TIRE INDUSTRY

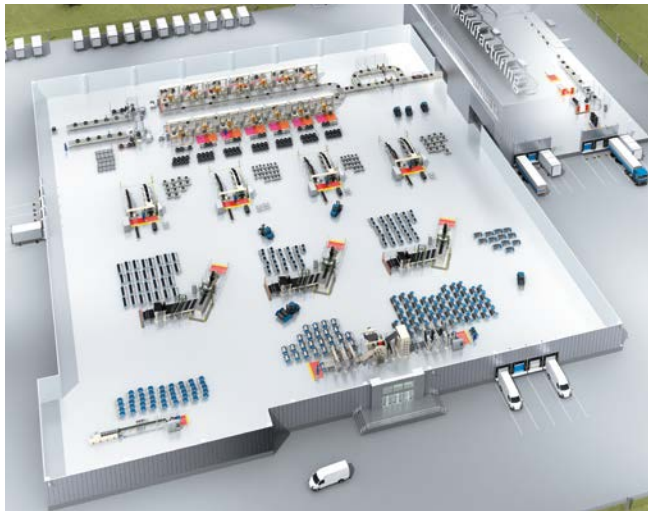
EFFICIENT APPLICATION SOLUTIONS

SICK
Sensor Intelligence.

CHALLENGES FOR THE TIRE INDUSTRY

Sensor solutions for the entire production process

Tire manufacturing is a complex process that places high requirements on quality and safety. All large tire manufacturers and tire machine builders count on SICK as a reliable partner to provide solutions to these demanding tasks. Highly efficient and flexible production is essential in order to meet market requirements for quality and price. The challenge is to make production machines safer and increase production quality under harsh environmental conditions. This also requires product traceability over the entire production cycle. This is where SICK uses its comprehensive sensor and industry expertise to produce ideal solutions.



Learn more about sensor solutions for tire industry
→ www.sick.com/de/en

Safety

Safe machines ensure high productivity. SICK offers the widest portfolio of safety solutions: marked by a high degree of integration in its controls and accompanied by an extensive range of services that includes consulting, commissioning, and training and education.

Flexible automation

Numerous production steps are required in order to create tires from a large number of different materials in a wide variety of machines. As a mass product, produced in type-related mass production, high flexibility is required in production. SICK supports you by providing sensors for the flexible automation of your production processes.

Quality control

Quality testing is required from the outset to ensure a consistent quality and reliability of the tires. From high-precision measurement of web thickness during the extrusion and calendaring process, edge guiding and surface testing, right through to precise 3D measurement of the tire shape:
SICK offers the right sensor solution for any application.

Track and trace

Marking with bar codes is standard, but the properties of the tires as well as the material-handling environment mean that identification puts high requirements on code reading. SICK offers ideal industrial reading systems for the tire industry, with easy integration, high durability and superior read rates, as well as the ability to get operations back up quickly in the event of a failure.

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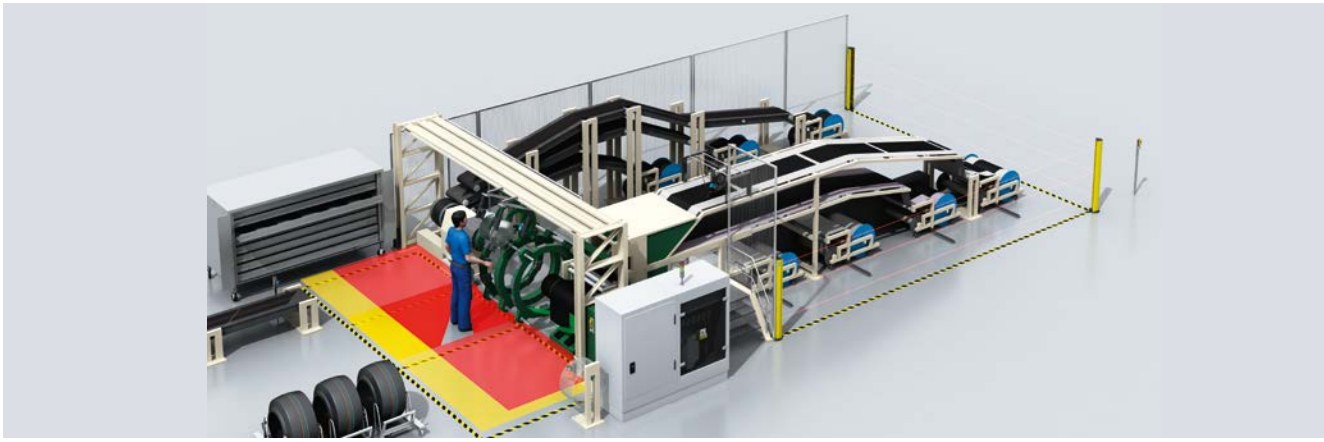
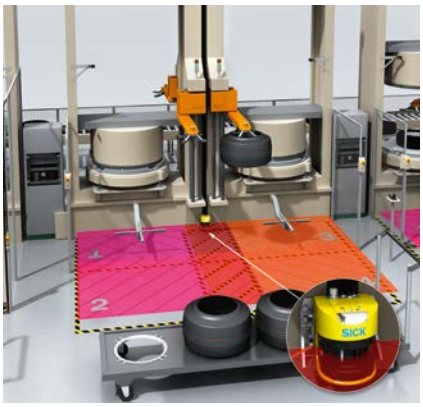
SAFETY





