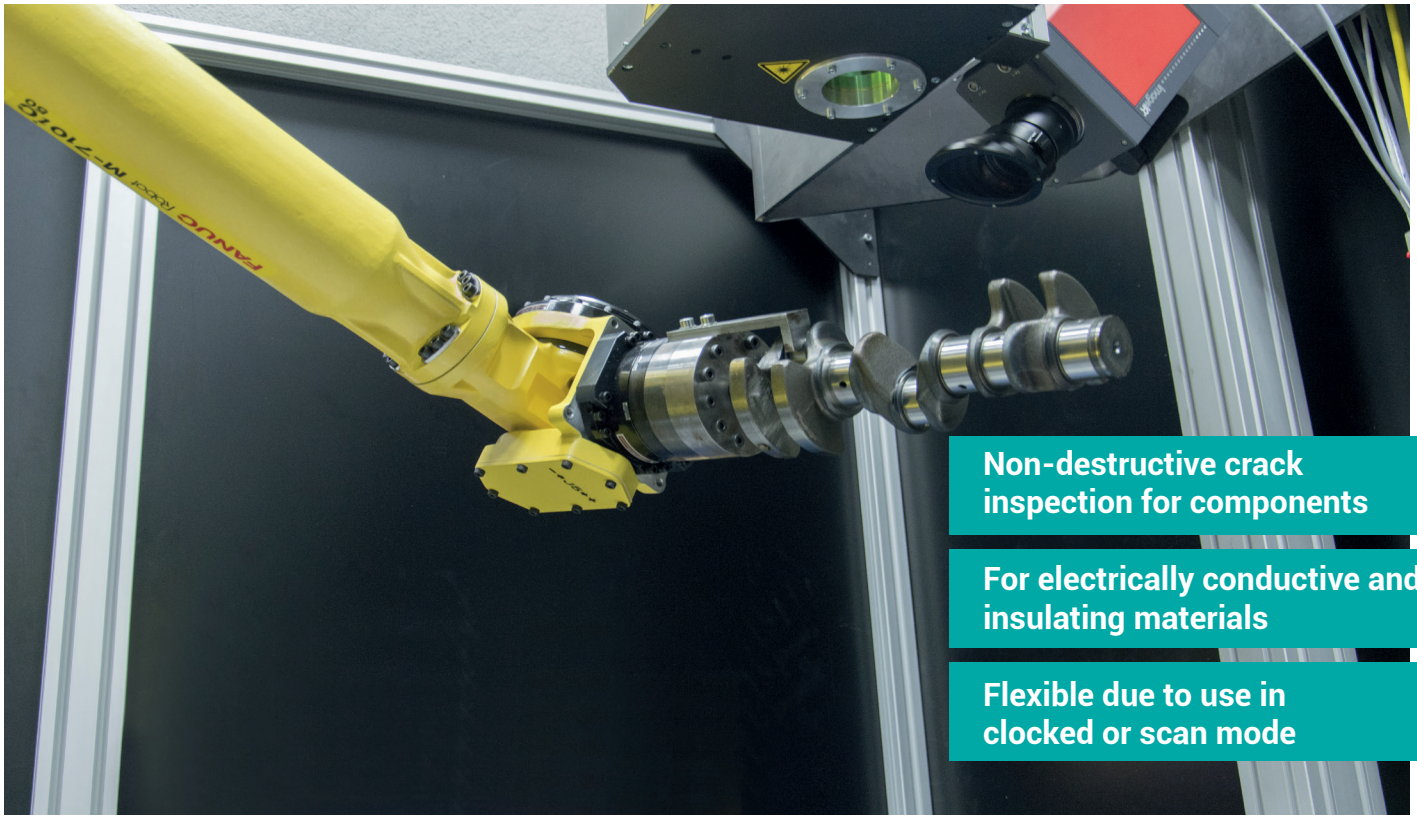
Industrial Thermography

Quality control through non-destructive crack detection



Invisible defects close to the surface can also have a serious effect on the strength or service life of components.

Such cracks or structural defects tend to occur in highly optimised manufacturing processes (e.g. casting, deep drawing, welding).

Industrial thermography can also detect cracks close to the surface.

- Cracks and structural defects influence the heat flow in the material. By inspecting the distribution of heat over time, it is possible to infer material quality just below the surface.
- Heat flow thermography is a non-contact, non-destructive technology used to detect closed and invisible defects.
- Special algorithms can be used to implement automated industrial control systems that enable continuous or clocked product inspection.

