

Fact sheet

# Thermographic Scans

Faulty electrical equipment is a major source of fires in business. Regular thermographic scans can be an effective, low-cost control for preventing fires and major shutdowns caused by faulty electrical equipment and machinery in your business.

## What is a thermographic scan?

A thermographic scan uses an infrared camera to record the temperature distribution on the surface of a piece of equipment. They are used on electrical distribution boards (or switchboards), machine bearings or other heat-producing equipment.

Thermographic scans are generally used to assess the following types of equipment:

- Bus ducts and cable runs
- Main switch and distribution boards
- Private substation equipment
- Motors and motor control panels
- Conveyor bearings
- Refractory linings in furnaces and kilns
- Other business critical plant and equipment.

*Faulty electrical equipment is a major source of fires in businesses. A study in the USA found that 21% of industrial fires originated in electrical transformers, power supplies, wiring and related equipment.<sup>1</sup>*

## Detecting hot spots

A thermographic scan can detect “hot spots” (raised temperature) relative to:

- the surrounding surface / components
- a similar piece of equipment operating under similar conditions, or
- a past thermographic scan of the same piece of equipment.

Any hot spots represent potential faults (now or in the future). Trained professionals can analyse and prioritise those faults for investigation in accordance with industry standards.<sup>2</sup>

## Benefits of thermographic scans

Although conducting regular thermographic scans are a cost to your business, the benefits can be substantial:

- Reduce the risk of electrical or mechanical faults occurring, leading to fire or major breakdown
- Reduce risk of personal harm to staff and customers from fire or electrical shock
- Reduce costs of unscheduled maintenance and shutdowns
- Reduce repair costs by fixing a fault before major failure
- Help manage the risks to your business or property.

## What should be scanned?

Thermographic scans of the main electrical switch and electrical distribution boards are most common. Scanning can also be performed on key pieces of machinery, such as conveyor bearings.

Contributing factors that indicate the need for a scan of electrical equipment include:

- Main switch or distribution boards featuring ageing or outdated components such as fuses, or located in dusty or corrosive environments
- Electrical equipment mounted on or near combustible material, or in open cabinets
- Circuits loaded close to their maximum, e.g. new equipment installed on existing circuits.

## How often should you get scans done?

Regular scans can form an important part of an effective preventative maintenance regime as they provide a record of the temperature changes over time.

In addition, ad hoc scans are also beneficial before and after any major system upgrades, especially when new equipment significantly increases the load on electrical circuits. Such scans can assist in making sure that equipment continues to operate within normal bounds after the upgrade. They also help verify that the upgrade has been completed correctly.



QBE may ask you to conduct regular thermographic scanning as part of your preventative maintenance regime and to demonstrate good management practices.

You can determine an appropriate thermographic scanning schedule, and the need for ad hoc scans, in consultation with a qualified thermal scanning professional.

### Accredited professional

Scans must be carried out by a person trained in:

- the use of a thermographic camera
- analysis of scans, and
- reporting and recommending corrective actions.

Thermographic scanning professionals can be accredited to Level I, II or III (with level III being the highest level of accreditation), issued by the Australian Institute for Non-Destructive Testing (AINDT) or by the British Institute of Non-Destructive Testing (BINDT).

ISO 18436.7<sup>3</sup> specifies the requirements for qualification and assessment of personnel who perform machinery condition monitoring and diagnostics using infrared thermography.

When engaging a thermographic scanning professional it is a good idea to:

- request a copy of their infrared thermography certifications and check whether they are a level I, II or III certified operator
- check their training and experience and be satisfied with their credentials.

Scans should be completed under full load and all components should be open and uncovered during the scan.

- Any written report should include:
  - thermal images of the equipment
  - details and summary of findings, including temperature differences detected
  - recommended actions including the priority of repairs

Note: If you are a tenant, your property owner may already be commissioning scans to manage their risks, so ask your landlord for a copy of their reports.

**Want to know more?** If you have any further questions please contact your risk consultant or QBE Australia Risk Solutions at [surveys.risksolutions.anzo@qbe.com](mailto:surveys.risksolutions.anzo@qbe.com)

This guide was compiled based on information available to QBE on or before March 2020. The general advice in this factsheet has been prepared without taking into account your objectives, financial situation or needs. You must decide whether or not it is appropriate, in light of your own circumstances, to act on this advice. This guide does not form part of any insurance policy and is not used in the assessment of insurance claims. Any insurance claim will be assessed against the policy terms and conditions and applicable law.

1. Richard Campbell, Fires in Industrial and Manufacturing Properties, USA, National Fire Protection Association, March 2018

2. Standard for Infrared Inspection of Electrical Systems & Rotating Equipment, N.J., Infraspection Institute, 2016

3. ISO 18436.7 - "Condition monitoring and diagnostics of machines - Requirements for qualification and assessment of personnel - Part - 7: Thermography," ISO Publishing, 2014 (2nd Edition)