way
#15-08 OUE Downtown 2, Singapore 068809
Tel: +65 6592 0888 ext. 886 | Fax: +65 6438 6090 | www.ubmasia.com

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