

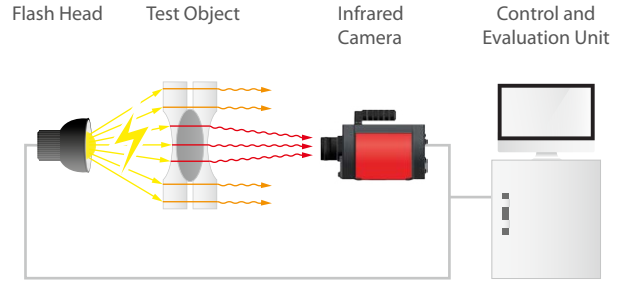
## Automated Testing System WELD-CHECK



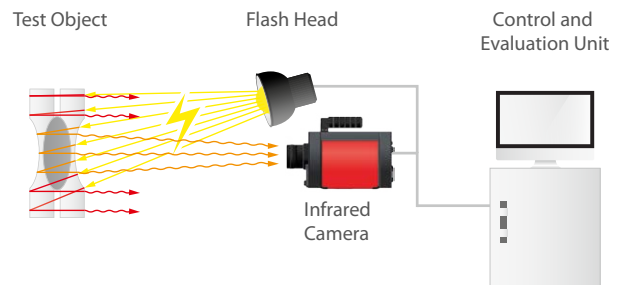
Thermography-Based Testing of Welded Joints

WELD-CHECK for testing welded connections serves as an ideal system for automotive car body manufacturing. It is based on the principle of active heat flow thermography with impulse excitation and can be operated as an offline measuring cell as well as an inline testing station. The corresponding component is excited with an optical high performance flash for the test. Thermographic cameras record the resulting chronological sequence of the heat propagation on the surface of the component with the welded connection. The two flash heads of the system allow the selective recording of thermal image sequences in transmissive or reflexive order.

After starting the component testing and entering the component detection, the thermographic measurements start automatically. WELD-CHECK evaluates the thermal images of the welded connections automatically in parallel with the further recording. On request, a visual evaluation is also possible, which can be carried out decoupled from the recording process immediately or later by the tester.



Transmissive order



Reflexive order

### WELD-CHECK Testing System at a Glance

#### Used in a variety of applications

- Testing laser-welded seams or resistance welding points by means of heat flow thermography

#### Efficiency enhancement

- Completely automatic inspection system with measurement times of a few seconds per welding point

#### Defect detection

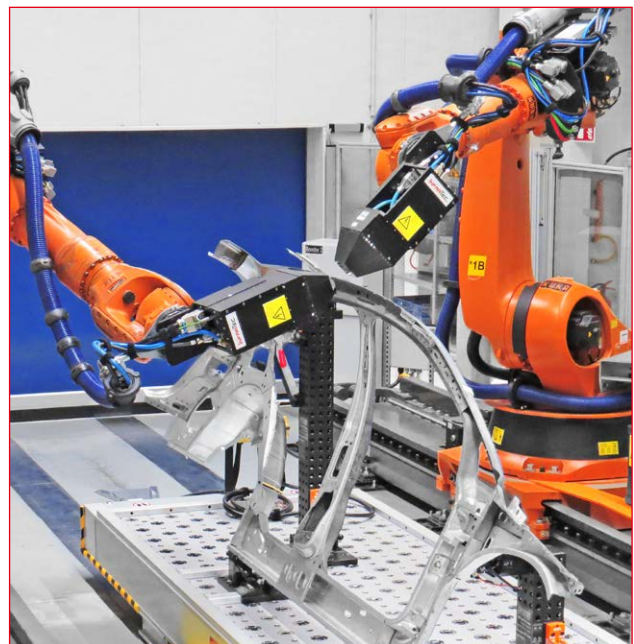
- High level of test reliability by means of analysis with extensively configurable software algorithms

#### Quality documentation

- Integration into the local quality management through direct preparation of measurement protocols and links to databases

#### Process monitoring

- Detection and classification of various defect types for early detection of deviations in the joining process



Automated testing system



## Automated Testing System WELD-CHECK

### Thermography-Based Testing of Welded Joints

#### Testing Software

The WELD-CHECK testing software has a modular structure and operates with database support during component testing.

##### Important functions

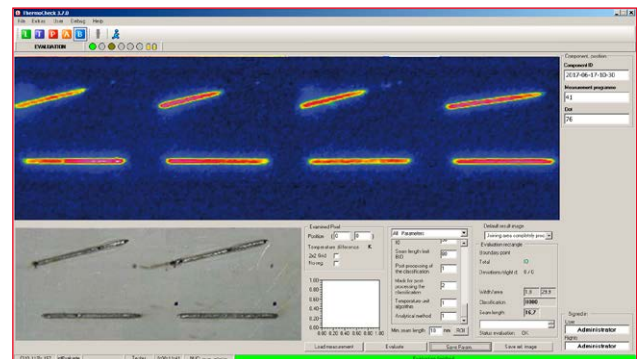
- Recording the components to be tested
- Automatic evaluation of the thermal images immediately after completion of recording and simultaneously during the implementation of further recordings
- Automatic or visual evaluation of all test positions
- Generating a test report and entering the results in a quality database

##### Your benefits when using the WELD-CHECK testing software

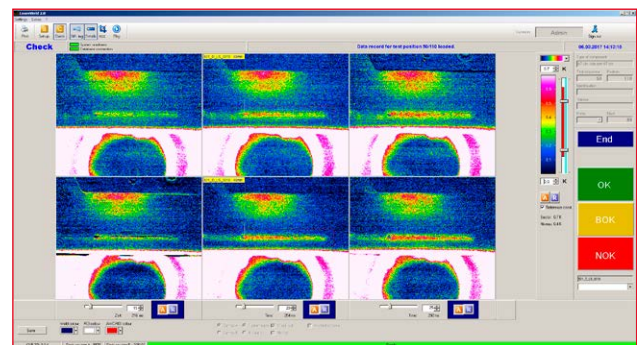
- Various operating modes for teach-in, testing and offline analysis
- Displaying of all information in test mode with live image, difference image, evaluation image and reference image
- Extensive presentation of results
- Offline mode for the parameterisation and evaluation of large data sets
- Flexible integration into the local system architecture via universal interfaces and bus systems

##### Evaluation algorithms

- Precise and high-resolution recording of the temperature profile
- Automatic detection of the welding points by means of the temporal and local heat dispersion
- Independence from the absolute material temperature by evaluation of temperature differences and temperature relations
- Efficient filter-algorithms for the suppression of production-related interferences and deviations
- Integrated positioning and sizing as well as comparison of predefined threshold values



Inspection of laser welding seams with automatic evaluation



User interface for set-up mode and manual evaluation

#### Hardware

##### High-end thermographic camera ImageIR® from InfraTec

- Temperature resolution: Up to < 15 mK @ 30 °C
- Frame rate: Up to 450 Hz (full-frame) / 25 kHz (sub-frame)

##### High-performance flash with efficient cooling

- Maximum flash power of up to 6,000 J

##### Control and evaluation unit in 19" control cabinet

- Industrial PC for testing software and system control
- Integrated control and cooling unit for flash



Camera/flash head combination from InfraTec