

MEETING COMPETITIVE DEMANDS IN TISSUE PRODUCTION

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PROBLEMS ASSOCIATED WITH SECONDARY FIBER CAN IMPACT A MILL'S PRODUCTION COSTS, RUNNABILITY, AND PRODUCT CHARACTERISTICS. DETERMINING METHODS TO OVERCOME OR MINIMIZE THESE PROBLEMS IS VITAL TO MEET THE NEEDS OF TODAY'S DEMANDING MARKET.

IN THE PAST DECADE, USE OF RECYCLED MATERIALS IN THE pulp and papermaking process has more than doubled. At the beginning of this “green” revolution, the visible and tangible effects of recycled furnish on tissue products—specks, rough texture, stiffer feel—were perfectly acceptable to many consumers. Over time, however, tissue consumers have become more discerning, preferring recycled-content products with the quality expected from virgin fiber grades.

Whether products are made from recycled or virgin fiber, consumers are particularly concerned with the texture and absorptive capacity of the tissue products they purchase. Cost considerations are also ever-present factors for the market, leaving tissue producers to face several interrelated challenges. To achieve optimum market and production objectives, today's tissue producers contend with four main issues:

- Maintaining competitive cost-per-ton production
- Maintaining optimum mill uptime levels
- Meeting higher bulk and softness requirements
- Managing the increased use of secondary fiber.

Compounding the issues is a diverse tissue market with distinct values. The market can be broken down into two primary sectors: consumer (at home), and commercial and industrial, or C&I (away from home). Consumer product purchasers are heavily quality-driven, willing to pay more for products of perceived better quality. The C&I market, on the other hand, is more price-driven.

Three of the fundamental issues that tissue producers face—competitive cost-per-ton production, uptime efficiencies, and higher bulk and softness requirements—are

directly related to satisfying the market. Tying all of the other issues together is the industry's increased use of secondary fiber. Problems associated with secondary fiber, especially lower quality secondary fiber, impact a mill's production costs, runnability, and product characteristics.

Determining methods to overcome or at least minimize all of these problems is vital for meeting the needs of today's demanding market.

COMPETITIVE COST-PER-TON PRODUCTION

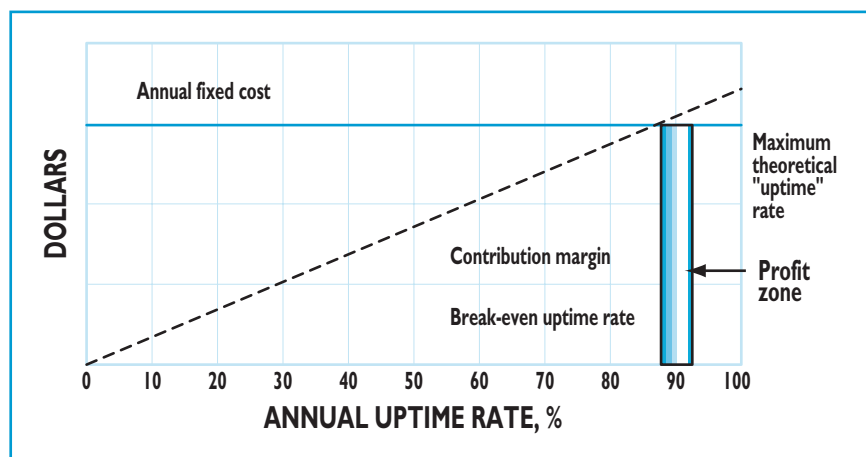
To meet the cost-related demands of the consumer and C&I markets, equipment manufacturers have introduced technology to help mills control furnish, labor, and ancillary costs. One key advancement is the installation of wider tissue machines, which can greatly improve output capacities with only incremental cost increases. For example, a 270-in. machine can produce as much as 35% more than a 200-in. machine. These production gains quickly outweigh the capital expenditure and increased operating costs.

The same holds true for higher-speed machines: the faster the operating speed, the greater production, again with incremental capital cost increases.

In a tight market, new machine installation is not always an economically feasible option. Improving the efficiency of existing equipment, however, can also provide significant benefits for a mill.

EFFICIENCY IN UPTIME FOR MILLS

Another way mills can manage production costs is to maximize uptime by improving machine operating efficiencies. On-site maintenance, repairs, or process consultations can help mills prevent problems before they



1. High uptime rates are needed for mills to make a profit. Each hour of unplanned downtime potentially costs thousands of dollars in contribution margin.

occur. If these added services provide even modest process improvements, mills can improve uptime levels significantly. Using the same labor base, a machine that operates at higher uptime levels can achieve a significant increase in total tons of production per year.

REQUIREMENTS FOR HIGHER BULK AND SOFTNESS

Most issues facing the tissue industry also impact other grades, but in the area of bulk and softness, tissue producers stand alone.

Softness can be defined in a number of ways, including how smooth the sheet feels and the “limpness” of the sheet or how well it drapes. Bulk is strictly a measure of thickness. It can be accomplished in a number of ways. Adding plies to the sheet can increase bulk, but multi-ply production is not as cost efficient as single-ply production. Combining the layers adds a costly step to the process.

As an alternative, one of the most effective methods for increasing bulk and softness is a process called through-air drying. Conventional tissue machines press the sheet onto a Yankee cylinder and dry it by a combination of the steam-heated Yankee cylinder and impingement drying aircaps. In comparison, through-air drying technology removes water by actually pulling high-temperature air through the sheet.

The benefit of through-air drying is a much lower pressing load, helping maintain the thickness of the sheet. Through-air drying also produces higher void volume per unit area—more air around the fibers of the sheet—for greater absorbency. These benefits allow for lower basis weights, which compensate for higher process energy usage.

INCREASED USE OF SECONDARY FIBER

One variable that can keep mills from achieving optimum bulk and softness is furnish quality. If the furnish has higher contaminant levels, the system will have to

work harder in the cleaning process, as well as in the press or calender section, to compensate for profile inconsistencies. Often, it is when recycled or secondary fiber is used that the quality of the furnish comes into question.

Secondary fiber usage is a key issue for several reasons. First, consumers are continuing to demand “green” products, or products made with recycled materials. Additionally, there are cost benefits to running secondary fiber. Problems arise, however, when that fiber is of lower quality.

Lower quality fiber can be defined in several ways. Fiber with higher contaminant levels, including wax and other tacky substances that accumulate to form stickies, is considered lower quality, as is fiber with higher groundwood content.

The effects of lower quality secondary fiber furnish can be widespread across the papermaking process. Problems associated with high contaminant levels in lower quality secondary fibers include:

- Higher dust and dirt levels in the fibers, requiring more intensive cleaning procedures
- Increased drainage problems when stickies conglomerate onto felts and fabrics
- Increased runnability issues, including web breaks and holes, resulting when contaminants “pick out” and weaken the sheet.
- Higher ash content, causing stiffness and brittleness.

To help mills deal with problems related to the use of secondary fiber, and specifically lower quality secondary fiber, equipment manufacturers have developed several processes. The felt cleaning process has been greatly refined for the tissue industry to deal with the effects of stickies accumulation. In addition, special doctor blades have been designed for the former, press, and calender areas to remove residue left by secondary fiber contaminants.

The effects of lower quality secondary fiber can be reflected in higher production costs, runnability problems, and decreased bulk and softness characteristics. It is the responsibility of both tissue producers and suppliers to work together to manage these critical issues. **TJ**

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