



*Rapid Strain and Stress Analysis
- for Component Testing,
fatigue Investigation and Validation of FEA*

Strain Measuring System Q-100

Fast Determination of Full-Field Strain and Stress

The Q-100 is a unique device for rapid strain measurement on any component without preparation or marking.

Especially Designed for fast Component Testing

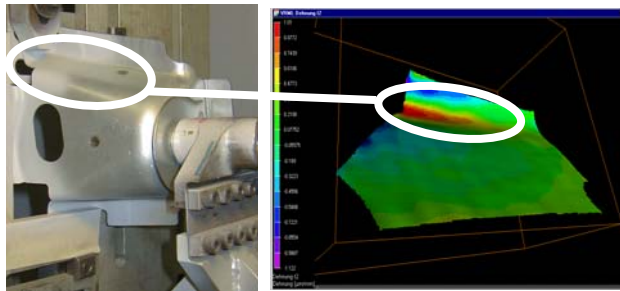
The Q-100 is positioned on the surface of the area to be inspected (using adapter rings). It automatically analyzes the surface contour and three-dimensional deformation of the inspected area when a load is applied to the component. From these data the complete strain field is derived within seconds.

Save Time and Money with Q-100

Q-100 strain measurement requires nearly no preparation work and can significantly reduce the testing time for complex components compared to traditional methods like strain gauges.

Complete Information with one Measurement

The optical full field measurement enables the detection of strain gradients and increases the reliability of the strain analysis. The recording of the complete surface information allows the calculation of all relevant data such as principle strains and stress, shear strain/stress, in-plane and out-of-plane displacement etc.



Measurement of critical strain concentrations in fatigue test

Measurement Principle

Q-100 uses the principle of 3D speckle interferometry to measure the deformation and the surface contour of the measuring field. The measurement surface is illuminated with laser beams from 4 different directions and the scattered light is recorded with a central CCD chip. Using the interference effects of the laser light, the surface displacement is measured with sub micrometer accuracy. Additionally, the three-dimensional surface geometry is recorded. This allows the user to quantify the three dimensional surface deformation and strain field automatically. With known material properties (Young's E-modulus, Poisson ratio) the stress distribution can also be determined in the measurement area.



Q-100 System including sensor, mobile measurement system, software, assembly kit

Application

The sensor head is directly attached to the component to be inspected. The basic system contains a set of different mounting devices, which easily allow the adaptation of the Q-100 sensor head to curved and flat surfaces. Q-100 is readily calibrated and does not require special elaborate training for reliable use. It is easy to operate and can be applied, quickly, in a wide variety of testing set-ups.

Technical specifications	
Measuring resolution	
Displacement:	0.3 ... 0.1 μm typical
Strain:	5*10 ⁻⁶ ... 20*10 ⁻⁶ typical
Measuring area	ca. 35 x 25 mm ²
Measuring range	Up to several 1/10 mm deformation
Spatial resolution	ca. 0.5 mm
Sensor head dimension	54 x 54 x 59 mm ³
Sensor weight	370 g
Length of sensor cable	4.5 m
Data output	Data field with Strain / Stress components, Shear strain / stress, Principal strain / stress, Comparable stress
Data interface	TIFF, ASCII, Windows metafile, VRML
Operation system	Windows XP

Options	
Gauge Software Module	Advanced analysis of measurement data
VRML Software Module	Interface to Simulation Software (FEA, CAD): superpose measurement data to simulated data
Record Software module	Recording up to 4 external analogue signals (e.g. force, temperature, pressure, etc.)



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