

# Thermal Imaging

*Inspection technology on the cutting edge*



## About Infrared Cameras

Infrared (IR) cameras are quickly becoming an indispensable tool for home inspectors. Reading the thermal images produced by an infrared camera during an inspection allows for quick and accurate identification of defects that may not always be immediately apparent to the naked eye.

## How Infrared Cameras Work

Infrared cameras translate the heat signatures of objects into colors on a gradient scale, with higher temperatures appearing as lighter colors, and lower temperatures and wet areas appearing as darker colors. Also known as thermal imaging and thermography, IR technology captures the light that exists just outside the visible spectrum. Thermal images show surface-heat variations, which is why an IR camera is such a diverse tool for commercial and home inspectors that can be used for a variety of applications.

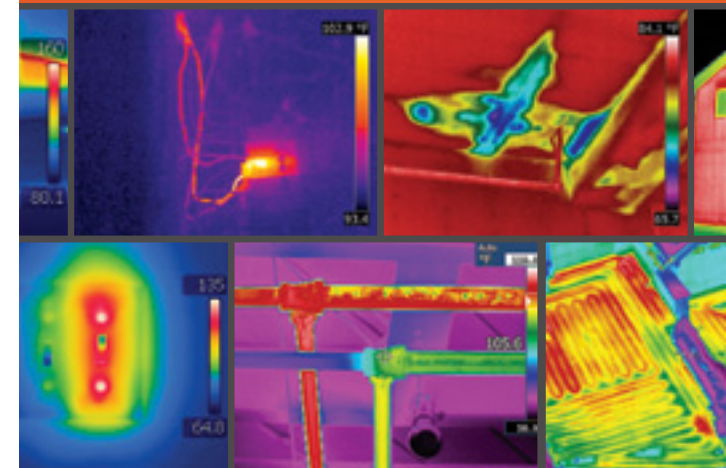
Abnormally hot electrical components and connections can be viewed during an electrical inspection. Areas of moisture that may lead to leaks and structural damage can be located based on apparent temperature differences. Heat loss and air leakage in a building envelope, and even areas of insufficient insulation, can be pinpointed quickly and accurately during an energy audit.

## Certified InterNACHI Inspector

- I am a member in good standing of the International Association of Certified Home Inspectors (InterNACHI).
- I am Infrared Certified®
- I adhere to the InterNACHI Standards of Practice.
- I abide by the InterNACHI Code of Ethics.
- I stay up to date with the latest inspection techniques in the industry through Continuing Education.

Regular inspections of your house are an important part of home maintenance. Including thermal imaging in your inspection is the most effective way for me to locate and document defects quickly and accurately. As a qualified inspector, I will give you peace of mind about the safety of your investment.

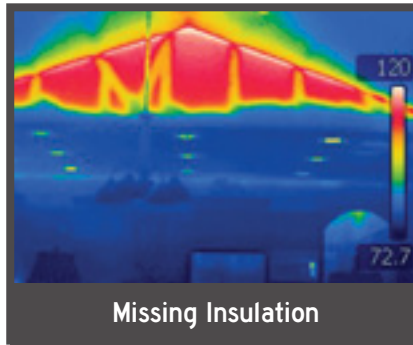
**Contact me today to schedule your inspection.**



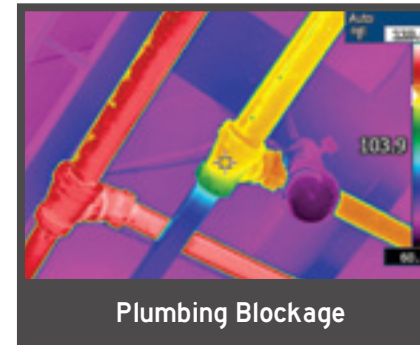
[www.NACHI.org](http://www.NACHI.org)

