



Maximize production throughput and efficiency, decrease costs and increase sustainability

Tire manufacturing

Proven automation solutions and local expertise to help you overcome your toughest challenges.





Unexpected machinery downtime increases your operational costs and severely affects your ability to meet production targets.

Challenged to guarantee throughput, reduce operating costs and achieve greater sustainability?

Competition within the global tire market has never been fiercer, requiring continued product innovation, improved production efficiency, more sustainable tire designs and reductions in energy consumption and scrappage. Where plants have been consolidated to streamline production, a reduction in throughput cannot be tolerated. However, increases to production puts greater stress on equipment, which leads to failures, downtime and affects your ability to meet targets.

“A capital-intensive, labor-intensive tire factory needs to operate above 95% of capacity if it is to make money.”

– David Shaw, CEO-Tire Industry Research



“Production expenses have the greatest bearing on cost in the tire industry, at around 70% of revenues.”

– Telesivory Benchmarking, 2017



“Tire manufacturers recognize they play a role in reducing greenhouse gas emissions, both by reducing manufacturing related emissions and by designing tires with greater rolling efficiency.”

– USTMA Sustainability Report, 2018



Boost throughput, cut downtime and reduce energy consumption throughout the tire-making process

Machinery and processes for tire manufacturing need to provide improvements in throughput, quality and sustainability. By implementing Emerson's automation and control solutions, production efficiency and availability can be increased through greater equipment performance and reliability. Our solutions will help identify areas of underperformance and waste, helping you to lower operational costs and achieve your sustainability targets.



Increase operational efficiency to meet your production targets

- Identify underperforming equipment and processes
- Prevent unexpected failure affecting production
- Extend periods between maintenance

“Emerson’s modular solutions are enabling us to make changes to the assembly and tire building process easily. This means we can minimize downtime and restart production quicker, with significant financial benefits.”
– Leading tire manufacturer, France



Lower your manufacturing costs to ensure you remain competitive

- Increase the efficiency of operations through greater automation
- Reduce overall maintenance costs
- Install more machinery in a smaller footprint
- Prevent costly late stage scrappage

“Downtime caused by a malfunctioning third-party electronic input module was costing us money. With no spare available onsite, Emerson assembled and delivered replacement modules enabling production to restart within six hours.”
– Global tire manufacturer



Meet your sustainability targets

- Reduce energy consumption and waste
- Lower consumption of utilities
- Minimize scrappage and material waste

“Reducing energy consumption is critical to our sustainability and cost efficiency goals. Using Emerson’s solution we can continuously monitor compressed air to detect leaks and optimize consumption, helping to lower energy use.”
– Tire manufacturer, Asia

With Emerson, you can overcome your tire manufacturing challenges



Mixing equipment

Improve consistent quality of materials through automation and precise process control. [Fluid Control](#) ▶ p10

Fabric/wire calendars and extruder

- Increase reliability and material guidance precision of bead wiring and rubber coating. [Motion](#) ▶ p12
- Improve pneumatic system performance to avoid premature valve failures. [Air Preparation](#) ▶ p13

Tire building machine

- Increase reliability and repeatability of your directional control. [Pneumatic](#) ▶ p12
- Monitor compressed air pneumatic system to reduce energy consumption. [Sustainability](#) ▶ p6
- Increase visibility into health of pneumatic valves to reduce maintenance costs. [Productivity](#) ▶ p9
- Use proportional valves to control the inflation of the green tire. [Proportional](#) ▶ p10

Tire Cutting

- Ensuring quality, reduced waste and energy consumption and maximizing production throughput. [Cutting](#) ▶ p7

Finishing process

- Ensure precise linear motion and positional accuracy of transfers on uniformity machine. [Motion](#) ▶ p12
- Increase test equipment machinery reliability using robust pneumatic actuators. [Productivity](#) ▶ p19

Curing press

- Tighter control of steam used to heat the mold and bladder pressure. [Fluid Control](#) ▶ p10
- Increase process uptime through extended life of steam control valves. [Productivity](#) ▶ p9
- Improve pneumatic system performance to avoid premature valve failures. [Sustainability](#) ▶ p13
- Improve steam management, avoid losses and reduce wasted energy. [Sustainability](#) ▶ p13



Sustainability and energy efficiency

Measurement, analytics software and Edge computing technology provides enhanced insight to emissions, water, steam, compressed air and energy usage to support greater sustainability. Identify pneumatics system leaks and steam trap failures to prevent wasted energy and ensure steam quality management. Learn more. ► [p6](#)