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Use cases

- Detection of cracks, voids, inclusions and local inhomogeneities
- Inspection of both electrically conductive and insulating materials
- Determination of joining quality (welding, bonding)
- Control of delamination and adhesion
- Thickness measurement of coatings
- Temperature distribution (temporal and spatial resolution)
- Thermal diffusivity (spatial resolution)

Many years of experience in industrial use

Industrial thermography is an extremely flexible and scalable technology for quality control. PROFACTOR has been implementing international projects for automated inspection systems for many years - from piece goods in component manufacturing to long materials weighing several tons in the metal industry.

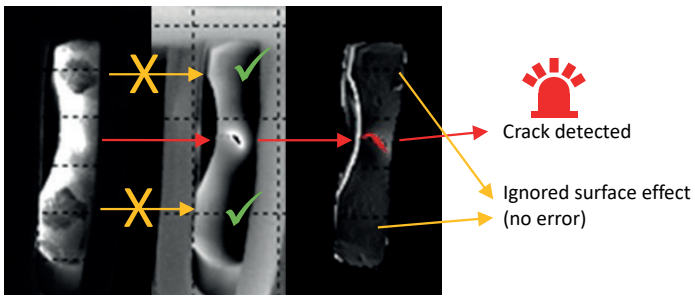
Talk to us. We're happy to support you and your application with our technology and many years of experience.

Heat flow thermography for non-destructive quality control

Automated crack inspection with inductive excitation

An electric current flow is inductively generated in an electrically conductive component. If a defect disrupts the current flow, the material at the point of disruption heats up disproportionately.

The resulting inhomogeneous surface temperature can be measured automatically by a thermal camera. Special evaluation methods suppress unwanted surface effects and provide detailed and precise information on the location of the crack.

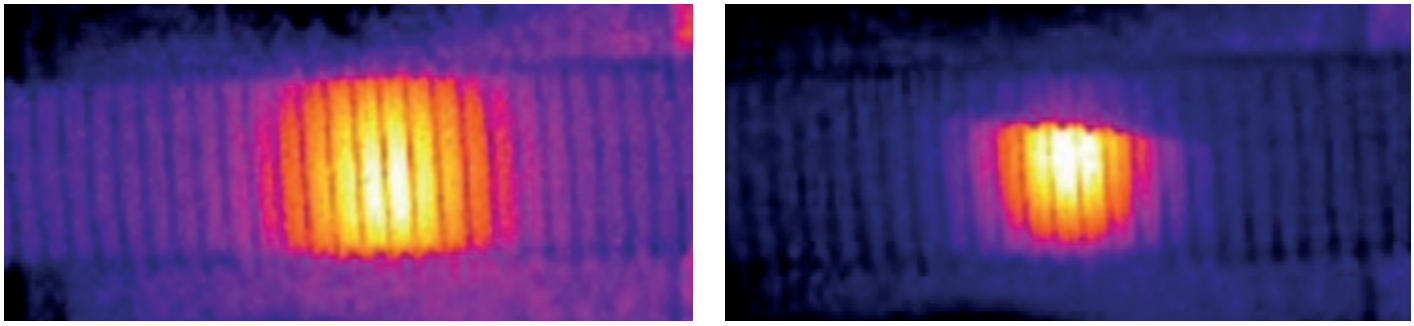


Evaluation algorithm accurately suppresses pseudo effects.

Automated crack detection with laser excitation

Thermographic crack detection can be used for all electrically conductive and insulating materials by using laser excitation. Here, a laser beam is passed over the component and the development of the surface temperature over time is recorded by a camera.

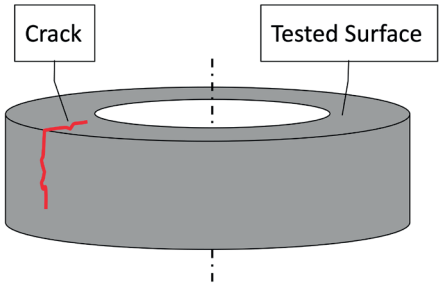
Defects and structural flaws below the surface lead to measurable temperature differences due to local differences in heat propagation, which can be precisely localised using thermography.



Threaded rod after laser heating, without crack on left, crack on right clearly identifiable.

Industrial application example

A cylindrical component for the automotive industry may have cracks that are partially closed and often not visible even with a microscope. In the automated inspection system, the rotating component is scanned by laser. Based on the thermal image sequences, an overall image is generated from this, which highlights any cracks.



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