

Technical Data

Technical data of a typical sensor system:

Tire rotation frequency	typ. 65 rps
Tire Speed	up to 460 km/h
Synchronization	rotary encoder provides accurate position reference
Measurement width/height	customer specific *
Laser	Class 3B

Measurement resolution

Height resolution	0.05 mm *
Lateral resolution	0.15 mm *
Circumferential resolution	dependent on resolution of rotary encoder (max. 4096)

* All technical data can be adapted to meet specific customer requirements.

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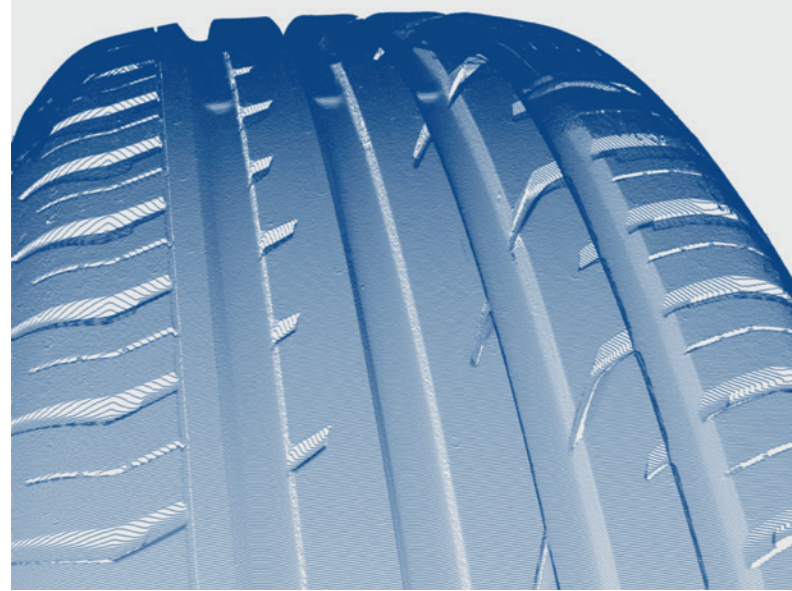
High Speed 3D

Tire Contour Measurement

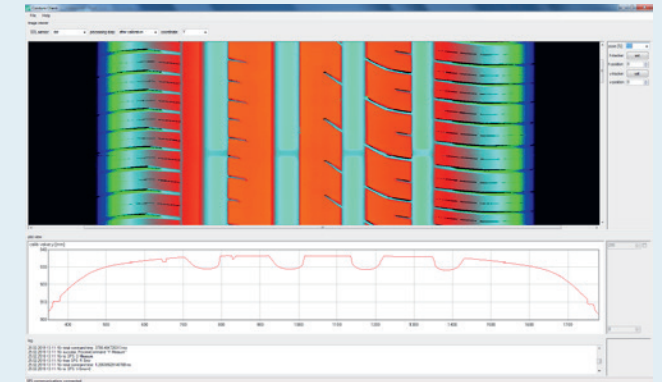
Motivation

Knowledge about the dynamic deformation of tires at extreme speeds is an important issue for tire development. Fraunhofer IIS has developed a dedicated laser sheet-of-light technology based 3D sensor and software system for fast 3D measurement of tire geometries at high speeds. This sensor system can capture the complete surface of a tire at surface velocities of up to 460 km/h.

The laser sheet-of-light technology can be combined with a mechanical precision handling system yielding the overall bead-to-bead contour of a tire of almost arbitrary dimensions. 3D reconstructed data, real-time 3D views and profile cuts of the tire can be analyzed.



Visualization of high resolution 3D measurement



False color view of tire measurement data and height profile display

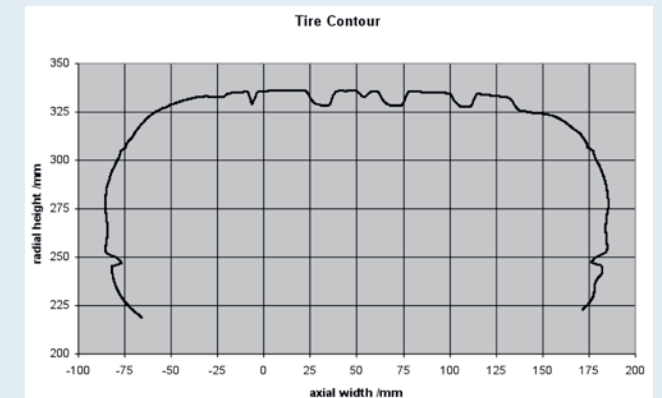
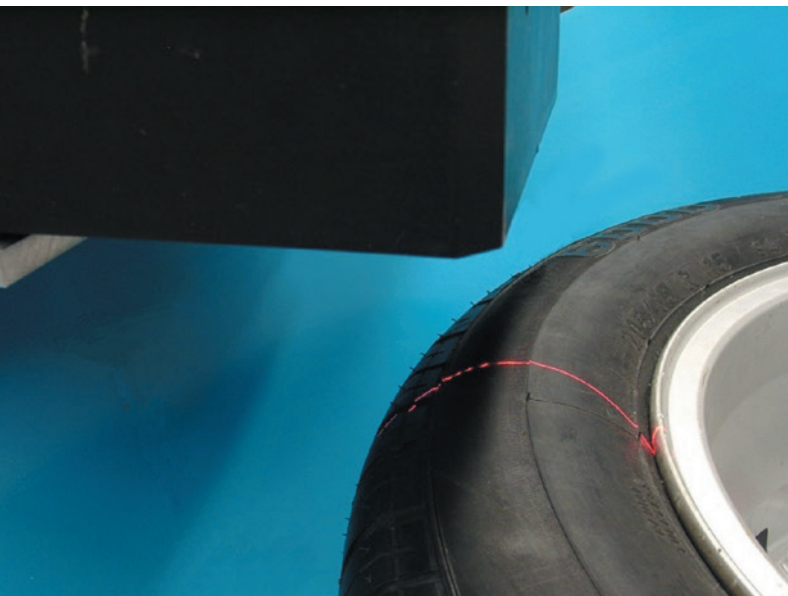
Operating principle

The tire's surface is captured in its entirety at high speeds using bead-to-bead laser sheet-of-light measurement with a multi-sensor array. The number of sensors is scalable according to the specific customer's requirements.

Software

The Windows-based software features include:

- Automatic fusion of sensor data into single calibrated tire surface contour
- Analysis of height profiles as well as raw measurement data
- Automatic measurement parameter configuration
- Automatic sensor adjustment procedure
- Generation and export of calibrated 3D data



Bead-to-bead profile visualisation