Productivity and cost efficiency

Pneumatic valve and cylinder health monitoring solutions support predictive maintenance strategies for reduced downtime, enhanced throughput and improved overall equipment effectiveness. Compact automation solutions reduce machinery footprints, with robust and reliable steam valves preventing machine failures that produce costly late stage scrappage. Learn more. ► [p8](#)

Steam and fluid control

Durable pressure operated valves provide reliable control in challenging applications such as the mixing area and curing press. Flow control devices offering long, reliable lives and easy maintenance help you maximize production uptime and throughput. Learn more. ► [p10](#)

Pneumatic directional and linear motion control

Repeatable, high precision linear and directional pneumatic control ensures your production meets the highest quality specifications. Robust cylinders and actuators combined with modular valve systems and air preparation technology provide application flexibility, reduce costs, simplify commissioning and maximize availability of tire building machinery. Learn more. ► [p12](#)

Sustainability and energy efficiency

Central to any sustainability strategy is the desire to increase energy efficiency and minimize water and compressed air consumption, machinery failures and product waste. To achieve these targets, Emerson provides solutions that support collection, analysis and visualization of data relating to machine performance and energy consumption. Innovative sensor technologies gather continuous, real-time data and diagnostic information from valves and pneumatic system components, pumps and steam traps. Advanced industrial analytics applications provide actionable insights, enabling better, faster decisions to digitally transform your operations.



What's your opportunity?

- Easy-to-implement and scalable analytic solutions can help increase energy efficiency and sustainability at your plant.
- Continuous monitoring of the most critical steam traps enables immediate failure detection, improvement in steam management and reduction in steam waste.



Collect and analyze pneumatic system data to detect costly leaks. Connect with an Emerson expert.

Compressed air can account for as much as 30% of total energy consumption in tire production. Continuously monitoring and analyzing compressed air pressure, flow and consumption data, enables improve machinery performance, optimize air consumption and detect leakage in real-time. Emerson experts can help.



Services offered...

- Global automation technology and industry expertise available locally
- Digital Transformation introductory sessions
- Connected Services to remotely monitor equipment

Featured products to improve sustainability and energy efficiency

Compressed air monitoring



AVENTICS Series AF2 flow sensor monitors air consumption in pneumatics systems, enabling rapid intervention in the event of leakage.

- Supports optimization of energy consumption, reducing CO₂ footprint
- Prevents machine downtime and lowers operational costs
- Continuous monitoring enables compliance with DIN ISO 50001 Energy Management standard
- IIoT-enabled sensor with web-based dashboard provides real-time data to users

Steam trap monitoring



Rosemount 708 Wireless Acoustic Transmitter provides enhanced insight into condition and status of critical steam traps, enabling immediate failure detection and swift repair to prevent wasted steam and energy.

- Reduces steam waste, increases energy efficiency and operating efficiency of steam system
- Ensures steam traps are performing correctly and prevents failures going unnoticed for long periods
- Easy installation and integration into existing *WirelessHART* network

Tire cutting



Branson™ ultrasonic technology provides exceptionally precise, reliable and repeatable rubber cutting ensuring product quality, reduced waste and maximizing production throughput.

- Very high precision cutting creates smooth, clear and cleans cuts
- Blade output is monitored in closed loop electrical circuit to provide consistent repeatable cutting
- Vibrating cutting horn only activated when cutting for reduced energy consumption

Steam monitoring



ASCO Series 298 pressure operated valves with position detection enable you to monitor opening and closing times of the valve to ensure the steam temperature and pressure is correct during the curing process.

- Alert provides with variation outside the normal range helping to prevent excessive steam loss
- Rugged valve, built to withstand steam, superheated water and corrosive fluids making it ideal for curing press applications
- Ideal for use with steam: max fluid temperature of 250°C (482°F)



For more information, visit [Emerson.com/tires](https://www.emerson.com/tires)

Productivity and cost efficiency

To increase productivity and drive profitability there must be greater emphasis on production, reliability and quality. Machinery must have a smaller footprint and by increasing reliability this improves throughput, lowers maintenance costs and ensures quality. Emerson can help you to identify and analyze problem areas and key metrics, before designing and implementing solutions that provide desired outcomes. Our compact robust fluid and motion control technology enhances the reliability of machines, while industrial analytics applications provide actionable insights into equipment performance and health, helping to support operational improvements.



What's your opportunity?

