PROCESS LAB SAVES STEPS

DANIEL GLOVER AND JAMES FITZHENRY

BUCKMAN'S PROCESS LABORATORY PROVIDES CRITICAL RESEARCH RESULTS AND REDUCES DEVELOPMENT TIME FOR NEW PAPERMAKING ADDITIVES.

BUCKMAN LABORATORIES, A PRIVATELY HELD SPECIALTY-chemical company, recently opened its state-of-the-art process development facility, which is focused on customer-driven research. The new complex, located at the Buckman corporate headquarters in Memphis, TN, is a multi-functional laboratory operation. The structure spans more than 20,000 ft^2 and includes offices for over 30 researchers, an executive conference room, a training area, and laboratory space for all facets of the papermaking process. Included in this laboratory space are areas dedicated to new product formulation, polymer synthesis, water treatment technologies, and an expanded area for papermaking technologies.

Glover prepares M/K Sheetformer for operation.

The purpose of the laboratory is to improve the papermaking process from the pulper to the dry end. Where possible, laboratory-scale versions of mill equipment are used to duplicate real-world conditions. Many new pieces of equipment have been added to aid in process development and reduce the time to introduce new papermaking additives to the market.

Of all the equipment installed, none has been more valuable than the M/K Sheetformer. The automated sheetformer is useful in duplicating the papermaking process using furnishes ranging from thermomechanical pulp (TMP) and pressurized groundwood (PGW) to mixed office waste (MOW) and unbleached softwood kraft (UBK). The sheetformer has three stock tanks. The amount of each stock added to a furnish is computer controlled and may be varied accordingly. For example, the first tank may contain softwood kraft, the second may contain hardwood kraft, and the third tank may contain deinked MOW. The addition ratios of these three stock types can be varied via the computer to create several stock recipes. Multiple chemical additives can also be metered into the papermaking stock, adding to the flexibility of the system. This flexibility has been useful in evaluating the viability of alternative fiber sources for specific customers.

After incorporating the new fiber source into the mill's current furnish and chemical conditions, the effect of this new furnish on paper properties—such as strength, brightness, opacity, or formation—can be determined. For example, a medium manufacturer was interested in making a sized sack grade. Using the sheetformer, Buckman determined what conditions were required to manufacture the desired grade. Using this information, the mill was able to make an informed decision concerning the profitability of this grade.

A second advantage related to the flexibility of computer-controlled chemical additions is that varying levels of chemical additives can be evaluated on any particular furnish. This feature is particularly useful in sizing studies. Dose response curves for multiple levels of alkaline sizes are easily created. Using the mill's furnish and chemical additives, the level of sizing agent needed to achieve the desired Cobb or Hercules size test (HST) value can be found. For example, a customer was interested in con-

verting from one alkaline sizing agent to another. Using the mill's furnish and chemical additives on the sheetformer, the amount of sizing agent needed to yield equivalent Cobb values was determined. With this information, the mill could easily justify a trial with the new sizing agent based on estimated cost and performance.

A final example of the value of the sheetformer involved obtaining improved formation. A customer was interested in improving formation on lightweight grades without sacrificing retention. For this particular lightweight grade, as the first pass retention increased, the formation suffered. The flexibility of the sheetformer permitted testing multiple furnish and wet-end additive combinations. Using the mill's furnish, the best chemistry and furnish combination for improved formation was obtained while maintaining retention. Determining the right combination in the laboratory saved countless hours of mills trials, minimized the risk of problems, and increased the likelihood of success. These laboratory results corresponded well with the mill's paper machine performance.

The laboratory is not limited to these valuable sheetformer experiments. Each workstation produces unique chemistries and testing techniques that are translated into new products for the customer. An additional function of this laboratory is to increase the rate of first-time success of products entering the marketplace. Today's paper companies are less willing to allow a supplier to run multiple trials when securing a chemical application. Delivering the right chemistry the first time is critical. Buckman Laboratories' personnel routinely complete rigorous testing of new products under real-world conditions before they reach the marketplace. This testing helps ensure that products are successful on the machine the first time.

These examples illustrate how a state-of-the-art research and development facility brings value to the papermaking process. In an industry that is reducing research and development expenditures, this expansion plays a critical role in Buckman's research and development position in the marketplace. By working closely with customers on research and development projects, Buckman Laboratories will continue to develop long-term relationships with paper companies. The development of new products and application technologies is always the result of this relationship and collaborative effort. **TJ**

Glover is R&D project manager for Papermaking Technologies and Fitzhenry is a senior development specialist at Buckman Laboratories, 1256 N. McLean Blvd., Memphis, TN 38108-1241.

Paper process laboratory workers in action. Pictured front to back are Rosy Covarrubias, Daniel Glover, James Fitzhenry, and Jeff Derks.