

MEETING TODAY'S CHALLENGES IN THE WEB CONVERTING MARKETS

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Oh what challenges we face in today's Web Converting Market! Increasing productivity, lowering manufacturing costs, decreasing scrap rates and shortening production cycles to meet those "we need it yesterday" customer demands. Your customers are faced with the same challenges such as:

- *Increasing Productivity*
- *Lowering Manufacturing Costs*
- *Decreasing Scrap*
- *Shortening Production Cycles*

To help meet those challenges, customers are requesting larger diameter rolls of high quality materials without giving up the demand that these larger diameter rolls still be wound on 3" (76mm) I. D. cores.

If this sounds familiar, then let's address ways that these challenges can be met. The best ways to *increase productivity* and *lower manufacturing costs* is to eliminate non-value added activities. Another way to *lower production costs* and *decrease scrap* is to quickly identify process problems so corrective action can take place sooner. Also, to *decrease scrap* and *shorten production cycles*, the number of times the material is handled needs to be minimized.

One of the best ways to accomplish these goals is to slit and wind shippable quality rolls on the production process line. By eliminating the slitting and rewinding operation, between \$0.05 and \$0.10 per pound of production cost may be saved. By slitting and winding high quality rolls with proper density control on your process, production quality deviations such as moisture or caliper which produce basis weight variations across the sheet, are more easily identified and corrected.

Each time a roll of material is handled, the chance of roll damage is increased. Typically, when a roll is loaded into the unwind of a slitting and rewinding operation, multiple layers of the outside diameter are removed. The sheet is then threaded through the machine and jogged until the sheet runs true. After that, the slitters are engaged and the slit webs brought to the new cores. All this generates waste and lost product. Next, the web is unwound, tensioned or stretched, possibly scratched on idlers not rotating at web speed and rewound at varying tensions during acceleration and deceleration times. Typically, tension variations during speed changes are +/- 10% of the tension set point. All of these possibilities of generating waste or defective products are eliminated by producing the slit and wound rolls directly on the process.

The industry trends for higher line speed and wider webs that need to be slit into narrower widths has been a major challenge in moving the production of finished quality, slit rolls onto the production line. In the past, in-line slitting and rewinding high quality shippable rolls has been restricted due to the following:

1. **Consistent quality on the process:** For an in-line slitting operation, the process quality must be consistent. Cutting off-quality production out of twelve slit rolls instead of one parent roll can really drive up production costs. Today, with the process control systems on most production lines, these consistency problems have been eliminated.
2. **Changeover time for slit width changes and for roll removal and shaft recoring:** Now with automated slitter positioning systems and automated roll and shaft handling systems, fast and efficient set width changes, roll changes and recoring are possible.
3. **High quality, high-speed transfers and achieving good starts on new cores with 100% consistency:** New transfer systems produce straight-line cuts and transfers the slit web directly to the new cores. Stationary knife transfer concepts provide 100% roll change consistency regardless of web width or speed of the operation. These provide the important clean web starts on the new cores.
4. **Scrap generation during the roll change operation:** Good quality rolls require that the first and last wraps are as good as those in-between. Controlled tension, nip and torque must be maintained throughout the entire winding cycle, including the roll change.

Small diameter roll winders can produce very fast roll change cycles. These winders such as Black Clawson's stationary knife Black Magic™ winders produce roll changes in as little as 1.2 seconds. In-line slit rolls off these ultra-fast roll changing winders have only the last few wraps with neckdown and wrinkles. These are shipped with the roll as protective wraps and leaders for threading.

Large diameter roll winders can reduce or eliminate roll change scrap by:

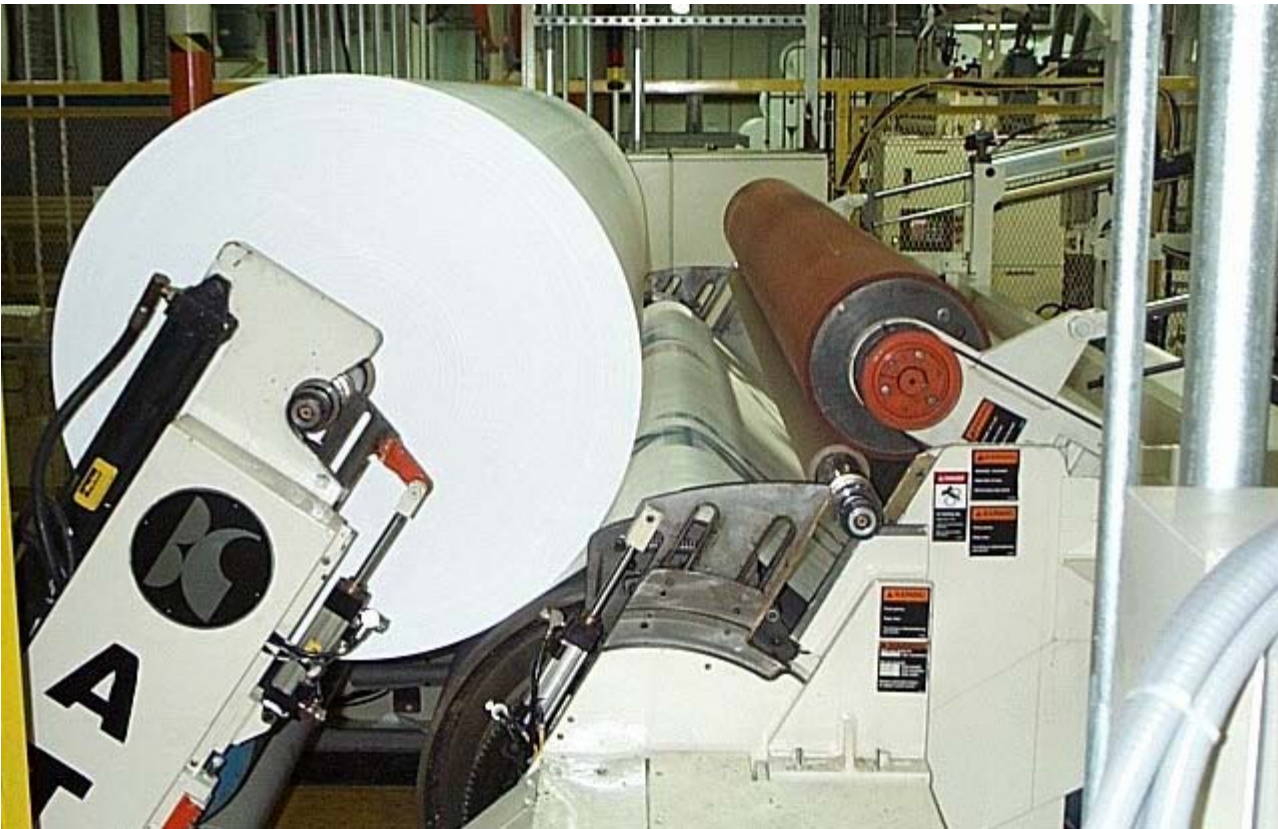
- A continuous layon roll that follows the indexing winding rolls at the point the web enters individually slit rolls. This technology is incorporated into Black Clawson's patented Super "T"™ and the newly patented TriStar™ continuous pressure roll winders.
- Independent servo indexing arms bring the new cores into close proximity to the winding rolls and quickly indexes both together to make a transfer. This technology is incorporated into Black Clawson's patented Robotic™ winders.
- Winding on a drum type winder when the transfer is made between the nip of the new cores and the winding slit rolls with a stationary knife type transfer system. This technology is incorporated into Black Clawson's patented stationary knife surface transfer system on SurfaStart™ winders.

The only obstacle in achieving increased productivity, lowering manufacturing costs, decreasing scrap rates and shortening production cycles has been the problems associated with winding large diameter rolls on production width machines in a continuous operation on those “customer required” small diameter cores.