- Monitoring cylinder response and cycle time enables operators to detect changes prior to a failure, helping to prevent unplanned downtime and late stage scrappage.
- Prevent underperforming machinery and unexpected failures causing costly late-stage product scrappage



Ensure pneumatic systems do not impact throughput and quality. Connect with an Emerson expert.

Pneumatic valve and cylinder wear can result in decreased cycle times, unscheduled downtime and even tire quality issues. Allow Emerson experts to advise you how to continuous real-time analysis can allow your maintenance teams to infer device condition, so that failures can be avoided.



Services offered...

- Digital Transformation workshops to identify improvement opportunities
- Reliability consulting to develop plant improvement plans

Featured solutions to improve productivity and cost efficiency

Valve and cylinder condition monitoring



AVENTICS Series G3 and AES valve systems enable continuous real-time analysis of valve and cylinder cycles and travel distance, which allows maintenance teams to infer device condition and avoid failures.

- Proactive replacement of pneumatic devices prevents decrease in cycle times, reduces unplanned downtime and improves overall throughput
- Visual indicators notify maintenance personnel when a part should be checked and predict its remaining lifecycle
- Integrated graphic display on valve system for easy fault localization
- Safeguards materials and prevents energy being wasted on late-stage product scrapage

Cylinders, actuators and valves



Robust and reliable industry-proven cylinders, actuators and valves have extended lifecycles helping increase machinery uptime, lower maintenance costs and prevent any reduction in performance that may affect tire quality.

- Robust cylinders and actuators with long lifecycles extend period between maintenance
- Reliable steam valves suitable for the most demanding applications

Steam valve monitoring



Emerson's software solutions provide steam valve lifecycle monitoring, with analytics designed to predict failures before they occur. This supports predictive maintenance strategies, alerting maintenance as to when valves need to be replaced preventing underperforming curing that creates costly late stage tire scrapage and lost production.

- Reliable curing press performance
- Reduction in costly late stage scrapage and improved sustainability
- Increase machine availability by improving overall steam quality

Data collection and analysis



Emerson's PACSystems™ RX3i CPL410 Controller with integrated edge computing capability enables real-time data collection, analysis and factory floor level visualization for informed decision-making by machine operators.

- Data collected from across the tire manufacturing process can be analyzed and presented to operators directly at the machine via industrial displays
- Integrated edge computing capability, helps minimize devices required reducing equipment footprint



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Steam and fluid flow control

Flow control devices, such as pressure operated valves, play an essential role in optimizing the mixing process and ensuring efficient operation of the curing press. Emerson's pressure operated valves are designed to function in demanding steam applications and provide reliable and precise control to ensure the curing press operates efficiently. This helps to minimize energy usage and reduce operating costs. The mixing process requires tight control of ingredients and process temperatures. Using Emerson pressure operated valves you can ensure tire materials meet your exact quality standards.



What's your opportunity?

- Reduce energy use by controlling steam with greater precision, helping to lower operational costs
- Reduce your total cost of ownership and maximize uptime by specifying valves offering long, reliable lives and easy maintenance



Correct valve selection and sizing to meet application demands.

Almost every application is different. It is important to specify the correct valve type, size and performance capability. Emerson experts can provide appropriate advice to ensure your application operates correctly helping you achieve on-time start-up.



Services offered...

- Global customer service available to discuss your application and appropriate valve solutions
- Local language support and advice
- Pressure operated valve repair services

Featured steam and fluid control solutions

ASCO Series 298 pressure operated valves



Rugged 2-way fluid pressure operated valve, built to withstand steam, superheated water and corrosive fluids making it ideal for curing press applications.

- Superior durability and longevity
- High performance, maintenance free and resistance to shock and vibration (5G)
- Anti-water hammer design
- Ideal for use with steam: max fluid temperature of 250°C (482°F)
- Proportional versions available
- Fully engineered, ready to install integrated solutions can be produced

ASCO Series 287 solenoid valves



Coaxial-type solenoid valves designed for high flow rates and low pressure loss. Compatible with viscous or abrasive gases and liquids in high-pressure applications.

- Suitable for bladder control management
- Robust construction designed for long service life
- Backpressure safe construction

ASCO proportional valves



Our wide range of proportional valves with digital control provide precisely tuned, cost-effective compressed air pressure to the tire plant.

