

Golden Eye Shearography-System

With the help of shearography non-destructive testing of compound materials (glare, carbon fibre reinforced plastics (CFK), GFK) and the detection of hidden defects under the surface of a structure component are feasible using a dynamic or thermal load on the component's surface.

Inner defects like delaminations, cracks, disbondings, inclusions, dents and impacts become visible as local discontinuity when illuminated with laser light and the measured sheared images are evaluated using the system software.

The necessary shear and the phaseshifting procedure of the Golden-Eye system are not implemented as in conventional systems, which use mirrors with micromechanical alignment, but it makes for the first time use of an electronic spatial light modulator (SLM, Liquid-Blaze technique) to achieve both requirements (pat.-reg.).

The advantage of this technology is that no micromechanical adjustment is necessary. Hence a very robust, electronically controllable system is available which has a fast, reproducible alignment of the shear and the necessary phase shifts. In addition the system allows for user-defined manipulation of the acquired wavefield – extending the measurement possibilities (phase retrieval, holography, ...)

The load on the component under investigation can be applied thermally or mechanically.

The latter is performed dynamically using a piezo-transducer, which is applied on the object's surface with the help of a vacuum adapter.

The transducer injects mechanical vibrations with variable energies and frequencies.

The thermal load is placed using an infrared heater which is controlled from the system.

Purchased parts package:

„Golden Eye“ shear sensorhead

Controller including: vacuum pump, power amplifier, frequency generator, laserdriver, power supply, laptop, software, remote control.

Option: laser-modul A or B, respectively, piezo-transducer, infrared - heater

Developed in cooperation with BIAS - Bremer Institut für angewandte Strahltechnik

Shearography-sensor

Dimensions : 250x200x80mm
 Measurement area : 6x8cm ... 30x40cm
 Dynamic load : Piezoactuator
 Frequency : 100 Hz ... 100 kHz
 Piezo-Amplitude : $\pm 1\mu\text{m}$

Controller, Vacuum, F-Generator, Amplifier
 Dimensions : 440x220x220mm

Lasermodul A Kl. 4 (B Kl. 1)

Dimensions : 140x75x60mm
 Wavelength : 806nm (658nm)
 Output power (max) : 1,8W (4x 100mW)



Liquid-Blaze



„Golden Eye“
with laser-modul A, B



Vacuum pump
 Laserdriver
 Frequency generation
 Piezodriver
 Controller, remote control



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