TISSUE AND TOWEL SEGMENT LEADS INDUSTRY IN VALUE AND SPEED

ROBERT P. QUARLES

SOFT PRODUCTS SOLD BY TOUGH COMPETITORS CHARACTERIZE THIS GROWING SEGMENT OF THE PAPER INDUSTRY.

THE TISSUE/TOWEL segment of the U.S. paper industry represents just 6% of the more than 100 million tons of paper produced annually. Yet this 6.8 million tons of paper represents a full 11% of the paper value of the finished products produced in the United States and 15% of the value after conversion. The bottom-line impact of this consumer-oriented market is even greater when you consider the integration of mills and markets. In both the consumer and commercial & industrial (C&I) segments of the tissue/towel market, producers are also direct marketers.

Most of the big names in this market have been in the business for decades. Yet, tissue/towel is a mature market segment that refuses to act like one. In January of 1995 Procter & Gamble, Fort Howard, James River, and Scott each owned about 16% of the U.S. capacity in this nearly 7 million tpy market. Kimberly Clark and Georgia-Pacific each accounted for 8% of the market with Chesapeake at 5% and all others totaling less than the market leaders.

Last year Kimberly Clark, with its purchase of Scott, held nearly one-fourth of the tissue/towel market. The most perceptive pundits hesitate to predict what the Kimberly Clark acquisition of Scott will mean to the market. However, as the dust settles on this complex transaction, the sheer size of Kimberly Clark creates new market dynamics. Suppliers and customers will be adapting to the changes for years to come.

Procter and Gamble recently announced its intent to bring two new paper machines on stream in Albany, GA. One of the machines is slated to go into operation later this year and the other in 1998. Their combined capacity will reinforce P&G's position as a top producer in the consumer segment of the market. P&G also acquired additional capacity in Europe with its purchase of VP Schickendanz in 1994. Knowing that P&G has traditionally been the market leader in its core business, one would expect P&G to be searching for additional capacity.

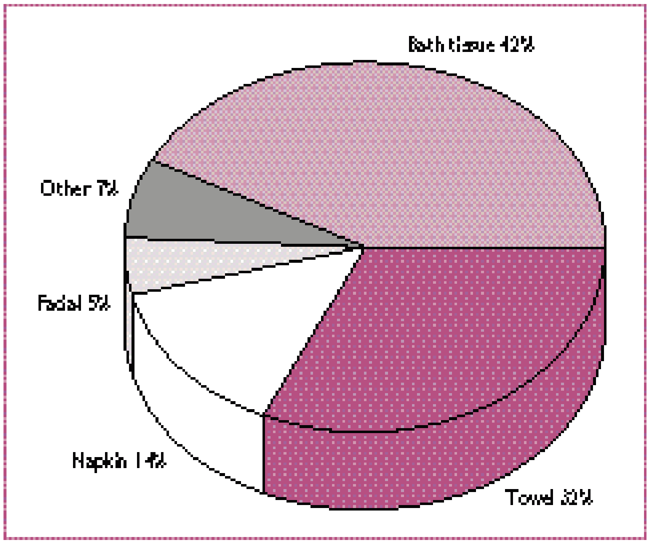
Chesapeake bought Orchids Paper and Chicago Tissue to further strengthen its position as the number two producer behind Fort Howard in the C&I market. Because of the high capital cost of a new tissue/towel machine, it is often cheaper in this market to expand via Wall Street than through greenfield expansion. Therefore, other consolidations or purchases involving James River, Fort Howard, or Georgia-Pacific could be under consideration.

TECHNOLOGY TURNS AWAY NEW PLAYERS

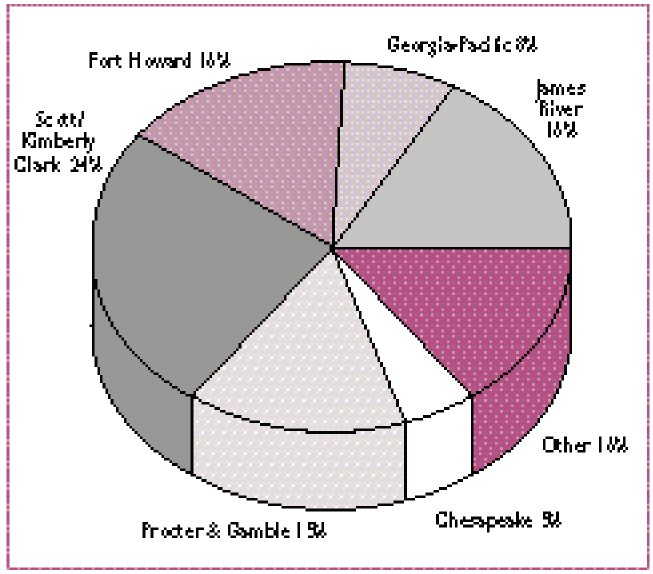
An integrated market with more than US$ 6 billion in sales on the consumer side, and total sales estimated to exceed US$ 9 billion, should attract new players. Yet the big players only get bigger. This past decade has seen just two small producers entering the market. Why does a market with projected growth above 2.5% (including fast-growing niche products) not attract new players? Technology, marketing, and brand loyalty each impose huge barriers.