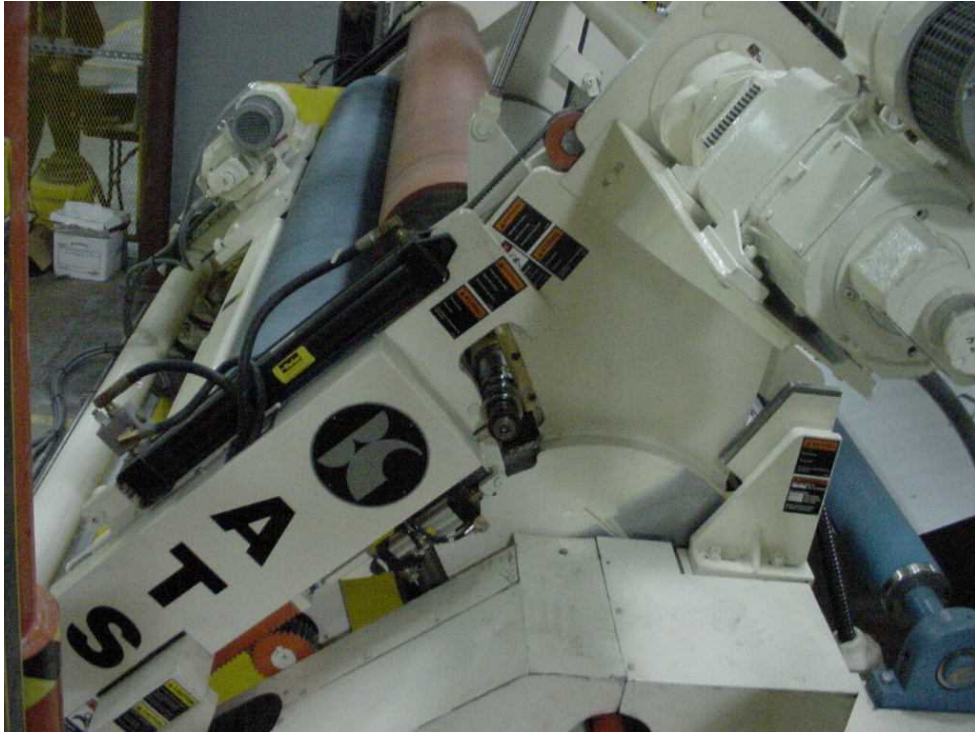
A newly developed winder has been introduced by Black Clawson which overcomes these remaining challenges. The *Advanced Technology SurfaStart™ (ATS) winder* eliminates the shaft critical speed and deflection challenges that are posed by in-line slitting and winding large diameter rolls on core inside diameters as small as 3” (77 mm). The ATS winder winds materials that can be surface wound, such as films, non-wovens, papers, paperboards, and composites. These materials can be wound up to 62” (1.55 meters) in diameter at production widths of up to 220” (5.5 meters) and speeds up to 2500 fpm (750 mpm) on 4” (100 mm) O. D. cores or 4000 fpm (120 meters per minute) on 7” (175 mm) O. D. cores. The patented shaft and roll support systems of the ATS winder eliminate the shaft critical speed and deflection problems when winding these large diameter, slit rolls on small diameter cores.

In conclusion, meeting today's Converting Market Challenges of *increased productivity, lowering production cost, decreasing scrap rates and shortening production cycles* means doing away with non-value added activities and scrap and/or defect generating processes. Meeting your customer's challenges of building large diameter rolls on small diameter cores requires incorporating the latest winding technology into your process line. Even using \$0.05 per pound for the cost of your rewinding operation makes the payback for a new winder on your line very attractive.

BLACK CLAWSON'S NEW PATENT ATS WINDING SYSTEM



**The New Patented Black Clawson ATS Winder enables
Continuous High. Speed Slitting and Winding
Large Diameter Rolls on 3" (76mm) Cores**



Front View of ATS Winder



Back View of ATS Winder

Listed Below are the Unique Features of the New ATS Winder:

- Winding slit rolls on wide machines in a continuous operation, shaft critical speed and deflection are major problems. The shaft and roll support systems of the ATS eliminate these problems.
- The driven primary arm nip roll “sandwiches” the new cored shaft between the main drum and nip roll at roll change eliminating the natural deflection which causes wrinkling at the start and causes critical speed problems.
- The transfer shoe system with pop-up knife assures a straight, clean transfer regardless of web speed.
- The driven primary arm nip roll assures a good hard start and proper hardness profiling thru the programmed nip and programmed torque control as a function of the winding roll’s diameter.
- The 11 o’clock roll change position and 1 o’clock winding position on the main winding drum provides excellent core and winding roll support.
- The slow and controlled movement of the winding roll set from roll change position to winding position provides very little web length change to assure winding straight sided rolls.
- The driven support drum supports the winding roll set in the winding position to minimize the winding roll’s deflection.
- The driven support drum assures winding rolls with proper density profile thru the programming of the nip pressure and the torque control of the drive.
- The driven support drum is also used to stop the wound set after transfer.
- Shaft sensing devices is incorporated into the support arm to prevent excessive loading by the support drum causing the lifting of the winding roll set.
- The support arm is used for safety to insure the winding roll set in contained inside the two winding drums. It is also used to prevent lateral movement of the winding roll set and to eject the finished roll set.
- The ATS incorporates automatic shaft handling into its design to assure continuous high productivity.
- Dual bowed spreader rolls assure positive slit with separation.
- The Separate Slitter Station provides the flexibility to supply various types tension isolation systems and slitting systems to best meet the specific application.
- The ATS is of mill duty construction for the productivity of 24 hours a day, seven days a week and 350 days a year operation.