



## Measurement of force and torque with Sensotect

### Sensotect coating system

With the innovative thin film sensor technology Sensotect, Schaeffler is introducing intelligent coating systems into the automotive and industrial sectors.

Sensotect allows, with neutral effect on design envelope and in real time, measurement of the load condition at locations where classic sensors such as adhesive bonded strain gauges cannot be used.

The functionality is achieved by means of a strain-sensitive metal coating with a thickness measured in the submicrometre range that is structured by microprocessing. This measurement structure allows the continuous measurement of force and torque during operation.

With the aid of modern thin film technology, the component becomes a sensor and the sensor becomes a component. Due to this measurement technology, it is possible for example to determine the torque of drive shafts or in vehicle gearboxes very quickly and precisely. Engine power can then be set exactly to the load occurring. In this way, Sensotect makes an important contribution to saving energy and fuel and ultimately helps to reduce CO<sub>2</sub> emissions.

*Figure 1*  
Wheel bearing  
with Sensotect coating



# Measurement of force and torque with Sensotect

Both the automotive and industrial sectors offer numerous areas of application in which the integrated sensor coating can make a contribution to digitalization.

- Sensotect** Multi-layer system comprising insulation layer and strain-sensitive metal coating.
- Coating process ■ PVD method and microstructure processing.
- Advantages, benefits ■ Very precise measurement of force and torque on functional components where the possibilities associated with conventional methods are limited
- Sensor layer is deposited directly on the substrate surface
  - Measurement possible on 2D and 3D geometries
  - Sensor technology with neutral effect on design envelope
  - No use of adhesives or transfer polymers
  - Continuous measurement of force and torque during operation
  - High sensitivity with very little deviation in hysteresis and linearity
  - No temperature deviations
  - No ageing effects
  - Wireless transfer of data and energy (telemetry).
- Common applications ■ Bearings
- Axles
  - Shafts
  - Individual bending beams.

## Characteristics

Feature	Coating
Composition	Multi-layer system comprising insulation coating and strain-sensitive metal coating
Structure	Meander structure
Colour	Light grey to beige (matt)
Layer thickness	approx. 10 µm

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