## An IR inspection can detect sources of energy loss, including:

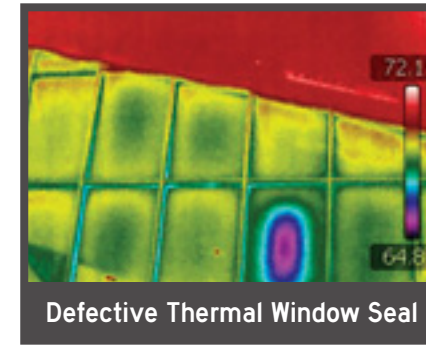
- heat loss and air infiltration in walls, ceilings, floors, windows and doors;
- damaged and/or malfunctioning radiant heating systems;
- air-conditioner compressor leaks;
- under-fastening and/or missing framing members, and other structural defects that can lead to energy loss; and
- broken seals in double-paned windows.



Missing Insulation



Plumbing Blockage



Defective Thermal Window Seal

## An IR inspection can locate moisture intrusion, including:

- plumbing leaks;
- hidden roof leaks before they cause serious damage;
- missing, damaged and/or wet insulation; and
- water and moisture intrusion around penetrations and at the foundation and building envelope that could lead to structural damage and mold.

## An IR inspection can find hot spots in the electrical system, including:

- circuit breakers in need of immediate replacement;
- overloaded and undersized circuits;
- overheated electrical equipment and components; and
- electrical faults before they cause a fire.

## An IR inspection can also reveal other problems, such as:

- possible pest infestation, as revealed by energy loss through shelter tubes left by boring wood-destroying insects;
- the presence of intruders, such as rats, mice and other larger pests hiding within the structure and detected because of their heat signature that the IR camera captures; and
- dangerous flue leaks, which can lead to carbon monoxide poisoning of the home's residents.

## Inspecting for Moisture Intrusion

Using an infrared camera provides certain advantages in locating moisture problems. Thermal patterns created by latent moisture become readily apparent when viewed through an IR camera, even when they are not visible to the naked eye. This is because the IR camera sees the apparent temperature difference between wet spots and building materials. Water intrusion and excessive moisture within walls, under floors, and above ceilings will show up in the thermal image.

## Electrical Inspections

During an inspection, electrical equipment, such as distribution panelboards, switch boards, contacts, transformers, receptacles, and service and control panels, can be examined through an IR camera. By viewing apparent temperature differences, inspectors can identify and document problems, such as loose connections and overloaded circuits, which are the most common causes of electrical fires. Other issues, such as transformer cooling problems, induced currents, arcing, and motor-winding faults, also become readily apparent.

Because viewing apparent temperature differences through an IR camera requires no physical contact and can cover a lot of space in one sweep, no other technology allows electrical faults to be found as safely and as quickly as thermal imaging. Another important benefit is that it allows problem areas and components to be located before damage from any serious failure or electrical fire occurs. This helps ensure safety. It can also save money that might otherwise need to be spent on extensive repairs.

## Inspecting for Air Leaks

Infrared imaging is especially useful during an energy audit because it allows the inspector to actually view the apparent temperatures in a given area, helping him to locate air leaks and insulation defects.

By purposely controlling the temperature and air pressure in the interior of a house, air can be forced inside through cracks and holes. Using an infrared camera, the sources of these air leaks can be quickly located and visually documented. Areas of insufficient insulation also become more apparent when viewed through an infrared camera and can be visually documented, as well.

## Inspecting Roofs

Replacing damaged roofs can cost as much as \$8 to \$10 per square foot. The main causes of premature roof failure and high maintenance costs are moisture intrusion and undetected wet insulation inside the roofing system. Because thermal imaging makes apparent temperature differences viewable, it is excellent at finding moisture and then documenting problem areas during roof inspections.

The roof absorbs heat during the day and releases it when the temperature falls later. Wet areas release heat slower than dry areas. Because of this, the wet and dry areas are readily viewable in a thermal image, which displays apparent temperature differences as gradient colors.