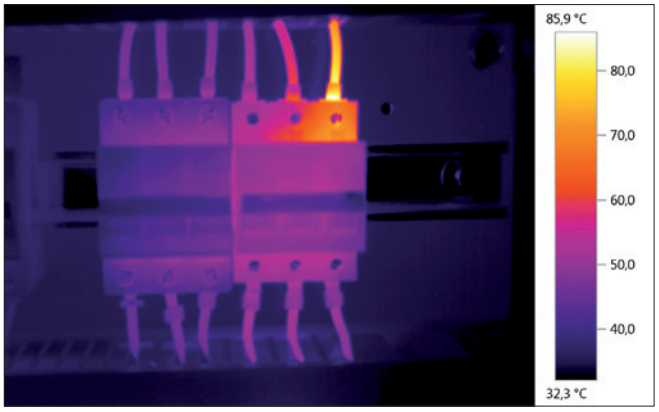
We measure it. testo

Sequence capturing of infrared images in production and maintenance.

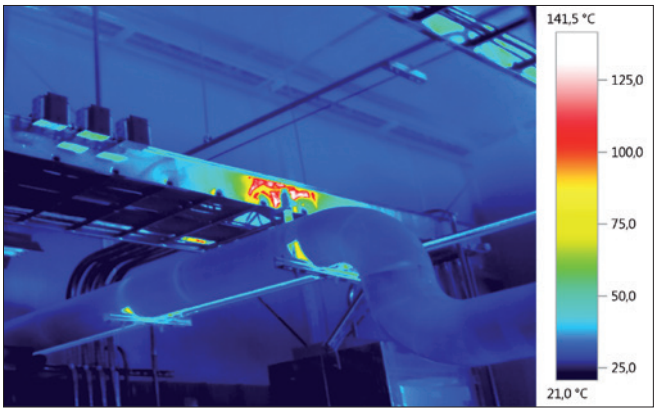
Thermography in production and maintenance.
Industrial plants which operate around the clock are expected to enjoy failure-free and smooth operation. System downtimes can have far-reaching consequences – from production shortages and damaged customer relations due to delivery bottlenecks right through to endangering safety at work. For this reason, plants must be continuously monitored.

In addition the amount of energy consumed is also of growing significance: plants which are not optimally maintained can cause an increase in energy consumption, leading to an undesired increase in costs. Reactive maintenance is one possible way of ensuring proper functional capability and efficient operation. However, this method is not recommended, as it is only applied when a problem has already occurred and a plant breakdown is imminent.

Neither can preventive maintenance optimally guarantee system availability, as the machines need to be switched off and serviced according to a plan, although there may actually not have been any necessity for doing so. In order to optimise system reliability and product quality, and to reduce downtimes and energy costs, industrial systems must be serviced according to their condition. Only this can ensure that irregularities are identified early, and maintenance measures planned and conducted optimally.



Overheated clamp connection in a switching cabinet.

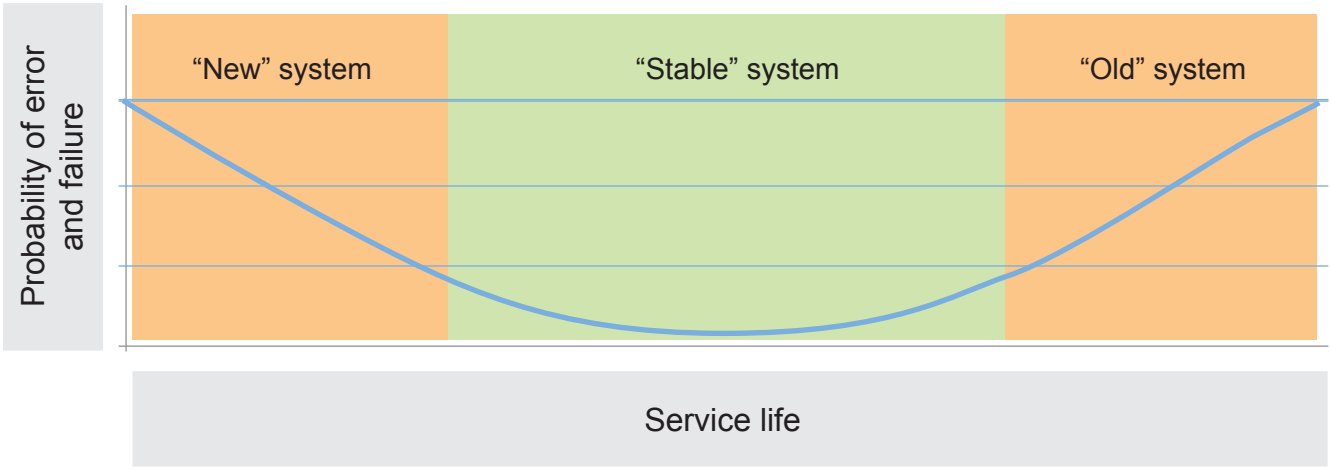


The overheating bearing in a conveyor is clearly visible.

The challenge.