Hazardous area protection with safety laser scanners

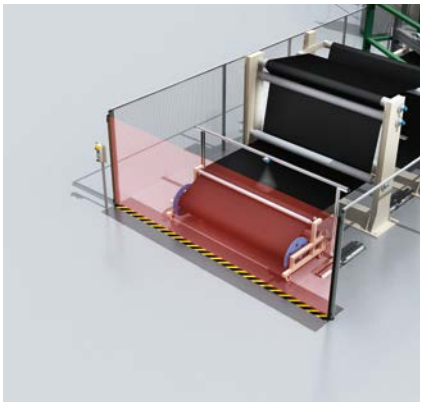
The S3000 safety laser scanner protects the hazardous area in front of a tire curing machine. Four simultaneous protective fields are available in conjunction with the Flexi Soft safety controller. This allows one safety laser scanner to monitor four hazardous areas at the same time. Thanks to the two upstream protective fields in front of a machine, the movement of the automatic handling units are stopped by the outer field and the movement of the upper part of the mold is stopped by the inner protective field. Productivity increases as a result because processes are able to run independently of one another.

→ www.sick.com/de/en/S3000_Standard

Safe control solution

Safety switch, emergency stop pushbuttons, and opto-electronic safety devices can be connected to the Flexi Soft modular safety controller. Gateways for all conventional fieldbus systems are available. When used with the Flexi Soft Drive Monitor, it enables safe implementation of a speed monitoring system for setup using enable switches.

→ www.sick.com/de/en/Flexi_Soft



Hazardous area protection with safety light curtain

The deTec4 Core safety light curtain reliably monitors hazardous area in front of the wind-up machine. The deTec4 Core protects the area easily and with high availability. Once manual work in the hazardous area has been completed, an operator acknowledgment is necessary.

→ www.sick.com/de/en/deTec4_Core

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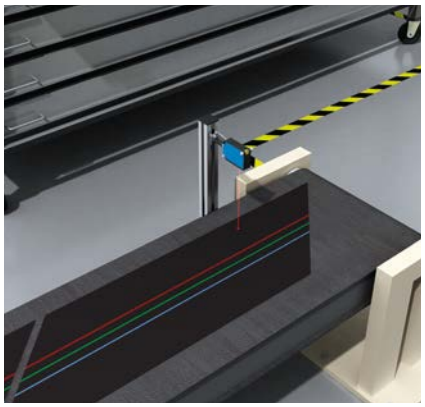
FLEXIBLE AUTOMATION



Reliable material detection on the belt

Safely detecting black, shiny tire rubber on the belt is a challenge for optical sensors without reflectors due to the low levels of contrast. This is where the MultiPac MultiTask photoelectric sensor with double-sensor principle from SICK offers maximum operational safety. MultiPac detects objects extremely reliably and redundantly even in extreme sloping positions. The intense, well visible light spot and the teach-in button facilitate a quick and easy set-up.

➜ www.sick.com/de/en/MultiPac

Monitoring level, temperature, and pressure in the hydraulic unit

The LFP Cubic TDR level sensor offers limit and continuous level measurements with only one single device. The LFP Cubic has a high resolution and accuracy, and offers optimal repeatability. The TBS temperature sensor performs temperature monitoring. The PBS pressure switches regulate the pressure in the hydraulic system of the presses. The PBS has no mechanically moving parts and is therefore wear-free, stress-free, and maintenance-free. The dual-rotational housing enables flexible installation.

