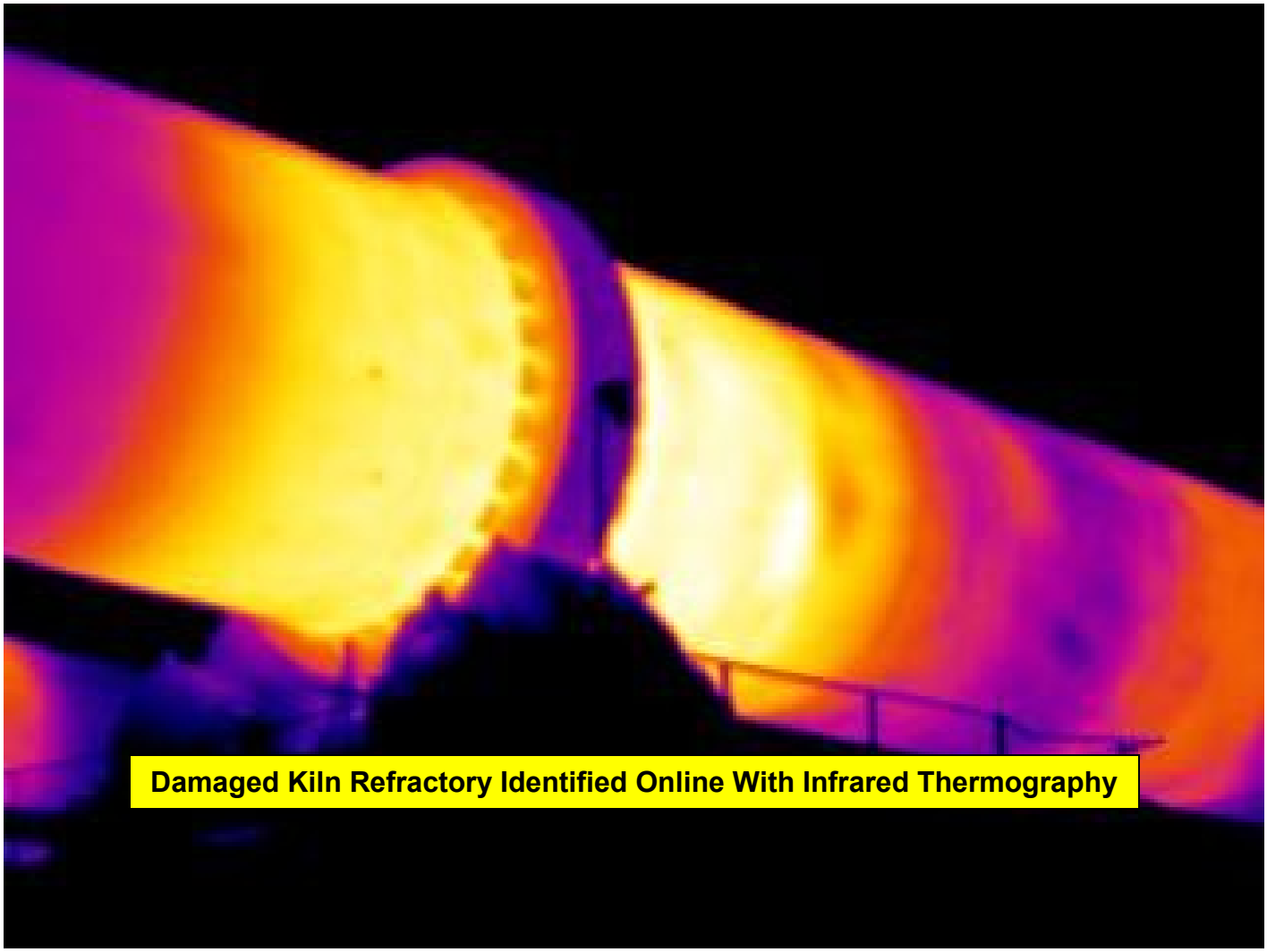
Infrared Thermography



Damaged Kiln Refractory Identified Online With Infrared Thermography

Infrared thermography is a non-contact method of detecting thermal anomalies.

