

TIRECHECKER QUALITY CONTROL SYSTEM FOR FINISHED TIRES

Typical measurement speed	
Tire rotation frequency:	1 rps - 2 rps
Measurement frequency:	2 kHz - 4 kHz
Example of a typical sidewall sensor	
Measurement range	
Measurement width (radial):	80 mm
Measurement height (axial):	50 mm
Measurement distance (axial):	50 mm
Measurement resolution	
Height resolution (axial):	min. 30 µm
Radial resolution:	0.6 mm
Tangential resolution:	0.5 mm - 1.0 mm
Example of a typical tread sensor	
Measurement range	
Measurement width (axial):	400 mm
Measurement height (radial):	50 mm
Measurement distance (radial):	300 mm
Measurement resolution	
Height resolution (radial):	45 µm
Axial resolution:	1.5 mm
Tangential resolution:	0.5 mm - 1.0 mm

All technical data including the housing dimensions and the measurement distance can be adapted within a wide range to the specific customer's requirements. The measurement can be synchronized with the tire rotation speed via rotary encoder signal.

Development Center
 X-ray Technology EZRT
 a division of Fraunhofer Institute for
 Integrated Circuits IIS
 in cooperation with Fraunhofer IZFP

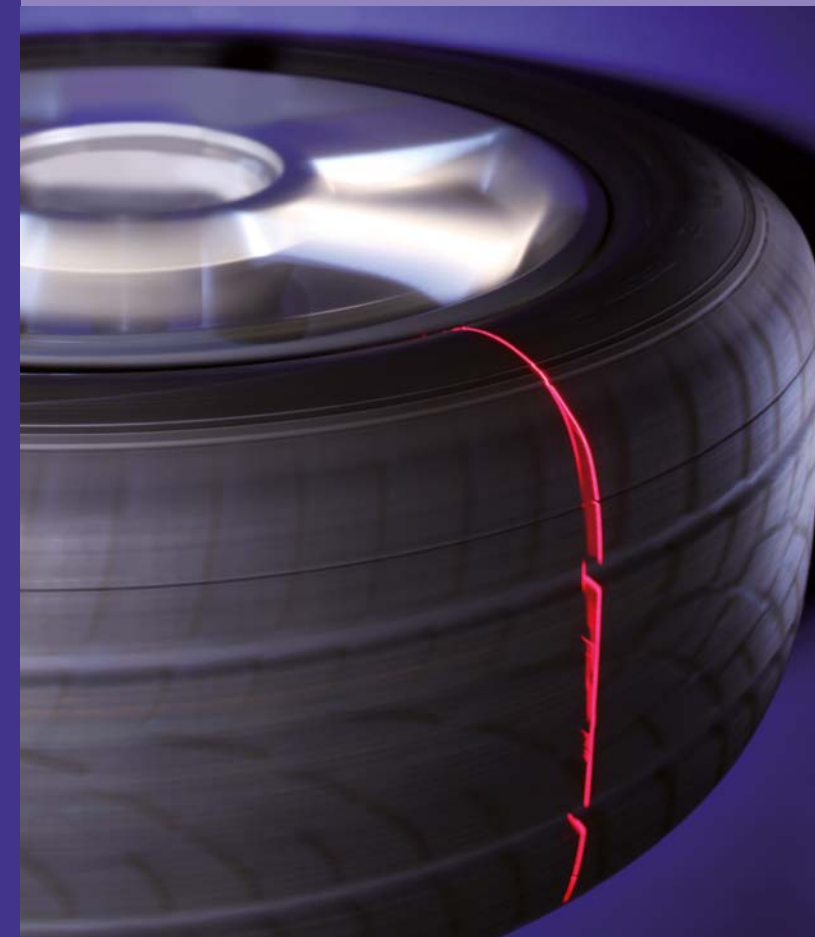
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TIRECHECKER ALLOWS COMPLETE GEOMETRY MEASUREMENTS AT HIGH SPEED

Motivation

The TireChecker quality control system is a standard solution when reliable inspection and precise measurement of high-quality tires for geometry and bulges is required.

With more than 15 years of service, leading tire manufacturers worldwide trust the TireChecker as a proven solution for testing of tires.

The system was developed at the Fraunhofer IIS in close cooperation with key tire manufacturers and testing equipment builders. It is available integrated into turn-key systems or as an upgrade from our licensed partners. It is also available for licensing to offer testing machinery suppliers a cost effective solution for sheet-of-light geometry measurement.

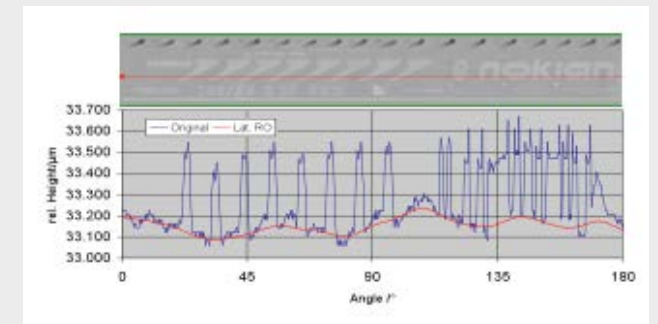
System information

The TireChecker system uses contactless laser sheet-of-light sensors and custom image processing algorithms to measure all relevant geometric features of a tire precisely and quickly, keeping pace with today's production. The system's modular architecture allows flexible adaptation to virtually any geometric measurement task, environmental constraint and budgetary requirement. Anything from a simple system consisting of a single sidewall sensor to a full system covering the tire's entire surface is configurable. Bulge measurement is performed on the entire sidewall regardless of lettering or other surface features. Custom measurement algorithms can also be integrated into the software on request.

Existing laser sensor equipment can be utilized if required; design of customer specific sensors is available as well. Existing machinery can be upgraded with a TireChecker system or it can be designed into new tire testing machines, being customizable to fit different mechanical situations as well as capable of being integrated into a number of PLC architectures.



Bulge detection without influence of lettering.



Lateral Runout Measurement (red) on lettering (blue).