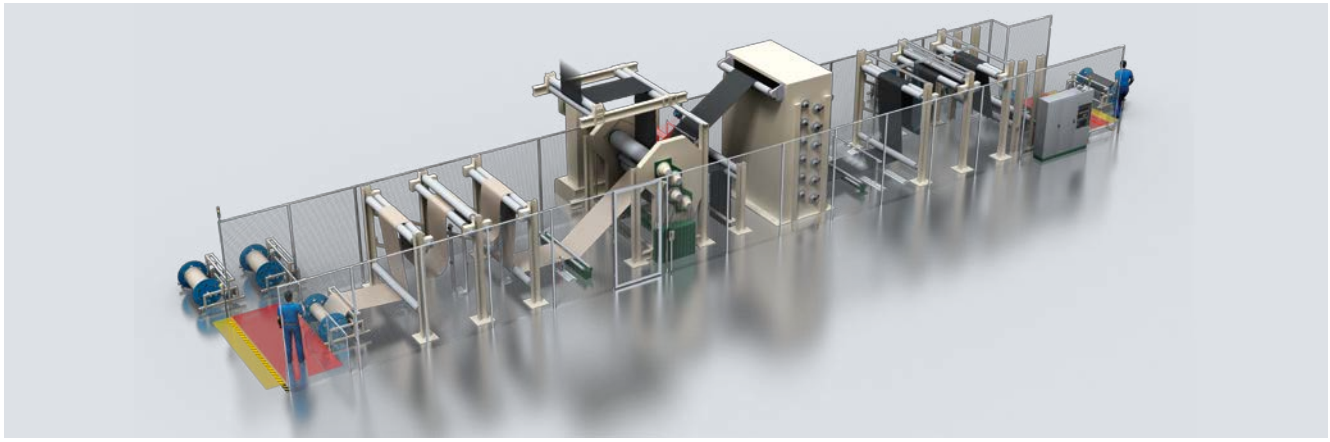
➜ www.sick.com/de/en/PBS
➜ www.sick.com/de/en/LFP_Cubic
➜ www.sick.com/de/en/TBS

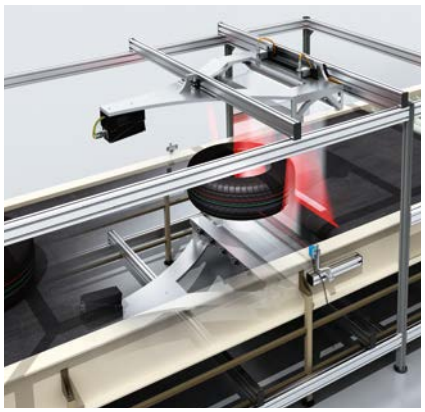
Loop control: loop measurement

Loop control enables decoupling of processes such as calendaring and material infeed and out-feed when replacing the bobbin. Photoelectric retro-reflective sensors, such as G10, WL18, or WL27, are responsible for loop measurement (loop full or empty) to determine the minimum and maximum sag of the loop. Measurement sensors like Dx35 and Dx50 series can provide continuous measurement for precise control with analogue outputs or also provide taught-in switching points with only one sensor installed on top or below. For demanding applications also ultrasonic sensors like the UM30 or automation light grids may be applied.

➜ www.sick.com/de/en/G10
➜ www.sick.com/de/en/W18-3
➜ www.sick.com/de/en/W27-3

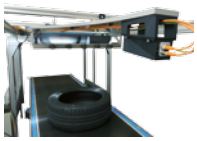
QUALITY CONTROL



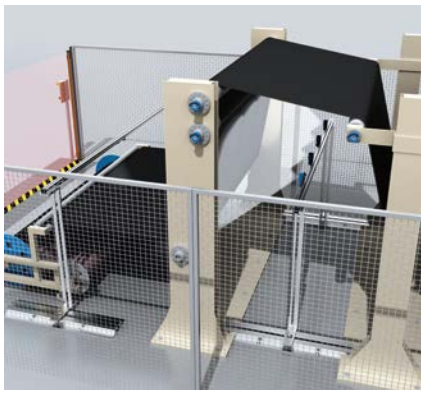


Marker inspection with IRIS-M

Markers, such as painted and glued markers, are used in the manufacture of tires. They serve as an orientation guide while mounting the tire on the rim and must therefore be clearly visible. The IRIS-M quality control system reliably detects and validates the markers. IRIS-M processes both 3D and color information. This means that, the IRIS-M can reliably differentiate between markers by color and, the 3D technology makes the application resistant to ambient disturbances. The complete solution can be seamlessly integrated into the production process as a superstructure or substructure system and enables complete monitoring as well as high throughput simultaneously.



