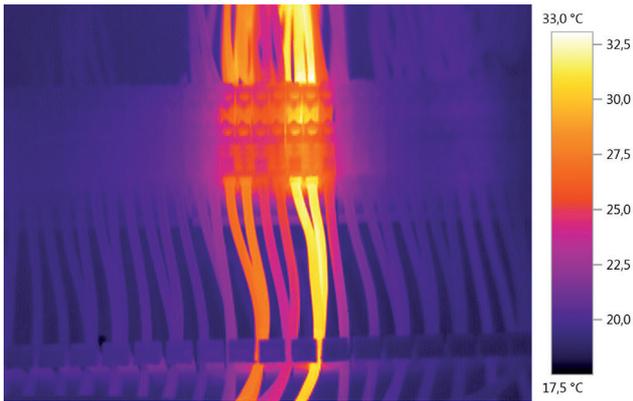


**Detect anomalies promptly,
carry out inspections more efficiently,
increase system availability.
Use thermography.**

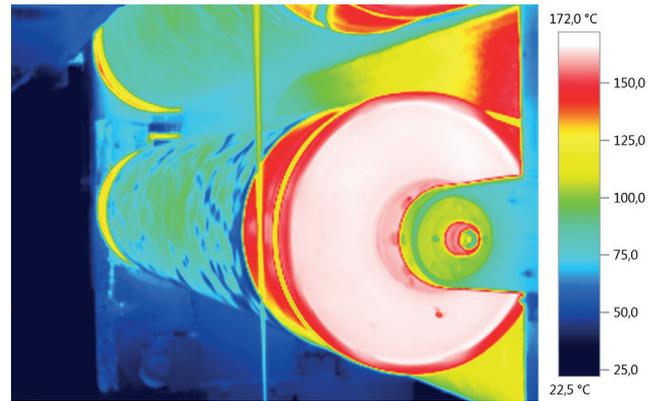


In the global competition for market shares, companies depend on efficient manufacturing processes and machines that run reliably. Service engineers play a key role in this: they bear the responsibility for ensuring the permanent availability of production facilities. To them, thermography is a valuable diagnostic tool.

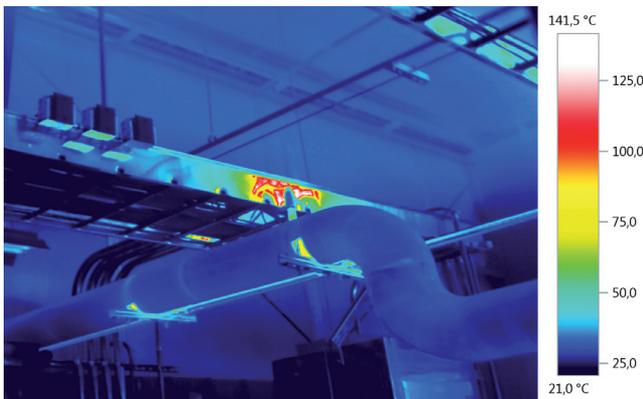
Problems with electrical and mechanical installations usually become evident at an early stage due to thermal irregularities. Thermal imagers visualise status changes and weak spots – and they do this in a non-contact, non-destructive manner. The next few pages outline how thermal imagers from Testo can help you to perform typical preventive maintenance tasks more reliably, easily and safely.



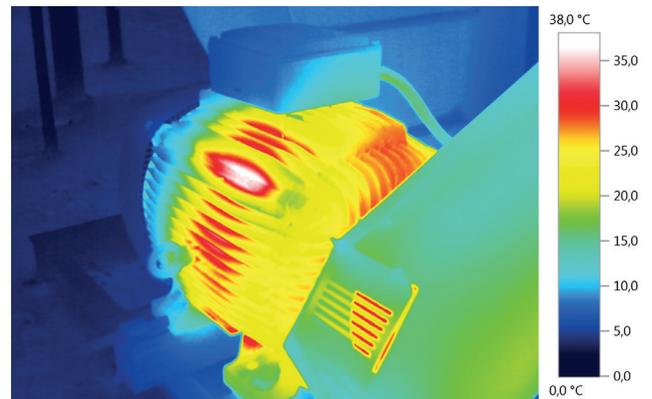
Overheated clamp connection in a switching cabinet.



Temperature development in a plant in plastics production.



The overheating bearing in a conveyor line is clearly visible.



Checking a motor for anomalies.

The challenge.

