System 8000

Automatic center guiding, spreading, and width control for fabric calender lines.

Simplicity Through Engineered Solutions

System 8000 is a cost effective solution for guiding, spreading, and width control for fabric calender trains. The solution upgrades legacy components to a modernized platform consisting of non-contact sensors; electro-mechanical, ball screw type, DC-motor actuators; pulse-width modulated DC drives; and Allen-Bradley’s Control Logix controllers, PanelView™ Plus graphic terminal, and Ethernet/IP fieldbus communication. Practically, the system offers standard equipment, time-tested and proven reliability, and application robustness – cost effectively. Operationally, System 8000 offers the simplicity of SimPlex controls, a standard sensor for all applications throughout the line, and an integrated spreading control scheme to ensure optimal width control for all fabric materials, weaves, and densities.

We Can Deliver:

- Increased throughput - Consistently maintained specified width.
- Reduced downtime - Replace hydraulics with DC servo controlled electro-mechanical actuators.
- Improved product quality - Better cord distribution uniformity and reduced edge cord deviation.
- Reduced waste - Decreased scrap at splices and execute changeovers faster.
- Decreased variation - Automated fabric spreading and width control.
- Simplify operations - Spreader controls centralized and user-friendly interface.
System 8000 - Fabric Width Control

General Overview

Fives North American’s technical advancements allow tire-producing plants to automate the fabric center-guiding systems, fabric spreading systems, and edge trimming systems on calender trains to maximize throughput and product uniformity. Our Total Concept fabric control systems feature:

- **First Edge Non-contact Detectors** specifically designed to sense low end count fabric (8 EPI) and provide an accurate material edge position.

- **Adjusta-Guide®** fabric center-guiding systems (steering type) for 500 pounds (227 kg) to 5000 pounds (2272 kg) tension zones. Designed for center-guiding fabric in the pre-calender section of the calender train.

- **SimPlex™** controls for center guides offer simplicity, straightforward operation, and plug-and-play installation.

- **Cam-Track™** displacement center-guiding systems (displacement type) for 500 pounds (227 kg) to 5000 pounds (2272 kg) tension zones. Designed for minimum stress redistribution of the calendered fabric in the post-calender section of the calender train.

- **SpreadMaster** dual double axle, bowed roll tire cord spreading systems for low tension and high tension applications. The bowed rolls are constructed with universal joints at their center, so that each half operates independently with 1,000 pound (454 Kg) thrust H5530H actuators.

- **Patented ZERO-RESET™** control technology offers superior spreading stability, optimal width performance, and an industry standard platform for reliability. ZERO-RESET technology compensates for the variable transport lag (hunting action) to achieve stable and accurate (1/16” [1.5 mm]) width control for the tire cord fabric.

- **SimPlex™** electro/mechanical high speed dynamic positioning systems for calender trimming on 4-roll or tandem 3-roll calender trains. The system includes sensor electronic offset and digital readout of the dimension of rubber from the last fabric cord on each fabric edge.

PRE-CALENDER SYSTEMS

1. ③ Replace existing fixed, single bowed roll with low tension SpreadMaster (4.5” diameter) tire cord spreading system with ZERO-RESET control and programmable detector positioning for initial fabric spreading into the entry accumulator or prior to heat drying section.

2. ④ ⑤ Replace existing fixed, single bowed roll with low tension SpreadMaster (4.5” diameter) tire cord spreading system with ZERO-RESET control and programmable detector positioning for initial fabric spreading into the entry accumulator or prior to heat drying section.
System 8000 - Fabric Width Control

2-roll high tension Adjusta-Guide with SimPlex center guide control system to assure that tire cord fabric is on machine center line prior to the preliminary and final high tension Spread-Master system before the calender. Non-contact line scan H3662 sensors provided in ready-to-install O-frame mount.

CALENDER SYSTEM

To achieve maximum width control and optimal product quality, a coordinated set of equipment is provided in the high tension calender zone. The system features shrink-down compensation by continuously monitoring the calendered fabric width at the exit of the cooling drums and adjusting fabric width prior to the calender. The system includes:

1. Preliminary Spread Master
2. Final Spread Master with first-edge non-contact H3662 sensors on motorized positioner with ZERO-RESET™ control technology. Includes dedicated Allen-Bradley ControLogix PLC with Panel View Plus 12” color touch screen graphical interface and EtherNet/IP communication
3. Independent edge, three-finger spreader using first-edge non-contact H3662 sensors with ZERO-RESET control technology to ensure edge cord count distribution.
4. Non-contact line scan H3662 width measurement system located after the cooling drums.
5. H5550 dual, independent electro-mechanical positioning system with SimPlex controls for customer trim knives.

POST-CALENDER SYSTEMS

6. Cam-Track displacement guide system for center-guiding calendered fabric prior to the exit accumulator and prior to wind-up. SimPlex controls and non-contact H3662 sensors in O-frame mount included. The displacement guide system center-guides calendered fabric with a minimum of stress redistribution.
7. Pre-windup width monitor via non-contact H3662 sensors in O-frame mount. Width measurement displayed at main operator interface and available via fieldbus communication.
8. Non-contact H3662 sensors with SimPlex control for liner let-off stands. Edge guide or center guide method provides smooth and accurate placement of "shop worn" liner material.
System 8000 - Fabric Width Control

System 8000 Features

- Wide field of view digital sensors provide stable spreading control for multiple fabric densities with optimal speed of correction.
- Total integration of spreading electro-mechanical devices through the dedicated controller provides the highest performance and width compensation control.
- Ability to enter and store product codes to facilitate rapid change-overs with minimal operator involvement.
- Out-of-spec material at splices and order changes is minimized with automatic return to memory position.
- Graphical touchscreen interface with alarms and status provides system feedback to the operator and assures consistent quality product.
- Final calendered product width information available for download to customer’s quality control system.
- SimPlex controls for center guides offer plug-and-play simplicity, one-touch configuration, and straight forward operation.
- Electro-mechanical actuators for maximum reliability and minimal maintenance.
- Mechanical components designed for simple field installation and maintenance.

Control System

System 8000 integrates the spreading and width measurement electro-mechanical equipment into an interactive control scheme managed by a dedicated controller. Utilizing ZERO-RESET technology to achieve stable and accurate performance, the system assures correct calendered width, minimizes waste at splices and order changes, provides uniform quality material, and optimal wind-up width - all with minimal operator involvement and an intuitive, user-friendly interface. The multiple HMI screens encapsulate years of user feedback and application experience to offer a logical and practical flow of information and feedback. An EtherNet/IP fieldbus option enables download of product specifications and real time feedback on width data and system status.

Professional Services

Fives North American recognizes the significant capital expenditure necessary to modernize a fabric calender train. We typically include a broad array of professional services to ensure our clients achieve the highest return on their investment.

- On-site Calender Train Process Assessment
- On-site Project Engineering Kickoff
- Project Management
- Controls Engineering
- Mechanical Engineering
- Installation Supervision
- System Commissioning and Start-Up
- Operator Training
- Maintenance and Engineering Training
- System Documentation

Simplicity Through Engineered Solutions

Fives North American Combustion, Inc.
Guiding Systems
4455 East 71st Street - Cleveland, OH 44105 USA
Tel: 216.271.6000 - Fax: 216.641.7852 - email: fna.guiding@fivesgroup.com - www.fivesna.com