The minimum requirements of a successful operation are:

- Speed—Tissue/towel machines are the speed leaders in the paper industry. Low speed producers get left behind in the profitability race.
- Recycle Furnishes—High demand for all grades of recycled pulp require experience and adaptability in the mill.
- Marketing Savvy—In both the consumer and C&I segments, the producers understand end-user desires and respond quickly to market forces.



1. U.S. consumer and C&I tissue/towel market in 1994. Producers manufactured tissue and towel at a 92% average operating rate.



2. U.S. tissue/towel capacity (estimated) in 1995

- State-of-the-Art Distribution—Finished products must arrive at stores, stadiums, shops and supermarkets on specified delivery schedules.
- Packaging Options—Single rolls, multi-packs, and jumbo packs for the same product.
- Dramatic Graphics—Tissue boxes, towel borders and bath tissue wrap highlight positioning through state-of-the-art graphics.

None of the above items are optional for success. Put them all together and a new startup operation is set to be left behind by the next shift in consumer preference or distributor requirements.

Tissue/towel is the speed leader among all segments, and has seen many advances in both chemical and mechanical technology in recent years. Twenty years ago a respectable tissue or towel machine ran at 2000 ft/min. Most new machines have the capability of running at 6000 ft/min or more, with the current U.S. sustained speed record certified at 6700 ft/min at the Bay West mill in Middletown, OH. (See article on page 93.)

At the heart of the high-speed capability of tissue/towel machines is the Yankee dryer: a 15- to 18-ft diameter, 12- to 20-ft wide cast-iron or stainless steel cylinder that dries the high-speed web in less than one second. The web starts around the steam-heated cylinder with more than 50% moisture content. Despite edge speeds of a mile per minute or more, the web is retained on the drum by creping adhesive continuously sprayed on the dryer.

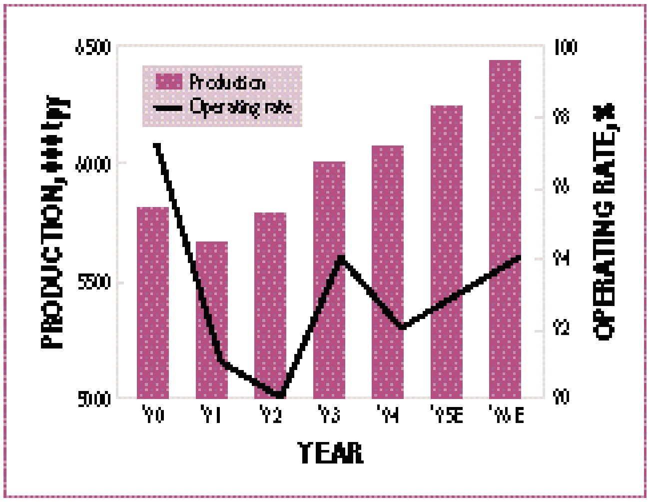
When the web completes its 300-degree trip around the Yankee, a creping doctor pushes it off at an acute angle. The severe strain of being pushed off at a steep angle would shear the web without release agents that ease the creped web from the dryer. This high-speed chemical balancing act becomes more critical as web speeds routinely exceed 6000 ft/min. Critical creping parameters are:

- Crosslinking—The right amount to ensure a uniform coating across the entire face of the dryer.
- Adhesive Strength—The right amount to hold the sheet during drying but not restrict release as the web strikes the creping doctor blade.