Thermal anomalies, also called “hot spots”, usually ***precede equipment failure***.

Using state of the art infrared systems, Allrisk Engineering can evaluate and analyze these “hot spots”, ***before failure occurs***, preventing costly equipment failures.

Infrared thermography can be used to evaluate any object that generates heat such as electrical equipment, mechanical equipment, buildings, etc.

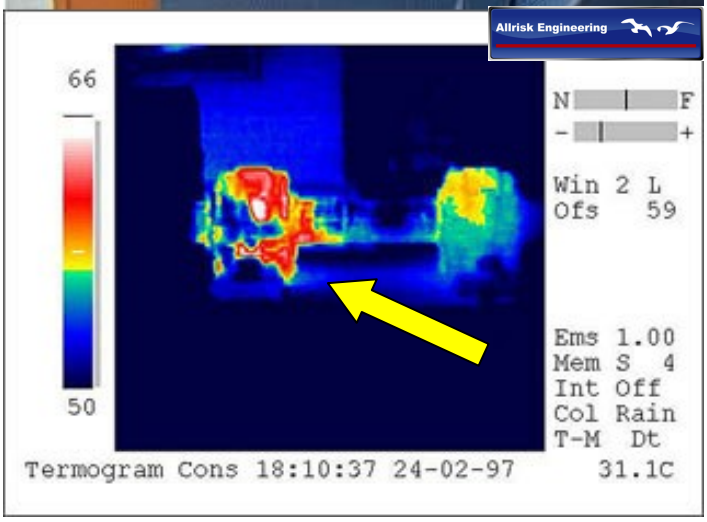
903 East Main Street
Suite 206
Auburn, WA, USA, 98002

Allrisk Engineering

Tel: 253-735-0554
www.allriskengineering.com

THE BENEFITS

- A proven nondestructive testing method.
- Provides high resolution non-contact thermal images.
- Can also provide non-contact temperature profile.
- Thermographs are fast and can provide real time imaging.
- Testing is done while equipment is in operation.
- Valuable for many diverse applications.
- Enhances value of other test methods.
- Images can be colorized to provide thermal mapping.
- If properly used, returns on investment, even of the basic applications, are tremendous.



THE LIMITATIONS

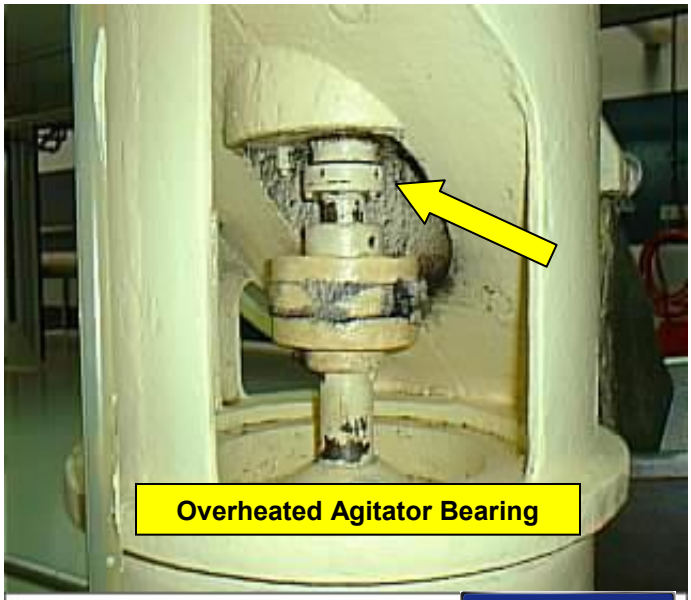
- What you see is not necessarily what is “real” , just a thermal image.
- Absolute non-contact temperature measurement, especially on thermally reflective surfaces, require experience to evaluate properly.
- Interpretations of thermal data can be complicated – background temperatures will affect readings.
- IR cameras cannot see through metal or wood or materials such as glass or clear plastic.
- IR cameras are proximity limited.
- Electrical equipment must be opened up prior to the survey.

