

# Infrared Thermography

Allianz Risk Consulting

## Introduction

### What is Infrared Thermography?

Infrared radiation is thermal, or heat radiation. Infrared radiation is invisible to the eye and is produced by any object that is warmer than its surroundings. Thermography is the process of photographing this heat energy.



As an object gives off heat, the infrared radiation varies in intensity. By using a specially designed camera the intensity can be displayed visually utilizing various color templates to express the information. The application of infrared technology has been widely used by the military in heat seeking missiles and night vision equipment. Medical and industrial uses of infrared radiation include thermal imaging, or thermography.

### How does this technology have a commercial or industrial application?

Since all objects emit heat, an infrared camera can be used to detect and measure the temperature variations from one surface to another. Electrical systems (connections,

equipment, components) emit heat as current flows through them. Should a problem in a system exist, resistance increases and heat is liberated at a rate greater than the surrounding area. This variance can be detected and measured with the use of infrared thermography.

### Why consider having an infrared thermography survey of electrical systems?

An infrared survey can help detect a problem before it manifests itself through a costly failure. It is very common to find a loose wire or connection that can be repaired inexpensively. However, if it were allowed to fail, the cost could potentially skyrocket to thousands of dollars for equipment repair or replacement. The failure could also result in a major production outage or fire. The infrared scan is conducted while the equipment is in operation and preferably near full-load capacity, which gives a more accurate measure of the severity of the finding.

### What type of systems can be surveyed?

Examples of what can be scanned:

- Electrical switch gear, breakers, bus connections, and contacts
- Mechanical couplings on rotating equipment
- Process piping and heat exchangers
- Motor and generator connections, windings, feeders and excitors
- Bearings
- Friction in drive gears and drive belts
- Refractory systems (e.g., boilers, kilns, molten material containment)

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### What type of findings are reported?

The photos of the electrical system condition are only the starting point. Reports can be tailored to meet specific needs. Specific information can be included in the report that can bring light to the severity of the situation. Reports typically include an image of the condition, both in infrared and visual light, an analysis as to why the condition exists, and suggestions for correcting the problem. Reports may also include the following information:

- Estimated cost to repair before failure
- Estimated cost to repair after failure
- Estimated business interruption to total production
- Estimated number of days location could experience business interruption

### What do infrared photos of possible electrical component failures look like?

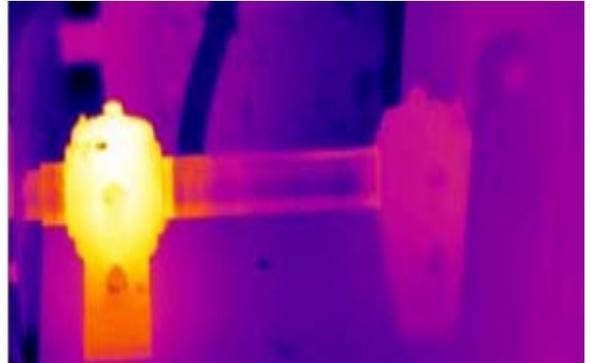


The above photo shows an electrical lead as would be seen by an electrician or maintenance technician.



The above photo shows the same lead in operation at 320° F.

*Photo Courtesy HSB Thermography Services. Used With Permission*



The above photos show a hot bearing operating at 220° F. While the cooler one is 130° F.

### How can I get more information about an Infrared Thermographic survey?

- Contact your Allianz Risk Consultant
- Call the Allianz Loss Control Help Desk toll-free at +1-888-527-6872