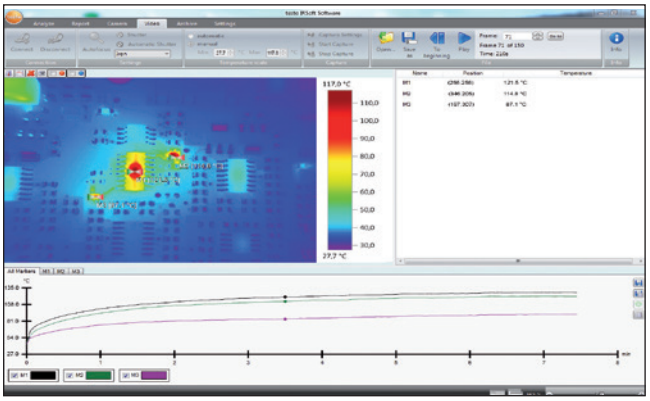
We measure it. testo

Sequence capturing of infrared images in Research and Development.

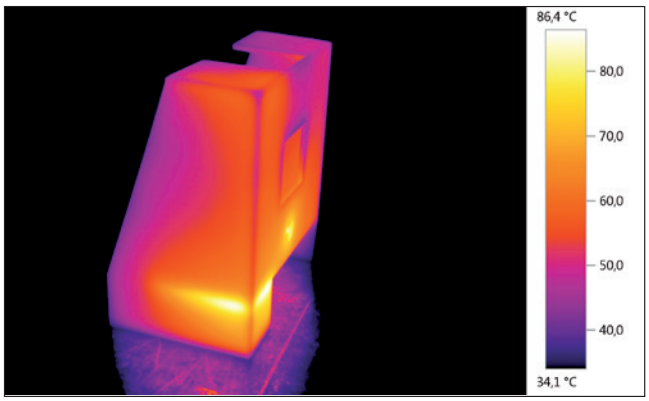
Thermography in Research and Development.
The main task for the R&D department is to accelerate the development times of new products without making compromises regarding quality and safety in the process. For this purpose, important process steps must be precisely monitored and analyzed in order to constantly optimise them. However, potential sources of error are not always easy to identify which means a detailed analysis of the product or specific components is indispensable. Thermal processes are especially relevant for this.

Thermography can provide support with this, particularly in the following applications:

- Design of temperature control systems (cooling down or heating up)
- Support for required R&D documentation using infrared images
- Thermal load and utilisation rate of electrical components
- Specification and verification of technical limit values/ parameters
- Long-term tests and thermal visualisation of weak spots
- Component optimisation for mechanical loads (e.g. friction).



Presentation of the heating process of several processors on a circuit board in a temperature-time diagram in IRSoft.



Plastic component with abnormal heat distribution in the lower part. This can be traced to insufficient cooling of a core part in the injection moulding machine tool.

The challenge.
Thermal effects can be shown on the surface through thermal images. Static thermal images do indeed provide an insight into heat distribution, but it is only an observation of temperature developments as a time progression which really allows all anomalies to be detected. In R&D, it is crucial to know exactly where and when to look in this process in order to detect an anomaly. If, for example, temperature-sensitive components are installed adjacent to ones which develop a lot of heat, there is a latent danger of heat transfer – the desired function of an individual component or the complete product would be endangered. And finally, detailed observations of temperature developments usually generate very large quantities of data, of which often only a fraction is relevant. Despite this, all data have to be examined conscientiously, in order to really be able to detect all anomalies. A great deal of time is therefore lost searching – time which could certainly be better spent elsewhere.

The solution:

Record infrared images as a sequence.

If the development of temperatures needs to be observed over time, sequence capturing enables the recording of a sequence from a series of images. This means you obtain radiometric image sequences which allow you to evaluate the temperature in the thermal image for every time in the measuring process and at every position of the measurement object. This avoids time-consuming searching. The recording is made at individually configurable intervals, and can be started manually or after a timer countdown. After finishing the measurement, you can examine and analyze the recorded sequences easily on a PC in the IRSoft professional analysis software.

