



## Infrared Thermography

Thermography is a non contact and non destructive inspection technique that provides immediate results and cost savings to clients. Its applications are almost limitless for most industry types. It is easy to see a problem, but what is important is to interpret the results. In addition, the high capital cost of the equipment can make one-off requirements uneconomical. Using VELOSI is a cost effective way to ensure that the inspection is carried out by qualified and experienced personnel at a reasonable cost, using the most up-to-date equipment available.

*“Nearly everything gets hot before it fails”.*

Thermography is the use of infrared imaging technology and a measurement camera to ‘see’ and ‘measure’ thermal energy emitted from an object. Thermal, or infrared (IR) energy, is light that is not visible because its wavelength is too long to be detected by the human eye; it’s the part of the electromagnetic spectrum that we perceive as heat. Unlike visible light, in the IR world, everything with a temperature above absolute zero emits heat. Even very cold objects, like ice cubes, emit infrared.

The higher the object’s temperature, the greater the IR radiation emitted. IR thermography cameras produce ‘heat’ radiation images and precise non-contact temperature measurement capabilities.

High definition thermographic cameras have migrated into other fields as varied as engineering, medicine and archaeology. More recently, price reductions have helped fuel the adoption of IR viewing technology. Advanced optics and sophisticated software interfaces continue to enhance the versatility of this diagnostic tool. As the industry strives to improve manufacturing efficiencies, manage energy, improve product quality, and enhance worker safety, new applications for IR cameras continually emerge.

In modern applications, equipment failures are usually preceded by an abnormal temperature pattern, and this temperature rise can be easily detected by an IR thermographic inspection. The advantages are that it can reduce unplanned down-time, maintenance costs, and also improve production, equipment life and plant safety.

One advantage of this technique is the ability to detect faults in time without plant shutdown.

## The most common applications:

- **Predictive Maintenance** (early failure warning) **on Mechanical and Electrical Equipment**
  - Overheated motors
  - Overloaded pumps
  - Hot bearings
  - Axels
  - Oxidization of connections
  - Corrosion
  - Overheated/poor connections
  - Internal faults
- **Process Monitoring**
  - Steam traps
  - Blocked pipework
  - Insulation breakdown or defect
  - Level detection
  - Industrial chimneys/furnaces
- **Condition Monitoring and Surveillance**
- **Automotive Applications**
- **Energy auditing of insulation** (heating and cooling losses)
- **Building Construction**
  - Roof inspection
  - Masonry wall structural analysis
  - Moisture detection in walls and roofs
  - Glassing installation errors
  - Hot spots due to bad insulation
  - Underfloor heating problems
- **Quality control in production environments**
  - Mould inspections
  - Safety alarms in process measurement
- **Research and Development of New products**
  - Robot operations

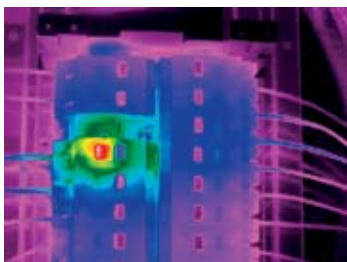
## Temp measurement

Finding a problem with an IR camera is sometimes not enough. In fact, an IR camera image alone without accurate temperature measurements reveals very little about the condition of an electrical connection or worn mechanical part. Many electrical targets are operating properly at temperatures that are significantly above ambient.

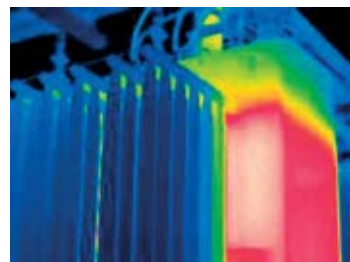
An IR image without measurement can be misleading because it may visually suggest a problem that does not exist. IR cameras that incorporate temperature measurement allow predictive maintenance professionals to make informed judgments about the operating condition of electrical and mechanical targets.

Temperature measurements can be compared with historical operating temperatures, or with IR readings of similar equipment at the same time, to determine if a significant temperature rise will compromise component reliability or plant safety.

Digital image storage on our equipment produces calibrated thermal images that contain over 78,000 independent temperature measurements that can be measured at any time with IR software products on standard PC platforms.



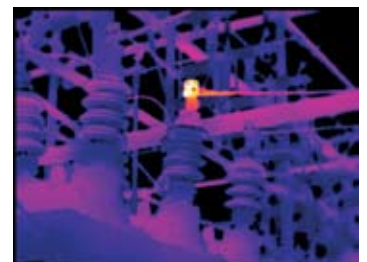
An electrical circuit breaker is clearly shown as overheating, indicating a problem such as a poor connection, an internal fault, or corrosion.



A transformer is shown with the oil level too low.



A sediment line is identified in a process plant ducting.



Ultrahigh voltage power lines showing poor connection.