SPECIFIC APPLICATIONS

ELECTRICAL INSPECTIONS

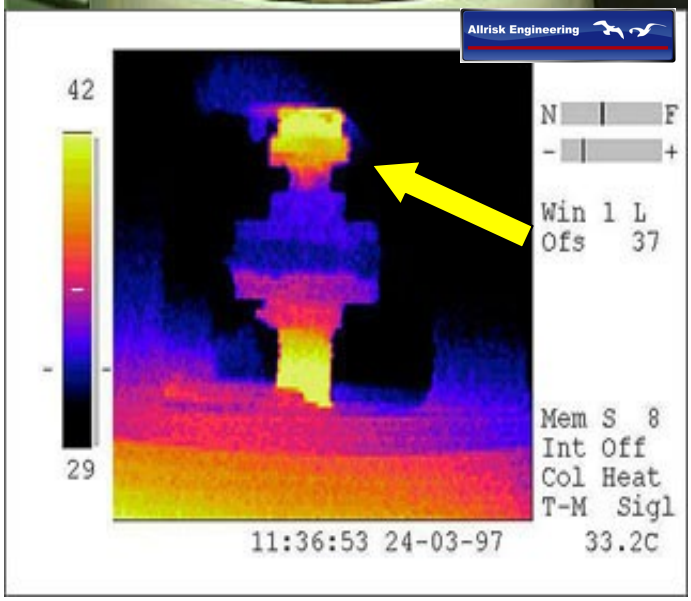
- Find “hot spots” related to loose connections.
- Locate imbalances and overloads.
- Check fuses, breakers, switch-gear and bus ducts.
- Inspect substations, transformers and overheat conductors.
- Check repair works after it is completed.
- Inspect new installations prior to acceptance from contractor.

REFRACTORY, STEAM AND FLUID FLOW



- Quickly check steam trap operation, even at a distance.
- Locate underground lines, pipes and leaks in lines.
- Check the integrity of pipe and tank insulation.
- Locate early states of refractory breakdown in furnaces and boilers.
- Check for air leakage and uneven heating in ovens and furnaces.
- Find fluid levels in tanks and blockage in piping.
- Inspect hydraulic systems for leaks, bypasses, plugged filters, etc.

MECHANICAL INSPECTIONS



- Inspect bearings and couplings on rotating equipment.
- Quickly locate blocked cooling ports in motors.
- Help diagnose coupling, belt and gear alignment problems.

ROOF MOISTURE SURVEYS

- Provide key information for a long-term maintenance program.
- Locate wet or damaged insulation.
- Check the integrity of new roof systems prior to acceptance.
- Verify repairs.
- Identify extent of damage caused by storms, contractors or other sources.
- Identify wet insulation for removal prior to installing recovery membrane.
- Inspect the roof before the warranty expires.

BUILDING DIAGNOSTICS

- Diagnose insulation and comfort problems.
- Determine location of existing insulation.
- Provide quality control inspections of new and retrofit insulating work.
- Find air leaks.
- Reduce freezing of water systems caused by air leakage.
- Verify fire sealing.
- Check HVAC systems for air circulation and distribution problems.
- Diagnose condensation problems.

PRODUCTION PROBLEM SOLVING

- Monitor processes with thermal signatures, including moisture and thickness.
- Create continuous temperature maps over large areas of a process.
- Understand the thermal influences of the micro-climate on the process.
- Improve placement of thermocouples and thermal controls.

WHEN IS THE BEST TIME TO SCHEDULE AN IR SURVEY?

- Prior to a schedule shutdown to determine exact maintenance needs.
- Upon acceptance of a new piece of equipment, machinery or buildings.
- Prior to the expiration of a warranty.
- After a repair or change has been made to a machine or process.
- For real time monitoring to assess the impact of changes.
- To verify data from other test methods.
- Whenever a visual indication of a thermal phenomena is needed.

PREPARING FOR AN IR SURVEY

- Electricians needed to open up cabinets and remove box covers.
- The IR technician must be able to physically see the equipment to survey it.
- Electrical equipment needs to be operating at 40% or more of rated load.
- A one line diagram of the site electrical system to guide the IR technician and electricians.
- Insulating materials on equipment to be evaluated must be removed prior to survey.