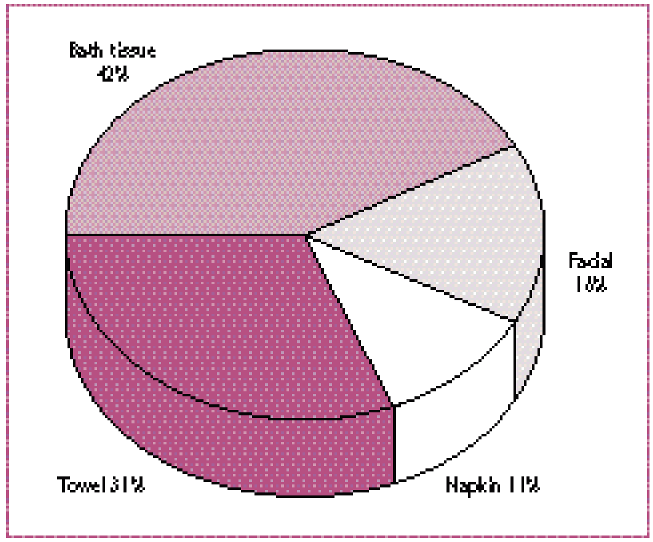
Higher speeds narrow the already tiny window for creping performance. As machine speed approaches 7000 ft/min, the correct amount of crosslinking, complemented with the correct level of adhesive, will be more critical than ever.

TISSUE/TOWEL TOPS IN RECYCLED FIBER

The tissue/towel segment also is far and away the industry leader in the use of recycled furnish. Currently 60% of the fiber passing through a tissue/towel machine is recycled, with many commercial and industrial products at or approaching 100% recycled content. Mills that could pick and choose among the finest first-use recycle material at the beginning of the decade now find themselves paying much higher prices for whatever recycle



3. Production in tons and operating rates per year at U.S. tissue/towel mills. New capacity coming on stream next year may increase annual production to nearly 7 million tons.



4. The U.S. consumer market for tissue/towel is US$ 6 billion per year.

material happens to be available. Recycle mills have found ways to continue to produce first-quality product when recycle furnish became less predictable in both quantity and quality. In the towel market, wet-strength resins can add strength to fibers, a functional property that enhances the value of the sheet. Dry-strength resins can also be used when furnishes require additional strength.

TECHNOLOGY CHALLENGES FOR TISSUE/TOWEL

In the consumer market softness, absorbency, and strength are key measures consumers use to evaluate tissue/towel products. Premium bath tissue can never be soft enough and the leaders in this segment reach new levels of softness regularly. For the value brands, the challenge is to keep softness acceptable, increase use of recycled fiber, and find more efficiency in the papermaking process.

Premium paper towels tout absorbency and strength as selling points. We all remember the top rated towel supporting a full coffee cup in the capable hands of Rosie the waitress. Still more strength and more absorbency are the goal. In the future, the top towel may boast of the ability to support a whole pot. Wet-strength resins, as the name indicates, keep towels together for tough cleaning jobs. The best towels are even replacing cleaning rags in the garage, used to clean windows, and often rinsed out and used again.

NON-PERMANENT WET-STRENGTH TOPS C&I WISH LIST

In the C&I segment of the market, building owners and managers want towels to be strong for the time needed to dry a customer's hands, then fall apart. In schools, rail stations, and restaurants, towels are tossed in commodes and eventually cause plumbing problems—problems that lead to inconvenience and expense. Non-permanent wet strength is one answer sought by C&I customers and currently under development at Hercules. With non-permanent wet strength, towels would dissolve shortly after disposal in water, making these fibers as flushable as bath tissue.

Right up with non-permanent wet strength on the wish list of recycle mills is neutralizing "stickies." Stickies are any type of adhesive resilient enough to pass through repulping. Stickies cause holes in the web, weak spots in finished rolls and are the bane of quality inspectors. A commercial process to neutralize stickies or a new chemical additive will advance quality in all recycle mills and be of particular interest to the C&I mills that rely on high recycle furnishes.

SEPARATING C&I AND CONSUMER SEGMENTS

The tissue/towel market segment has traditionally drawn a line between the consumer market and the C&I market. Consumer products are purchased from the shelves in the supermarket, convenience store or super store. C&I products are often purchased for price rather than performance or name recognition. In terms of tonnage, consumer accounts for 60% of the towel market and 65% of the tissue market. C&I sales figures cannot be so easily quantified, but the entire C&I market certainly is close to half the size of the consumer market. Most facial tissue and the majority of paper napkin production comes under the consumer side of the market. Total consumer sales are reported at US$ 6 billion per year.

Softness, absorbency, and performance drive the consumer market. Softer bath and facial tissue top the sales charts. Superior strength and absorbency separate the top towels from the value brands. Most premium consumer tissues use no recycled fiber at all; however, that could change. Today, the longest, softest virgin fibers are creped to a cushion consistency in the top brands. Moving to the value brands, the amount of recycled fiber entering the furnish will continue to increase in response to cost pressure. Bulk improvements also assist in reducing cost. Quality continues to be important to both market segments, even when selling prices decline. In fact, the focus on quality and consistency is a trademark of the tissue/towel market.

