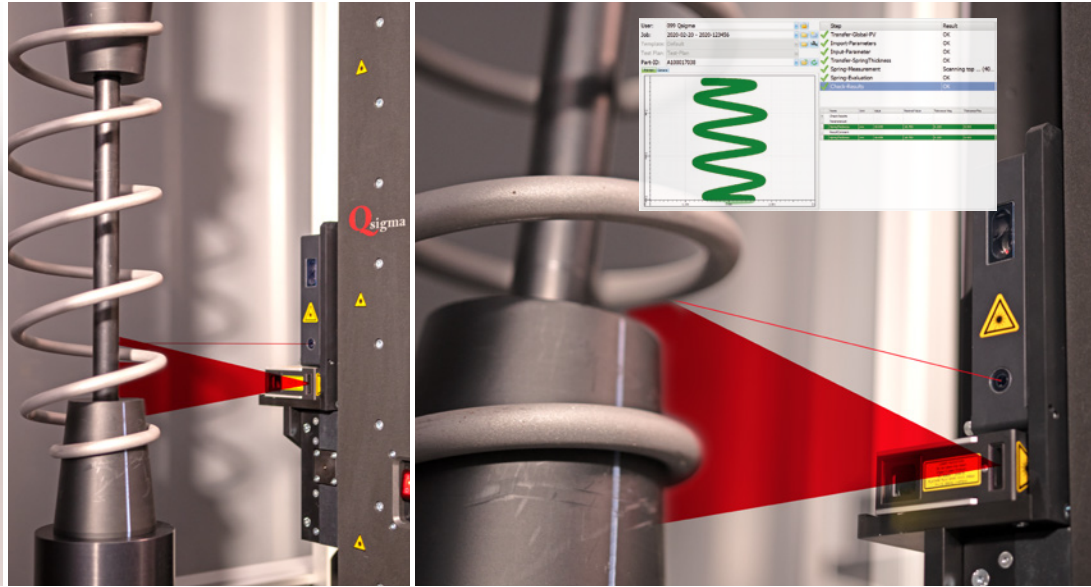




3D measurement of coil springs

Qsigma designed the Spring Measurement System (SMS) for precise 3D measurement of coil springs and other components. It is used, among other things, in the development of prototypes and 100% inspection of series parts. The SMS automatically identifies the spring, evaluates the wire contour and determines the wire diameter, even if it is subject to strong fluctuations. For comparative evaluations, an automatic centerline determination is performed. Sensors from Micro-Epsilon are used in these high-precision measurement tasks.

The SMS is a compact measuring cell in which the spring to be tested rotates on a longitudinal axis. During rotation, two linear axes move a scanCONTROL 2950 laser profile scanner over the part in horizontal and vertical directions. To achieve maximum accuracy, the sensors are optimally positioned using algorithms developed by Qsigma. The laser profile scanner transmits the generated individual profiles to a computer via a Gigabit Ethernet interface, which converts the data into a 3D point cloud and displays it on a monitor.

The scanCONTROL 2950 sensor has a large measuring field in both the Z and X directions. This enables extremely fast scanning of springs up to a height of 70 cm and radially up to 30 cm. The wide range combined with high point density enables precise evaluation of the wire diameter. Due to the large Z-axis range, both the spring path and the spring end can be detected automatically.

Since the sensors work almost independently of the surface, even painted or powder-coated springs can be measured reliably.

Requirements for the measurement system

- Large sensor measuring range: up to 100 mm
- High resolution in X and Z direction
- Fast measurement: up to 1,000 profiles/second
- Fast and reliable measurement results
- Compact sensor design

Ambient conditions

- Sensor in closed measuring cell
- Possible applications in development laboratories, prototype construction and during production

System configuration

- 1x scanCONTROL 2950
- 1x optoNCDT 2300 (optional, depending on the measuring object)

Advantages

- High accuracy thanks to micrometer resolution and excellent signal quality
- Easy integration thanks to compact design and extensive sensor SDK
- Fast exposure control and surface compensation for wide material strip width