- Field programmable on the tire line providing application flexibility
- Closed loop pressure control maximizes production processes
- Valve control loop parameters can be optimized for specific applications
- IO-Link communications
- Low power consumption, small footprints and long service lives

ASCO Series 290 angle seat valves



2-way direct acting valve designed for demanding applications involving aggressive and high temperature liquids, gases and steam.

- High flow, extremely durable and easy maintenance
- Provides variable flow proportional to the control signal
- Fail close construction. Closes upon loss of power enhancing safety
- Position feedback to help optimize flow



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Pneumatic directional and linear motion control

Pneumatic directional control valves are critical to the safe, efficient and precise operation of your wire and fabric calendars, extruders, tire building machines, curing presses and finishing process. Emerson's robust and reliable valves and digital communications ensure machinery remains online 24/7, helping you to achieve throughput targets. Emerson's pneumatic cylinders and actuators provide precise and reliable motion control and positional accuracy reducing machinery downtime and maximizing throughput. Air preparation using Emerson's filter, regulator and lubrication solutions ensures that machinery operates correctly, maintenance is reduced, and throughput is maximized.



What's your opportunity?



- Cost-effectively network your valves to your control system using a choice of industrial communication protocols
- Quickly and safely replace a failed valve without the need to shut down complete machines or processes
- Greatly increase the lifespan of valves by purifying compressed air and regulating pressure

Save time and cost, reduce overall footprint. Preassembled valve systems.



Complete preassembled, certified and ready-to-install pneumatic valve solutions can ensure your production start-up date is unaffected by any time and resource constraints. Emerson's experienced design engineers can help.



Services offered...

- Intuitive online product configurator tool simplifies the design of valve systems
- Easy access to downloadable CAD files
- Quick shipping of components to meet tight commissioning schedules
- Technology and application support delivered by experienced global representatives
- Rapid product repair and replacement service

Featured pneumatic solutions

AVENTICS Series 500 and AV03/AV05 pneumatic valve systems



Compact modular valve manifolds that provide flexible and precise directional control from a vast array of valves for every application.

- Choice of electronics platforms that provide digital connectivity and diagnostic capability
- Flexible modular system with innovative clip design allowing easy module removal and replacement
- Valve systems designed to ISO 5599 and 15407 standards
- 24V DC and air pilot zoning for machine safety integration
- Interfaces to a broad range of valves

AVENTICS Series G3, 580 and AES fieldbus electronics platforms



Fieldbus electronics and I/O platforms that create highly distributed valve solutions that help reduce total cost of ownership.

- Unique graphic display provides diagnostic and status information for faster maintenance and commissioning
- Auto recovery module protects configuration during a critical failure
- IIoT capability
- Connectivity using a range of industrial communication protocols

AVENTICS ISO cylinders



Robust and extremely durable pneumatic actuators and cylinders that provide linear or straight-line motion and force to your specific design requirements.

- Widest range of cylinders, many designed to CNOMO and ISO standards, including ISO 6431, ISO 6432, ISO 21287 and ISO 15552
- Extremely robust and durable devices that provide extended lifespans
- Suitable for systems of up to 17bar (250psi)

AVENTICS NFPA cylinders



Interchangeable air and hydraulic cylinders designed to excel in the most demanding industrial applications.

- Maximum flexibility with over 20 mounting styles
- Adjustable cushions and long bushing for superior performance
- Adaptable for use with position sensors and rod locks

AVENTICS modular air preparation units



Modular filter, regulator and lubrication device that prepares and regulates compressed air to ensure optimum performance of pneumatic systems.

- Compact, modular packages
- Available in port sizes 1/8"–1"
- Shut-off isolation valve for safety applications
- Lower pressure drop delivers energy savings
- Available with integrated IIoT-ready sensor to monitor air consumption in pneumatic systems, optimizing energy consumption, preventing machine downtime and reducing costs



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Reduce time, cost and risk with Emerson's integrated solutions

When timelines are short and resources at a premium, this can increase the risk of a project being delivered late and over budget. To meet this challenge, Emerson can design, build, test, certify and install your fluid automation technology and systems. Preassembled, ready-to-install integrated assemblies, panels and enclosures, specifically built to your specification help lower the risk of design amends during the production phase, reduce equipment footprints, simplify integration with other systems and offer reductions in assembly, R&D and procurement costs.