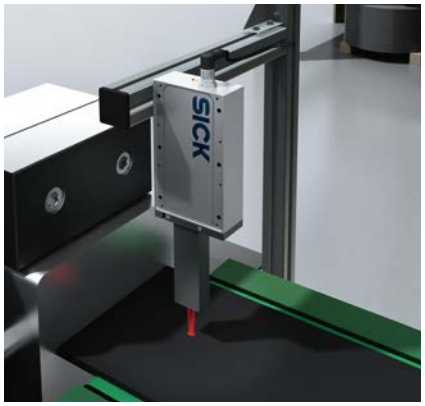
→ www.sick.com/de/en/IRIS_M



Inspecting the surface of the calendared rubber

After calendaring the rubber onto the textile tape, the quality of the material is inspected. Multiple 2D vision sensors Inspector monitor the material across the entire width, reliably identifying surface defects and color deviations.

→ www.sick.com/de/en/Inspector



Linear measurement sensor for non-contact speed measurement

When extruding tire rubber, the belt thickness of the tire material must be adhered to exactly in order to ensure product quality of a consistently high standard. This requires precisely synchronizing the release speed of the tire material on the belt to the continuous forward feed of the extruder press. The OLV linear measurement sensor measures the speed directly on the material without slipping, therefore making a significant contribution to the constant optimization of the product quality.

→ www.sick.com/de/en/OLV

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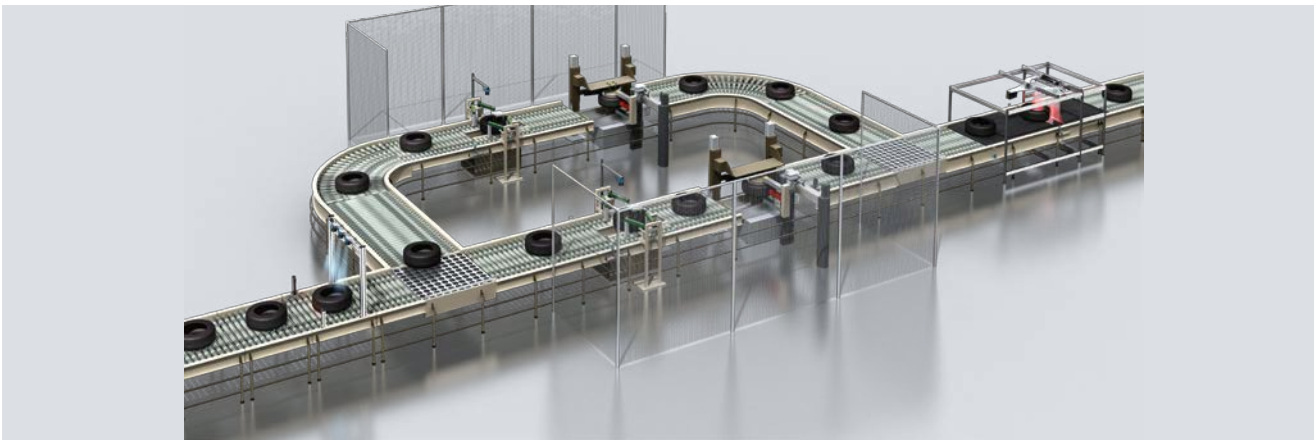
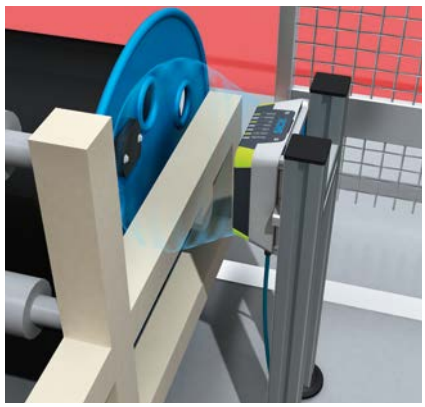
TRACK AND TRACE



Tire identifiation

To identify raw and finished tires reliably, regardless of their size, position, and alignment of bar codes, as well as on different conveyors, SICK has developed the Tire Lector Array tire code reading system. The modular system consists of high-resolution Lector65x image-based code readers and is adjusted to the width of the conveyor. Dynamic focus and dynamic brightness adjustment for sharp and uniform images at different object heights (especially for truck tires) minimize the number of cameras required. Sophisticated design and individual pre-assembly facilitate easy installation and maintenance.

