

Stefan H. Winheim

## Silicon Release and Glassine

*Advances in technology demand higher quality limits and manufacturing efficiency*

Traditional papermaking methods for high moisture paper grades such as silicon base, release, and glassine required a multi-step process to prepare the base stock for supercalendering. These steps included manufacturing the paper to a specific moisture average on the paper machine, cutting the paper into smaller rolls and trimming the edges on an off-machine winder, and remoisturizing the paper to a higher average to prepare it for off-machine calendering, and finally supercalendering the product. This multi-step process added significant cost and time to produce the product.

Recent advances in paper finishing technologies in supercalendering and coating allow significant improvements in product quality and uniformity. The market expectations for product quality reflect these advances. To take advantage of these technologies, the quality parameters of the base sheet must meet very specific moisture targets and be very uniform throughout both machine direction and cross direction.

If the product deviates from moisture specifications, roll damage and marking in the supercalender will occur and coating pick-up will be non-uniform requiring down time and lost production that must be made up for.

Because the moisture averages required to meet quality specifications are very high (14 - 20%) release and glassine producers can not take advantage of advanced state-of-the-art on-line calendering technologies. They can, however, implement all but the last step of these technologies by remoisturizing the product on-line to prepare it for introduction into the supercalender. By doing so, the additional steps of off-line remoisturizing traditionally done with rotating brushes and water pans as well as edge slitting and roll cutting can be eliminated resulting in reduced cost to produce the product. New

paper machines have been designed with a remoisturizing section between the last dryer section and the reel. Retrofitting an existing paper machine with this technology presents some interesting challenges. Space must be created on the machine. Edge trimming must be done on the machine.

The reel must allow additional torque to compensate for paper expansion resulting from adding moisture to the sheet. Core chucks and spools must be interchangeable for the supercalender and the paper machine. Moisture gauges must be installed upstream and downstream of the remoisturizing system.

The most critical component is the remoisturizing system. To function correctly it must be able to apply water both to the top and the underside of the sheet. It must have the capacity to add up to 15% moisture to the sheet. The spraying technology must include Particle Size Management (PSM) to ensure uniform spray application and efficient absorption into the sheet. The remoisturizer must have a moisture extraction system to draw off excess over spray and provide a stable sheet run.

A heated hood enclosure must be provided to contain and evaporate moisture-laden air, which can collect and drip from machine components. Control strategies must ensure that a uniform moisture film is applied to both sides of the sheet with controls for both machine direction and cross direction.

The control system must be able to ensure an even, balanced application of water to both sides of the sheet. And most importantly, the system must be functional and available 100% of the time.

The engineering challenges presented to system designers to meet the technical specifications of product application and product reliability are extreme. Construction materials, spray nozzle technology, process control expertise, environmental containment, and papermaking expertise must all be blended together to meet the rigid demands of product application.

Today, advances in paper-machine and paper-finishing technologies make it possible to produce ever more new and enhanced grades of quality paper. It is down to manufacturers to design and supply better technology for actuators and process-control systems. By eliminating steps in the paper-making process that have traditionally been off-line to on-line processes and simultaneously improving quality and efficiency, today's paper manufactures have a better chance in the global market.