



Institute of Paper Science and Technology

Technology Transfer Fact Sheet

Vortigen™ System Headbox Retrofit

USE 10% LESS FIBER WITH IPST'S NEW VORTIGEN™ SYSTEM

Vortigen™ involves a new concept – and a new design – for the tube section of the paper-machine headbox which more equally orients fibers in all in-plane directions in the paper or board. IPST's new Vortigen™ Technology makes it possible to manufacture paper and board grades with identical strength to what you currently produce, with better uniformity and improved surface properties, using 10% less fiber (see Figure 1).

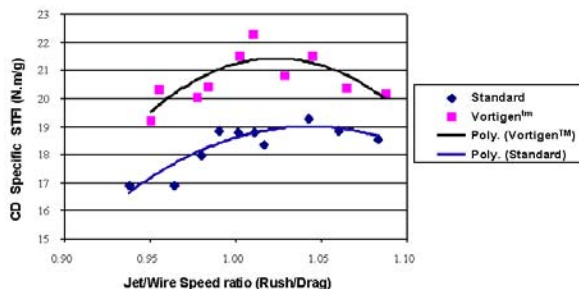


Figure 1. Actual increase in CD specific STFI using Vortigen™ Technology on a linerboard pilot machine.

IPST developed and extensively tested the Vortigen™ System during pilot trials conducted between 1997 and 1999. Recent full-scale commercial trials surpassed expectations. E.J. “Woody” Rice, Vice President of IPST, says, “This technology will rank among the top advances in the papermaking industry over the last 25 years and should continue to be cutting-edge into

the 21st Century. This product offers the pulp and paper industry a ready-now technology that can give a return on investment in less than six months.”

The manufacturing grades with current applications are linerboard and corrugated medium. Potential future extensions are to bleached board and lighter weights such as printing paper and tissue. Lower fiber and energy requirements translate into lower raw-material costs for manufacturers. For example, reducing the basis weight of the linerboard sheet by 10% on a 250,000 tpy, high-performance machine can result in annual savings of over \$5 million in fiber consumption alone (based on a pulp cost of \$200/ton). Increased profitability also results from improved product quality, reduced drying requirements, reduced refining energy demand, reduced water consumption, and increased productivity.

Project Description

The Vortigen™ System is implemented as a retrofit to the headbox of a paper machine. It involves replacement of the existing tube section of the current headbox by a new tube section (see Figure 2). This is an easy retrofit requiring less than 3 hours for certain classes of headboxes. In new headboxes, implementation involves a new design of the tube section.

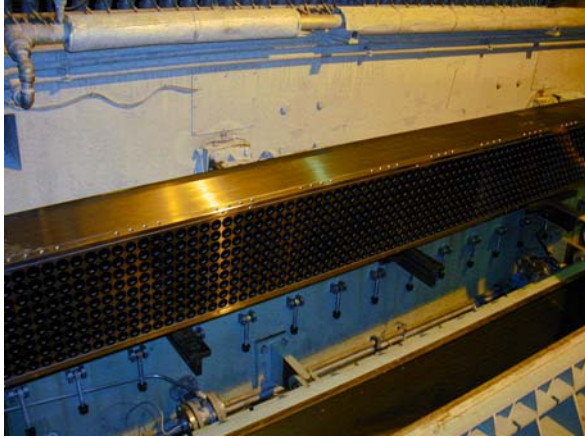


Figure 2. Inserting the Vortigen™ block in a commercial headbox.

The new tube section generates a specific flow pattern inside the headbox which distributes the fibers in a more isotropic form (i.e., more uniform in all directions) in the sheet. This minimizes ‘preferential fiber orientation’ and produces a significantly more isotropic and uniform sheet – a desirable condition long sought by papermakers.

Benefits

- Increased cross-directional (CD) strength (7-25% increase in CD specific STFI), resulting in reduced basis weight for the same performance linerboard and medium.
- Increased dimensional stability.
- Reduced customer problems related to fiber orientation nonuniformity in corrugating operations, e.g., twist warp and sheet curl.
- More flexibility in jet-wire speed differential allowing forming optimization.
- Decoupling of formation and fiber orientation allowing more flexibility in forming operation to achieve better uniformity and formation.

Applications

As a retrofit, the implementation involves replacement of the tube section of the current headbox with the new tube section.

Vortigen™ Technology can be installed directly on a new headbox.

Progress and Milestones

- Highly successful commercial full-scale trial conducted in 2001.
- Vortigen™ is being manufactured by Fluidix Microforming Systems, Inc. housed in the Advanced Technology Development Center at Georgia Institute of Technology in Atlanta, Georgia.

Patents

U.S. Patent No. 5,792,321, entitled “M & A to enhance Paper and Board Forming Qualities”, issued to Aidun on August 11, 1998.

U.S. Patent No. 5,876,564, entitled “M & A to enhance Paper and Board Forming Qualities”, issued to Aidun on March 2, 1999.

U.S. Patent No. 6,153,057, entitled “M & A to enhance Paper and Board Forming Qualities”, issued to Aidun on November 28, 2000.

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