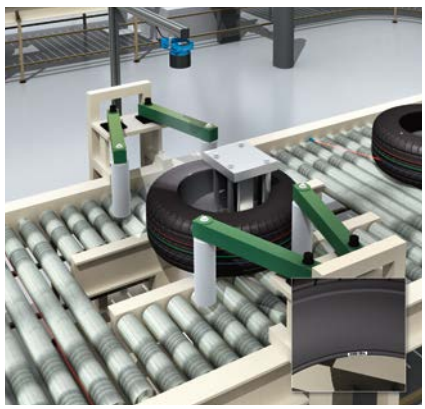
→ www.sick.com/de/en/Lector65x



Material roll identification with RFID technology

Ensuring complete traceability in the tire production process requires documenting process steps and identifying materials. For this purpose, material bobbins are given RFID tags that are detected by reading devices with great sensing ranges. The highly resistant transponders boast an impressively long service life even in the harsh environmental conditions of the tire production process. The RFU620 read/write devices, which are fitted with all the typical industrial interfaces, identify the transponders on the winders. Easy integration provides the variant with Power over Ethernet which means that connection is possible with just one connecting cable.

→ www.sick.com/de/en/RFH6xx
→ www.sick.com/de/en/RFU62x



Spotting

Tires are identified and aligned at the same time in the spotting station. The Lector642 image-based code reader provides high flexibility at the object height and rotation speed thanks to the large field of view and depth of field. Programming the accepted reading field width and the high decoding speed enables the fast and precise alignment of the tire.

→ www.sick.com/de/en/Lector64x

Tire Lector Array (TLA) with Lector65x

Modern tire logistics processes need to meet high requirements and enable a throughput of thousands of tires per shift. And the throughput is not the only factor because the requirements are always increasing. Quality assurance and safety when identifying tires is becoming more and more important every day. In light of these challenges, managing and controlling production processes are the central tasks in automation. The latest generation of SICK image-based code readers has impressively mastered these tasks. The code readers combine unparalleled intelligence and autonomy with innovative technologies such as dynamic focus and adaptive illumination. Thanks to this combination, the Tire Lector Array can detect even poorly printed 1D or 2D codes on tires regardless of height, size, or alignment. The Tire Lector Array is perfectly adapted to the width of the belt. Its modular structure allows customers to select the most cost-effective solution. The Tire Lector Array is the perfect addition to the range of SICK identification devices. Our unique product portfolio includes laser scanners, RFID devices, and image-based code readers, such as the Lector65x, the world's first high-resolution matrix camera with dynamic focus. As our customer, we offer you a wide range of products as well as consulting services from the SICK experts while you choose the optimum technology for you. Working with SICK solutions means that you don't have to reinvent the wheel: you can use the same interfaces as before.

→ www.sick.com/de/en/Lector65x_System

Retrofitting tire curing machines with safety technology

Tire curing machines are generally considered the machine type with potentially the most dangerous working environment in the tire industry. Conventional safety systems for tire curing machines exhibit significant safety gaps when it comes to minimizing dangers. Accidents occur in every operating mode: in manual mode during maintenance and troubleshooting, in tool-change mode, and in standard automatic mode. This situation led to international efforts to standardize safety standards for new machines. Retrofitting existing curing presses with modern safety devices that meet the most recent international safety standards improves the safety level while simultaneously increasing productivity.

SICK is your partner for future international standards for tire curing machines, such as the European standard EN 16474 and the Chinese standard GB 30747-2014.

Changing from your previous safety application to a SICK safety solution increases the profitability of your investment and creates additional saving potential as it makes processes more efficient. This means that you can always keep an eye on the most important objective – occupational and machine safety.

→ www.sick-safetyplus.com/en

SICK offers ultra-efficient complete solutions from a single source: from safe control solutions, to opto-electronic protective devices and safety switches, right through to the SICK LifeTime Services. The services portfolio offers product-independent consulting services through to traditional product service and are characterized by SICK's extensive industry knowledge and more than 60 years of experience.

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SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With almost 7,000 employees and over 50 subsidiaries and equity investments as well as numerous representative offices worldwide, we are always close to our customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in various industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services round out our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is "Sensor Intelligence."

Worldwide presence:

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and additional representatives → www.sick.com

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