Under stable production and load conditions, individual thermal images are normally sufficient to provide an insight into the machines and systems using these static thermal images. These transient images are not however sufficient if the system load depends on changing environmental factors. For example, different load conditions can lead to thermal developments not yet being critical at the time of the measurement. Particularly in the summer months, it is not unusual for systems to heat up more, because the cooling or ventilation is insufficient. Different production-related load conditions over the course of a day can also lead to a measurement being taken at the “wrong” time - or the system load not being identified.

Also when commissioning new systems whose “thermal behaviour” is not yet known, thermal development should be observed over a longer period of time. Amongst other things, warranty or rectification claims can be made in good time as a result. The probability of error and failure increases specifically with older systems due to wear and ageing.



Schematic representation of a system's probability of error and failure.

The solution:

Record infrared images as a sequence.

Since imminent anomalies in electrical or mechanical systems are usually indicated by temperature increases, it is important in condition-oriented maintenance to be able to record not only static images, but also temperature developments as a time progression. This is precisely what is enabled by image sequence capturing. The user-defined intervals are recorded directly as image sequences in the imager. This allows temperatures to be analyzed as a time progression. The recording can be started either manually or after a timer countdown. The image sequences can easily be transferred to a temperature-time diagram. This enables conclusions to be drawn about the behaviour of the systems under maximum load even during continuing normal operation. As the image sequences are recorded directly in the imager, it is no longer necessary to carry out the recordings in combination with a PC or laptop. This means you do not need to carry unnecessary loads with you, and you can get an overview of the condition of your systems on site quickly and directly. For efficient plant maintenance, it is often important not to monitor temperature developments

until a defined limit value is reached. For this reason, sequence capturing has an automatic, limit value-based trigger which only initiates the thermal imager‘s recording when a defined limit value is reached. This function also has the advantage that only data which are actually needed are collected, which means that time-consuming viewing of large quantities of data is avoided. The settings required to activate image sequence capturing can be intuitively carried out with the help of a wizard integrated into the imager.

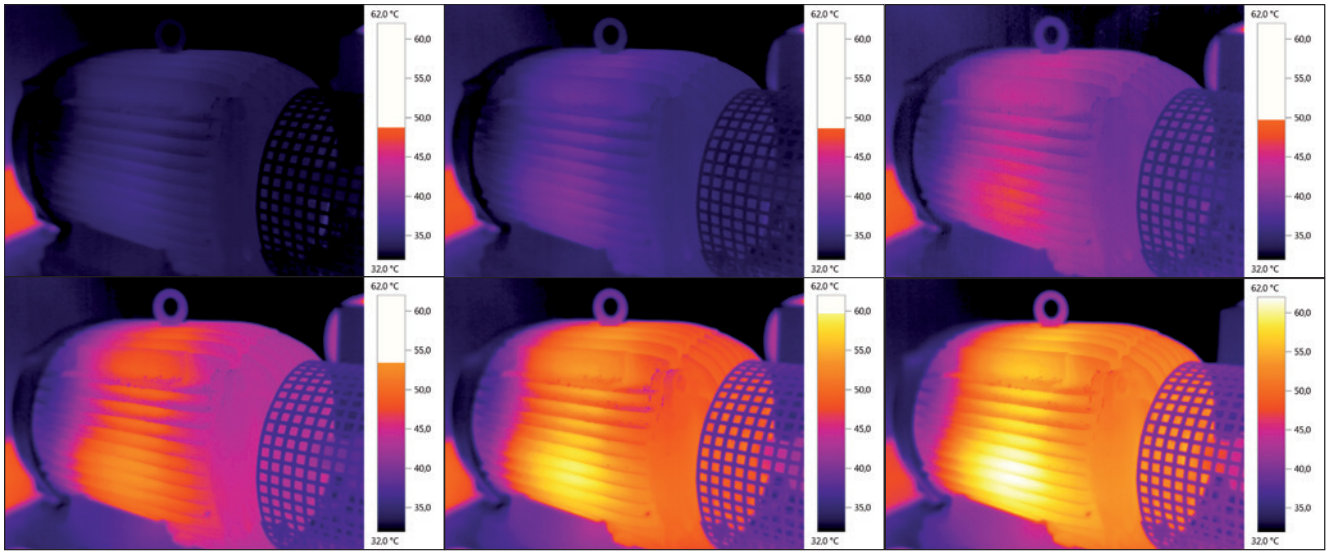


Image sequence recording of a motor under load. Sequence capturing visualises heat distribution as a time progression.

Advantages of sequence capturing.

- Fast setup on site at the plant without laptop or cabling
- Flexible to use because sequences are captured in the instrument
- Recording of temperature increases over a long period of time with adjustable intervals (smallest interval 3 secs.)
- Reduction to the relevant data using the “trigger” option
- Fast and professional subsequent analysis using IRSoft professional software

Sequence capturing is a component of the new process analysis package and is available for both professional thermal imagers, testo 885 and testo 890. In particular, the testo 885 is ideally suited to use in maintenance with its resolution of 320 x 240 pixels.

More information.

For more information about using the testo 885 thermal imager in maintenance and all answers to questions concerning thermography contact our local representatives. Find your contact person here: www.testo.com