While competition is tough among the brands in both premium and value segments, product prices tend to reflect demand and cost of production. From 1989 through 1993, price cutting to build market share was the rule rather than the exception. Enhanced product performance dominates the consumer market today and should continue to be the engine that keeps this market moving.

Top consumer towel brands take the same long, strong, virgin fiber and add wet-strength resins to achieve the best balance of strength and absorbency. Just as with tissue, value towel brands use more recycled fiber and different wet-strength formulations to hold down cost.

Consumer facial tissue uses high grade fiber often with supplements to gain the level of softness required by the customer. To further distinguish their products, most producers present the product in decorator graphics. The dramatic graphics printed on tissue boxes make a strong impression and assist in the selling of top brands. Niche products also proliferate in this segment. Tissues are now impregnated with moisturizers and with aloe to protect sensitive skin. Wet or dry tissues have also entered this market.

Napkins range from premium brands that rival tissue for softness, to those with higher strength levels. Quilting, colors, embossing, and graphics—both on the product and on the package—combine to give the premium brands their unique place in the market. Value brands use less quilting and embossing, fewer colors, simpler graphics, and recycled fiber to achieve savings.

C&I STRESSES SERVICE AND VALUE

As a general rule, C&I products pick up where the consumer lines stop. C&I products begin with a significant percentage of recycled content and move right up through 100% recycled content. The C&I products sell value, consistency, and service. C&I companies produce value paper products and, in many instances, dispensers for their products. They also work with distributors who both sell product and service installed dispensers.

While C&I products don't provide the softness and absorbency of premium consumer brands, the line between consumer value brands and the top C&I products is somewhat blurred. Value-brand mills, both consumer and C&I, handle more recycled fiber per ton of finished product than any other market segment. They have the expertise to get the most out of recycled fiber.

TRENDS TO WATCH IN TISSUE/TOWEL

Consolidation is a trend to watch in the tissue/towel market. The dust has yet to settle on the Kimberly Clark purchase of Scott. Even with more change and new alignments, the tissue/towel market is healthy and predicted to grow at 2.5 to 2.8% per year in the near term.

In addition to a healthy domestic market, the big tissue/towel producers are certainly looking to emerging markets in Asia and the southern hemisphere for the growth opportunities in the next century. Paper sales track the advance of civilization, and the sheer size of the Asian markets predicts extraordinary growth potential for companies with the expertise and desire to expand.

Niche products will continue to receive attention and resources because they command premium prices and can capture market share. Improvements in mechanical and chemical systems will make many of these innovations possible, making supplier relationships closer and more interdependent.

Though tissue/towel leads the paper industry in recycled fiber use, other environmental concerns could slow the growth of this strong segment. Dyes could become a factor in Cluster Rule compliance, restricting use of graphics. AOX and VOC issues could cause the restriction of some chemicals currently in use or create the need for more environmentally friendly products. The closure of mill systems and the expense of landfilling sludge from repulping will spur the creativity of producers to resolve these issues on a mill-by-mill basis.

Mills will demand more from both equipment and chemical suppliers. In the machine clothing area, suppliers will be called on to produce new products that will allow production speeds to reach 7000 ft/min and beyond. To assist in drying and improve product performance, through-air-dry technology will spread rapidly through the industry. Most new tissue/towel machines will be built with these pre-dryers in place and the industry will be retrofitting many older machines with this newly available technology. The benefit: through-air drying reduces moisture content of the web before it reaches the Yankee dryer. Other improvements will include formation enhancement and sheet control technologies.

Moving to the chemical side, a "Wish List" mills might compile for chemical suppliers would include:

- Non-permanet Wet Strength—A feature that would serve several market niches.
- Stickies Pacification—Recycle furnish includes more and more adhesives that defy neutralization.
- Charge Neutralizers—Additives which combine with contaminants and render them harmless.
- Dry Strength—Increasing the dry strength is also a complex issue that will have a solution based on individual mill chemistry, type of furnish, and market requirements.
- New Creping technologies—Current creping chemicals can perform at the record-setting speeds documented elsewhere in this issue. Further speed increases, wider webs, and other potential challenges on the creping horizon will push suppliers to continually innovate new creping chemicals.

Despite its maturity, it moves like a much younger market, changes quickly, and demands agility and innovation from suppliers. Despite being mature, the tissue and towel segment is a paper industry leader in customer awareness, quality, and innovation. These three proficiencies are also required for suppliers who desire to do business with the top tissue and towel producers in the future. As consumers push for new and improved products, tissue and towel producers and their preferred suppliers will continue to meet the challenge. TJ

Robert Quarles is marketing manager, Hercules Inc., Hercules Plaza, Wilmington, DE 19894