



Home Probe, Inc

1610 Hosea L. Williams Drive, Suite C · Atlanta · GA · 30317 · 404-218-1040

THERMAL IMAGING AND HOME INSPECTION

What is it?

Thermal imaging is a non-invasive process that uses an infrared camera to measure (and record) the surface temperature of materials. Color images show temperature differences on surfaces. Thermography is not X-ray vision, and does not look through walls or materials.

How is it used in homes?

Two purposes

1. Energy conservation – missing insulation and air leaks, for example.

Thermographic scans may be included with energy audits.

2. Building problems – water leaks, overheated systems, insect nests, etc.

Thermal imaging is often used to identify flat roof leaks on large commercial buildings for example, because the dollars are very significant.

Conditions matter

Infrared cameras read temperatures. Temperature differences in the building shell only exist if there is a difference between the indoor and outdoor temperature. A minimum 20°F difference between indoors and out is ideal. With smaller temperature differences, interpretation gets even more difficult.

Can anyone do it?

There is no licensing and anyone can buy and use an infrared camera. The cameras are expensive (\$5,000 to \$50,000), and quality training and experience are important to get good results. We are not aware of any broadly recognized protocol for thermal imaging of homes. Misinterpretation of the data is common and there are many people offering the service with little training and experience. Heat sources, solar loading and shading, foil and metal surfaces, and mirrors and windows can all cause bad conclusions. It's like the medical profession. Owning a stethoscope does not make one a doctor.

Should a home inspection include a thermographic scan?

It depends on the goals of the home buyer.

1. To help evaluate energy performance.
2. To look for problems that may not be otherwise found.

Energy evaluation

The energy performance of a home is not usually a major factor in home-buying decisions on homes. Adding insulation where practical and air sealing homes is relatively inexpensive. An energy audit that includes thermal imaging makes great sense after taking possession of a home.

Problem identification

Thermal imaging sometimes suggests problems that may not be identified during a home inspection. These include concealed water leaks, insect nests, mold, overheated electrical or

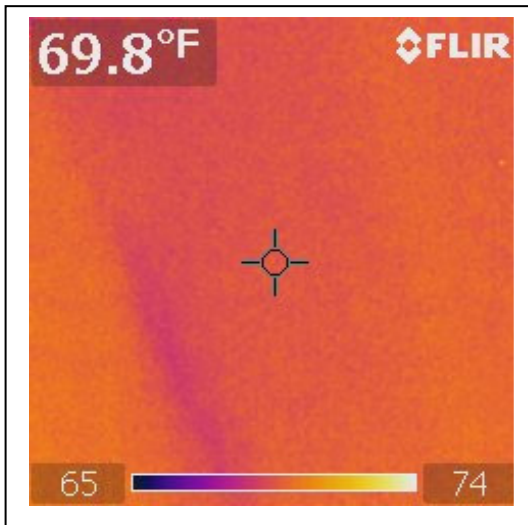


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mechanical equipment, leaky ductwork, and defective radiant heating systems. However, in our experience, thermal imaging rarely uncovers issues that would affect a buyer's decision. On the contrary, relying on infrared images to determine potential issues with the home can lead to a false sense of security. If there are no conditions at the time of inspection to create temperature differences that can be confirmed by the thermal imaging device then these issues can easily go undetected. A thorough visual evaluation to the American Society of Home Inspectors Standards of Practice is the best tool in the box for performing a home inspection.

Review the photos below. The image on the left was taken with an infrared camera. The image on the right was taken, from the same area with a standard digital camera. There is a visible area of heat loss on the left side of the ceiling (helpful in an energy audit) but the water leak that is noticed in the normal image is not detected. This is because there has not been rain at this building for several days and there is no water present to cool this area and create temperature difference. It's not likely that the small area of heat loss would sway a purchaser one way or another in their buying decision. However, it is likely that the decision of buying a home that may need a new roof, in short order, could impact how one may proceed with the transaction.



A comprehensive infrared scan with a detailed report performed by a qualified, experienced thermographer typically costs several hundred dollars, although some offer scans for less. You usually get what you pay for. It's all about return on investment, and most professionals believe that the value of thermography as a problem identification tool during the home inspection process is marginal.

Thermal imaging performed by inexperienced people can raise false issues and ignore others. As with many tools, a great deal depends on the operator.

Our Advice

We believe thermal imaging can be a valuable diagnostic tool as part of an energy audit. It can also be helpful in some cases for identifying building defects. If you are buying a home, the home inspection is a 'must have'. A thermographic scan may be useful, but can be deferred until you move into the home, in our opinion.