Integrated assemblies

- Pneumatic cylinder, air preparation and solenoid valve assemblies
- Fully engineered linear actuator position systems
- Fully tested and ready to install

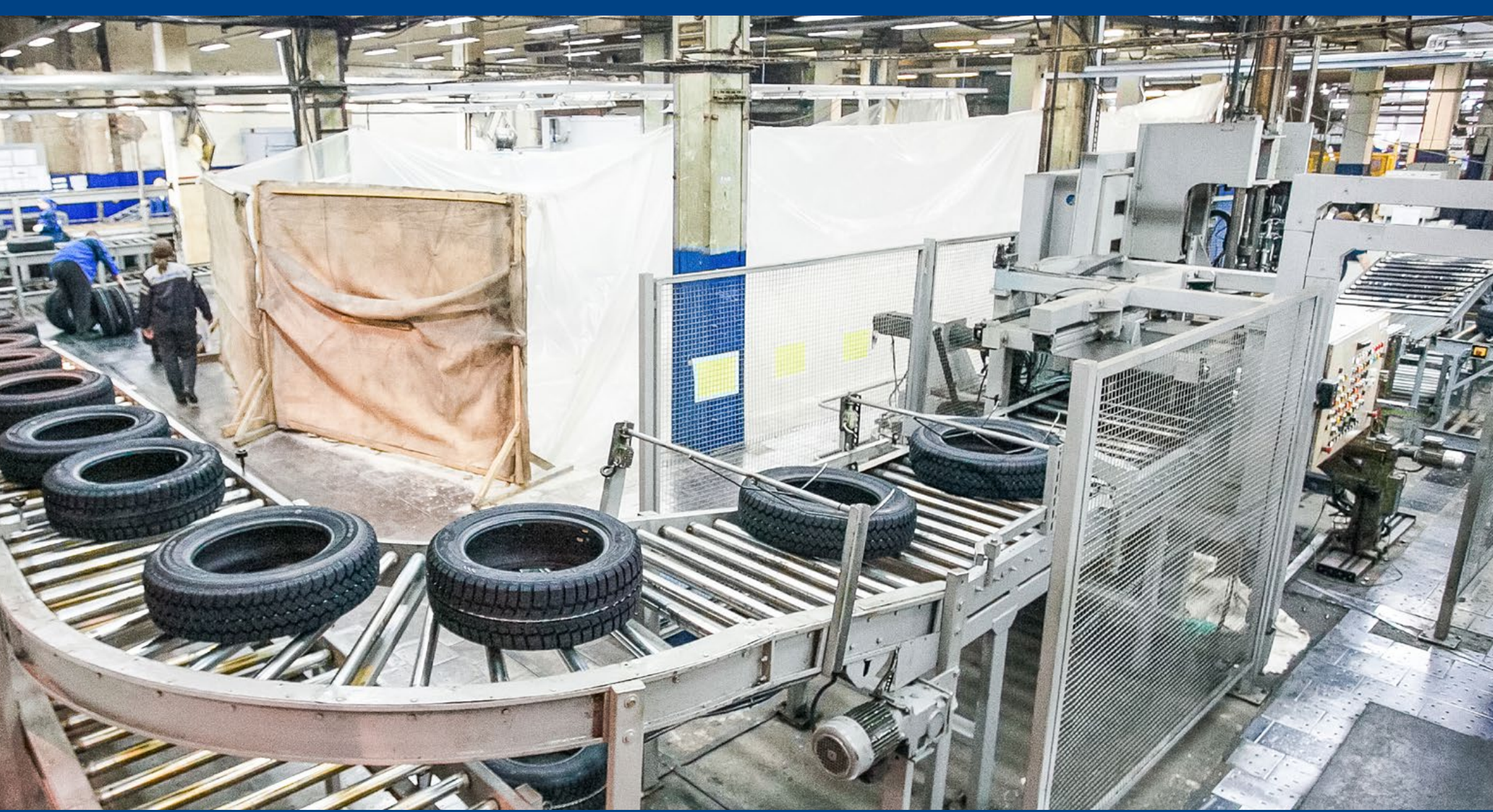
Panel mount solutions

- Compact ready-to-install solutions
- Components certified to meet requirements of application
- Customized solutions to your needs

Enclosure solutions

- Fully tested and certified turnkey solutions
- Reduced interfaces, gateways, components and wiring
- Simplified architecture, less design and engineering work





Using our extensive design and engineering expertise, you can meet tighter timescales and reduce project start-up times. Contact us today!

Get started



Emerson delivers time-tested and innovative fluid automation solutions designed to help you improve your operation's overall uptime, performance and flexibility. Contact us now for world-class technologies, and services that can maximize your throughput, lower your cost of ownership and support your product innovations. Getting started is easy.

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