If required, an automatic limit-based trigger allows thermal images not to be recorded until a defined thermal limit value is reached. In particular, the “region of interest” trigger enables an adjustable trigger region to be defined. This means that only relevant components are examined. Irrelevant temperature developments in other regions are ignored in this process. This function has the further advantage that data are only recorded which are really relevant for the development of the product.

Viewing of unnecessary measurement data can be dispensed with, resulting in further time savings. The required shutter procedure (adjustment) for the thermal imager can be synchronised with the capturing interval, so that the adjustment procedure always occurs between the capturing of IR images.

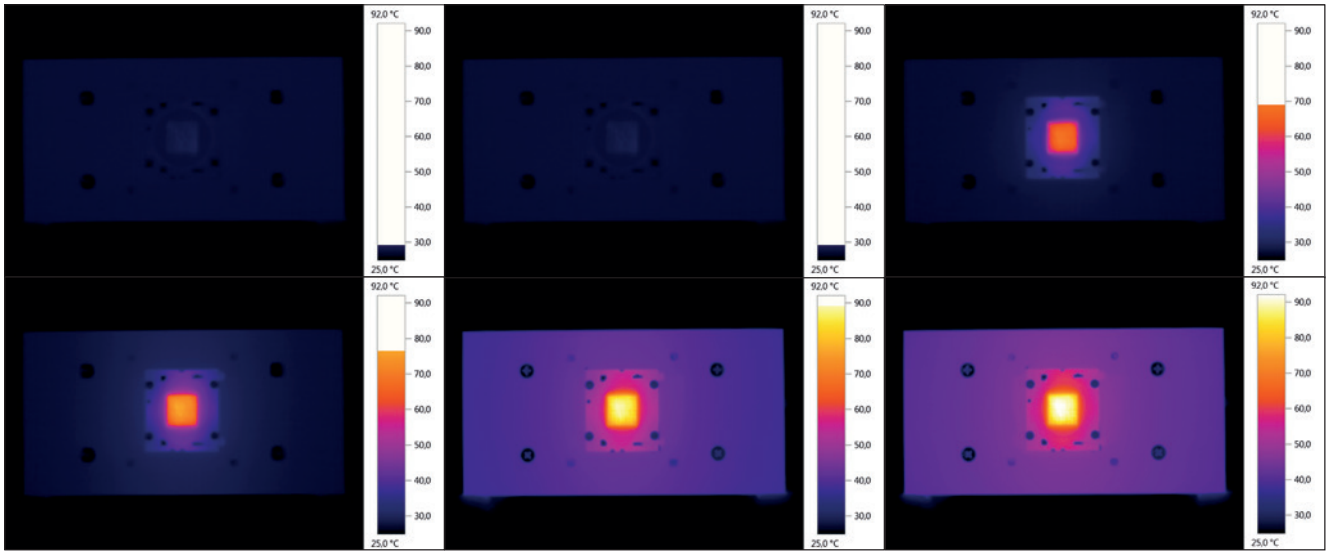


Image sequence recording of an LED on a heat sink. Sequence capturing visualises temperature development quickly and easily as a time progression.

Advantages of sequence capturing.

- Fast trial setup without laptop and cabling
- Flexible to use because sequences are captured in the instrument
- Recording of temperature processes over a long period of time with adjustable intervals (smallest interval 3 secs.)
- Reduction to the relevant data using the trigger options
- Fast and professional subsequent analysis using IRSoft professional software.

For fast processes:
fully radiometric video measurement.

If there is a need to accommodate a comprehensive trial setup when working with the thermal imager, the imager can also be connected to a PC via a USB interface and the IRSoft function's fully radiometric video streaming used. A recording speed of up to 25 Hz is achieved in this process. In order to evaluate temperature developments as a time progression, measurement points and profile lines can be presented as a temperature-time diagram and then exported as a graph or Excel file.
The new process analysis package is available for both professional thermal imagers, testo 885 and testo 890. Along with their resolution of 320 x 240 pixels (testo 885) or 640 x 480 pixels (testo 890), this is the ideal combination for thermal analyses in Research and Development. The process analysis package is available for both thermal imagers as an upgrade option.

More information.

For more information on using the testo 890 thermal imager in R&D and all answers to questions concerning thermography contact our local representatives. Find your contact person here: www.testo.com