Maintenance was previously considered to be purely a tool for rectifying faults. These days, it is seen as a preventive maintenance service which ensures the permanent availability of production facilities and plays a vital role in the competitiveness of industrial companies. Every day, specialist personnel are at the forefront of the struggle to minimise downtimes, prevent damage to mechanical and electrical components, fully exploit the level of equipment utilisation, and as a result also reduce maintenance costs. Since production usually focuses on a small number of machines or automated systems, when these are shut down this often has far-reaching consequences: one leaky valve can spoil the entire batch, a machine fire could end up jeopardising your company's million euro contract, or your company's fire insurance may threaten higher premiums as an additional penalty. Large-scale damage may result in the plant shutting down. One out of three fires in industrial companies can be attributed to electrical components overheating, with minor defects such as loose terminals or damaged cables often the cause.

Fault-free plant status also guarantees safety in the workplace. There is additional pressure from national and international legislation, as well as the standards of employers' liability insurance associations or trade associations. These are all in place for your own safety, since work-related accidents are more likely to occur in maintenance than in production, despite the lower number of employees. Lastly, all inspections need to be documented, and your supervisor expects a complete, technically accurate report. Thermography is a safe, efficient and simple measuring technique for these typical industrial tasks.

The solution.

Thermal imagers convert thermal radiation in the infrared range into electrical signals and make them visible. This extension of the range and function of human vision by means of the thermal image is akin to a sixth sense, which service engineers can use to detect concealed defects and anomalies before they turn into proper malfunctions and endanger system availability.

Versatile and flexible

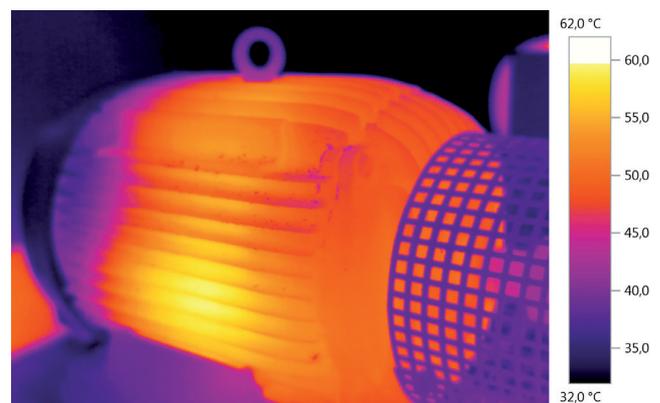
In electrical installations, thermographic measurement methods are possible at all voltage levels. This means that entire switch cabinets, not to mention medium, high and ultra-high voltage installations, can be inspected efficiently and in compliance with the necessary safety clearance. Carrying out thermographic inspection for just a second time reduces a system's rate of failure by 80 % and provides an added safeguard against fire. Even before damage occurs, the thermal image provides information about the operating status of mechanical assemblies. Motors, gears, couplings or bearings can be examined individually or as a functional unit. Thermal imagers can be used for precise temperature measurements even on complex aggregates, containers for liquids and gases, turbines or filters. You can use thermography to inspect insulation, and also to detect internal deposits in pipelines and containers.

Safe and non-contact

A thermal imager can be used to examine live components or moving parts from a safe distance. This means that thermography can be used to monitor even difficult-to-access areas safely and accurately. This increases occupational safety and allows inspections which were previously only possible through investing considerable effort – by shutting down machines or disconnecting electrical installations. The examination also reveals the thermal behaviour under full load. Problematic areas are clearly indicated on a display. This allows the on-site service engineer to detect and eliminate sources of error at the very moment that these crop up. Using a pyrometer could cause the service engineer to miss these crucial details. In addition, thermograms facilitate clear error documentation and long-term time series comparison of system status. The software can be used to analyse the images quickly and easily, and summarise all work in a report. This reduces tedious paperwork.

Place your trust in the global market leader

Testo is one of the world's leading manufacturers of portable, innovative measuring instruments and thermal imagers. With an infrared resolution of 320 × 240 pixels, the **testo 883** professional thermal imager is the flagship instrument for universal applications. The **testo 890** high-end system's 640 × 480 pixel detector will satisfy even the most demanding of requirements.



Two infrared images of the heat development of a motor under load.

Most associations recommend detector sizes of at least 320 × 240 pixels for applications in industrial thermography. **testo SuperResolution** improves the quality of each recorded infrared image, making it a cut above the rest: the patented technology produces four times as many readings and a usable geometric resolution that is 1.6 times higher. **testo SiteRecognition** facilitates repeated thermal imaging of similar measurement objects: The function's immediate measuring location detection and automatic thermal image assignment enable efficient inspection route management. The ergonomic design and extra features such as the lens protection glass ensure safe handling in tough industrial environments.



Key advantages of thermography

- Safety during measurement, precision and reliability of measurement results
- Visualise load changes over the course of time, preventing system breakdowns
- Cost and time efficiency

More information.

For more information and answers to all your questions about thermography in preventive maintenance at www.testo.com.



testo 883 thermal imager