

Thermographic surveys

Many property fires are caused by electrical faults, often in relatively mundane circuits such as lighting and heating. Thermographic surveys can detect electrical and mechanical components that are operating at excessive temperatures, one of the warning signs of likely failure.



Fixed wire testing is recommended to meet UK statutory requirements and reduce the risk of failures that lead to fires (see separate QBE technical guidance). But, there can be many years between tests and elements of the testing have to be undertaken with the circuit off load when some of the faults would not be evident. Thermography is an important complement to fixed wire testing. It can be undertaken while production continues and gives a rapid health check of key electrical circuits.

A thermographic camera works by measuring the wavelength of radiation an object emits. The wavelength is directly proportional to the surface temperature, which allows the camera to create an image of the object's temperature profile.

Benefits of thermography

Thermography has a number of advantages when used as part of a preventative maintenance system

- It can be used on electrical, control and mechanical systems
- It is undertaken while equipment is operating under normal load
- It is relatively quick and inexpensive.

Faults can develop between fixed wiring test intervals that undetected could result in a fire. These faults can be caused by ageing or environmental factors such as airborne contamination. Thermographic surveys frequently identify faults that have developed within the previous 12 months.

Conducting a thermographic survey

To conduct a thermographic survey, the camera must have line of sight of the components being scanned. As this can mean opening electrical cabinets, the work should always be undertaken by competent persons working to a safe system of work.

There are internationally recognised standards that provide guidance on undertaking thermographic surveys and the minimum competence levels required.

- EN 473 and EN 54190
- NFPA 70: Section 6.3, chapter 20.17, Annex I and H
- VdS 2858, 2859, 2860 and 2861.

In the UK, the minimum standard to demonstrate competence in thermographic survey work is training to level 1 BS EN 473:2000.

Faults that can be identified by thermographic inspection

- Loose, corroded or faulty electrical connections that lead to increased resistance and heat
- Overloading of circuits and fuses
- Hot spots in high level lighting (scanned from floor)
- Overheating bearings. A common ignition source with conveyors
- Defective refractory linings in furnaces and kilns
- Thermal insulation failures.

Case study

The most likely cause of a fire that destroyed a warehouse was a faulty junction box on a lighting circuit. The junction box was clipped to combustible material and a loose connection led to it overheating, igniting the combustible material.

Case study

The hardwired switch to an electrical heater in an office was found to be overheating on a thermographic survey. The increased resistance had been caused by the unit having been repeatedly turned off at the mains switch while under load. This leads to arcing across the metal contacts, eventually degrading them causing increased resistance and heat. Without maintenance intervention this could have caused a serious fire.

Many sites have introduced annual thermographic surveys after a fire. At QBE, we would recommend taking this step as part of a preventative maintenance programme before an incident occurs.

For further guidance and general enquiries contact RS@uk.qbe.com.