The tire and rubber industry today consists of global competition and large scale integrated operations in every aspect of the materials required to produce the final products. The need to be highly productive and cost effective makes it necessary to continuously evaluate and adjust the competitive edge of a company. Many tire production facilities were built a quarter of a century ago. However, chronological age and calender line sophistication are two different categories. Over the years, managers of tire producing plants have sought technical advancements to maximize quality, throughput, and machine utilization. The calender train is considered "state-of-the-art" when all technological evolution has been incorporated.

“The business of building tires isn’t expected to get any easier as the industry heads towards the twenty-first century. Tire makers anticipate they will face more pressure—from customers and competition—to build better tires without sacrificing some performance characteristics to improve others.”

"TOTAL CONCEPT" Fabric Control Systems

Fives North American's technical advancements allow plants to now consider automation of the fabric center-guiding systems, fabric spreading systems, and trimming systems on calender trains to maximize the uniform quality characteristics. Our TOTAL CONCEPT fabric control systems feature:

- **Discriminating Center-Guide Detectors** specifically designed for viewing tire cord fabric and calender fabric to provide reliable centerline positioning of the tire cord wire fabric.

- **Discriminating Edge Detectors** specifically designed to sense even low end count fabric (8 EPI) and provide an accurate proportional output.

- **SpreadMaster®** tire cord spreading systems for low tension and high tension applications feature patented ZERO-RESET technology that 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.

- **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.

- **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.

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

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1. Adjusta-Guide 2-roll center-guiding system to assure that tire cord fabric enters the SpreadMaster and entry accumulator on machine centerline.

2. Adjusta-Guide 2-roll center-guiding system to locate tire cord fabric to machine centerline at the exit end of the entry accumulator and prior to our SpreadMaster.

3. SpreadMaster (4.5" diameter) low tension tire cord spreading system with PLC ZERO-RESET control and programmable detector positioning for initial fabric spreading into the entry accumulator.

4. SpreadMaster (4.5" diameter) low tension tire cord spreading system with PLC ZERO-RESET control and programmable detector positioning for accurate spreading and tire cord distribution prior to the heat drying section.

5. SpreadMaster (4.5" diameter) low tension tire cord spreading system with PLC ZERO-RESET control and programmable detector positioning for accurate fabric width control and tire cord distribution through the heat drying section.
6 Adjusta-Guide 2- or 3-roll, high tension, center-guiding system to assure that the fabric is on machine centerline prior to the preliminary and final high tension Spread-Master system prior to the calender.

9 AccuTrac high speed electro-mechanical positioning system using the AccuSet Pulse Width Modulated (PWM) controller for customer trim knives or the wire-thru method. The wire-thru method (thru the calender) for high accuracy trimming is recommended.

**POST-CALENDER**

10 Cam-Track displacement guide system for center-guiding calendered fabric prior to the exit accumulator. The displacement guide system centers-guides calendered fabric with a minimum of stress re-distribution.

11 Cam-Track displacement guide system for center-guiding calendered fabric prior to wind-up.

12 Dual discriminating center-guide control for liner let-off stands. The center-guide method provides smooth and accurate placement of "shop-worn" liner material.

**LOCATION**

7 System 7000 for preliminary and final fabric spreading in the high tension calender zone. The system also features shrink-down compensation by continuously monitoring the calendered fabric width at the exit of the cooling drums. It also adjusts the target width of spreading at the calender to achieve the desired width at the wind-up for increased yield. The system includes:

- Dedicated programmable logic controller (Allen-Bradley or Siemens)
- Preliminary SpreadMaster
- Final SpreadMaster
- Digital Sensing System for width measurement located at the cooling drums
- Color "Touchscreen" interface