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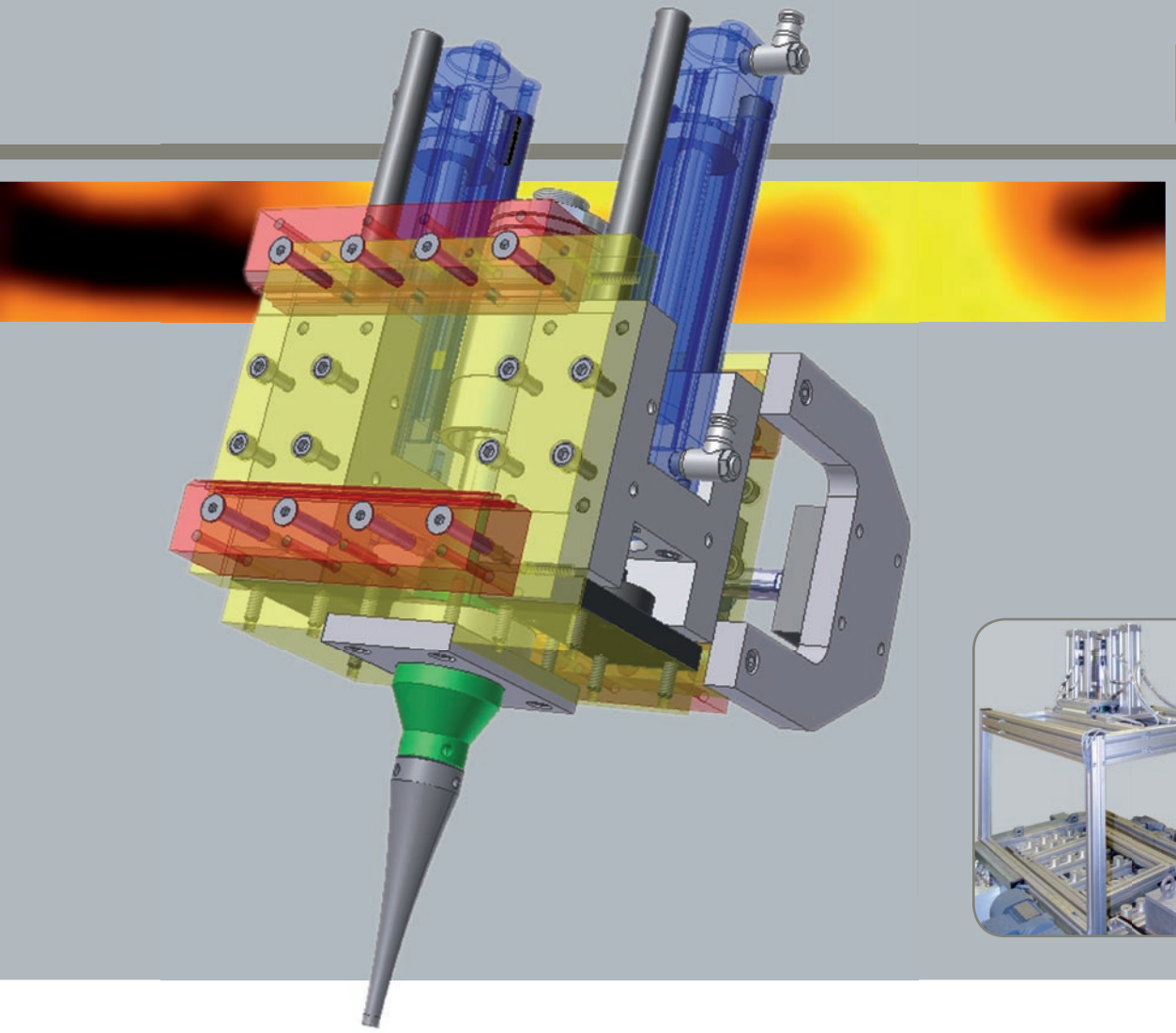
# UTvis

## *Ultrasound excited Thermography*





***Fully automated ultrasound thermography in industrial series production***

*Ultrasound thermography is a powerful test method for defect selective indication of cracks, disbonds, or delaminations.*

*UTvis test stands are based on digital high-power ultrasound generators and converters as excitation sources and high-sensitive infrared cameras. A temperature resolution of 16 mK and frame rates up to 400 Hz (full frame mode) in lockin or burst mode enables to detect smallest dissipative effects and allow for a reliable flaw detection with minimum of mechanical load for the component.*

