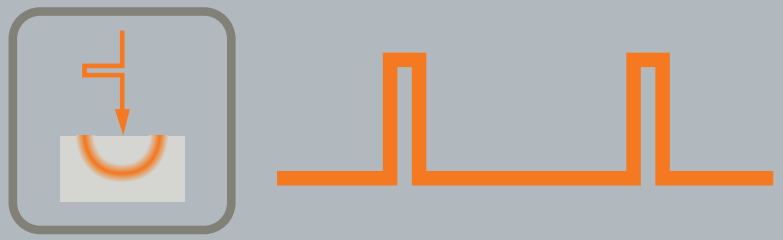
edevis®

PTvis

Pulse
Thermography

Test system for laboratory use

Pulse thermography is a non-contact test method, well suited for characterization of thin films and coatings or for flaw detection. The extremely short test duration and high detection sensitivity makes PTvis a powerful tool in non-destructive testing. The lock-in technique allows the quantification of material thickness, porosity or thermal diffusivity. In addition, disturbances such as varying surface properties or inhomogenous heating are suppressed. With this fast and imaging method, the interpretation and documentation of the test results is clear and simple. The test system is modular and can be extended with other edevis excitation modules (e.g. OTvis, UTvis or ITvis).



APPS/FUNCTION

Typical applications

Automotive applications

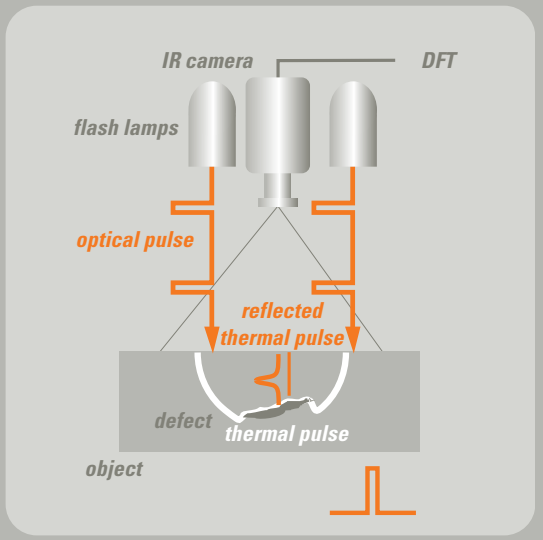
- Measurement of layer thickness in multilayer systems (e.g. ceramic-coated metal)
- Characterisation of paint
- Measurement of film and coating thickness
- Flaw detection on adhesive, welding and soldering joints

Aerospace applications

- Inspection of composite material (e.g. CFRP)
- Measurement of coatings (detection of delamination, adhesion, thicknesss)

The principle of pulse thermography

Pulse thermography is used for analyzing interfaces, thicknesses and material defects in components and coatings. The thermal balance of a component is disrupted using a short pulse of energy. This disturbance decays rapidly by heat conduction. The decay behavior contains the desired information about many material properties. The heat is supplied by powerful xenon fl ash lamps. A fast infrared camera takes the thermal image sequence following the energy impulse. The acquired image sequence is analyzed pixel by pixel, online or in post processing. Optimized algorithms such as the pulse-phase analysis using Fourier transform allows for quantitative evaluation of the measured signal. Calibrations enable to determine related physical quantities, e.g. coating thickness or thermal conductivity.



SPECIFICATIONS

Excitation

Flash Energy	3kJ up to 12kW
Connectors	2 Flashlamps
Supply	380V alternating current, 16A, 50Hz
Cooling	Built-in ventilators
Fusing	16A
Overload protection	√

Flashlamps

High-power flash lamps with robust aluminum housing
Xenon tube with maximum energy of 6 kJ
Exchangeable reflectors
Optimized spectral emission
Ventilator or pressed air cooled
Robust tripod incl. gear set

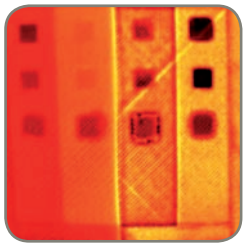
Software

Real-time lockin	√	Sequence acquistition	P
Arbitrary Signals	P	Parameter storing	√
Offline Storing	P	Remote control (DDE)	P
Phase representation	√		
Amplitude representation	√		
Live image overlay	P		

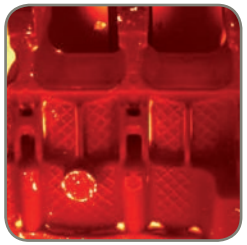
P= only for PRO version; √= Standard and PRO version

Camera (options)

Detector	InSb or MCT
Pixel	640x512 or 320x256 Pixel
Spectral sensitivity	3-5 µm or 8-9 µm
Frame rate	100 Hz @ 640x512
Interfaces	CamLink or Gigabit Ethernet
Exchangable lenses	12mm, 25mm, 50mm, 100mm, G1- G5



CFRP component inspected with PTvis 8000, showing carbonfibre honeycomb structure with metal inserts



Section of a coated engine block. Detection of film adhesion with PTvis

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