# APPS/CONCEPT

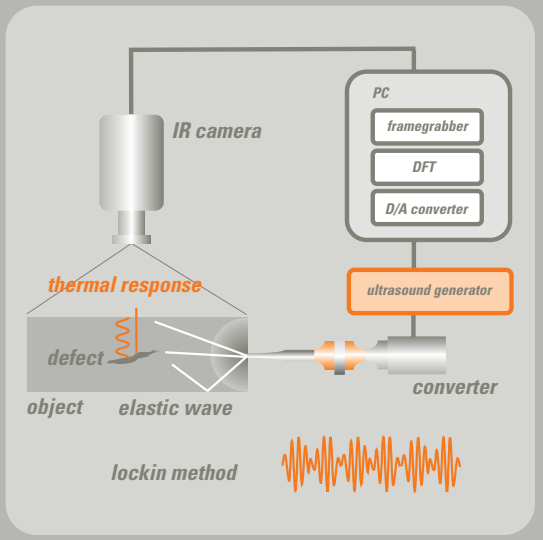
## *Typical applications*

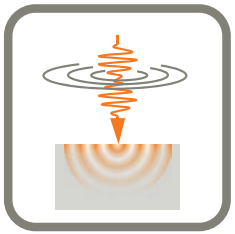
*Ultrasound thermography is an excellent method for defect selective detection of material defects in the following applications.*

- *Crack detection (open as well as closed cracks, independent of their orientation in the material)*
- *Testing of adhesive, rivet, and welding joints*
- *Characterization of multi-material compounds*
- *Detection of delaminations and impacts in fiber composites*

## *The principle of ultrasound thermography*

*Ultrasound Thermography uses the interaction of mechanical and thermal waves to detect material defects. If a defect in a component absorbs the injected, high-energetic ultrasound waves, it will locally heat up* ***(defect selective dark-field method)****.*
*The resulting temperature gradient on the surface of the inspected specimen is measured by an infrared camera, visualizing the dissipated energy. Depending on the application, there are two derivatives of this method: the very fast burst phase analysis and the sensitive lockin method. In both cases the evaluation calculates the time delay between injected energy and the thermal response, resulting in a robust and reliable technique, which is invariant against surface properties or ultrasound distribution.*





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# SPECIFICATIONS

***UTvis is available as UTvis 2000/ UTvis 4000/ UTvis 6000 version***

***Excitation***

*Converter: piezo-ceramic actuator*
*Power: up to 4 kW at 20 kHz or 0,8 kW at 40 kHz*
*Frequency range: 15 kHz – 25 kHz or 30 kHz – 50 kHz*
*Option: hand holder with integrated start button*
*Option: measurement table with pneumatic coupling system*

***Generator***

*Digital Ultrasound Generator*
*2 kW / 4 kW / 6 kW version available as 20 kHz version*
*Robust 19" industrial housing*
*Supply: 220 V 16 A (2 kW), 400 V 32 A (4-6 kW)*

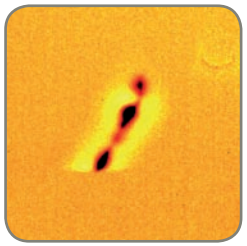
***Software***

| | | | |
|---|---|---|---|
| *Real-time-lockin* | √ | *Sequence measuring* | *P* |
| *Arbitrary signals* | *P* | *Parameter files (xml)* | √ |
| *Offline storing* | *P* | *Remote control (DDE)* | *P* |
| *Phase images* | √ | *Frequency Analysis* | *P* |
| *Amplitude images* | √ | | |
| *Live image overlay* | *P* | | |

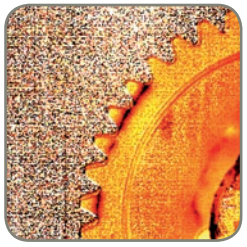
*P= only for PRO version; √= Standard and PRO version*

***Camera (options)***

| | |
|---|---|
| *Detector* | *InSb Oder MCT* |
| *Pixel* | *640x512 or 320x256 Pixel* |
| *Spectral response* | *3-5 µm oder 8-9 µM* |
| *Frame rate* | *100 Hz @ 640x512* |
| *Interfaces* | *CamLink oder Gigabit Ethernet* |
| *Lens* | *12 mm, 25 mm, 50 mm, 100 mm, G1-G5* |



***Crack in a piston***



***Gear wheel with cracks***

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