

## **THERMAL IMAGING AND HOME INSPECTION**

Scotts Inspections Inc.

### **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, insects nests, etc.

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

### **Conditions matter**

Infrared cameras read temperatures. Temperature differences in the building shall only exist if there is a difference between the indoor and outdoor temperature. A minimum of 20F 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. These cameras are expensive (\$2,000 to \$5,000), and quality training and experience are important to get good results. Standard methods for infrared scans on building envelopes are available from ASHRAE (American Society of Heating, Refrigeration, and Air-Conditioning Engineers) and ASTM (American Society for Testing and Materials). There are three levels of certification for thermographers (Level I, Level II, and Level III) available from the Infrared Training Center. These designations include both training and experience criteria. We suggest a minimum Level II Thermographer or a professional engineer.

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 lead to bad conclusions. It's like the medical profession- Owning a stethoscope does not make you a doctor.

### **Should a home inspection include a thermographic scan?**

It depends on the goals of the homebuyer.

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. It is relatively inexpensive to add attic insulation and air seal a home. An energy audit that includes thermal imaging makes some sense after taking possession of a home.

There are many who believe that the most serious of insulation defects are in the attic, and are reasonably easy to identify in most homes. If there are voids in the wall insulation, it is often not cost effective to correct these. A gap in insulation is much like the window in the wall, from an installation standpoint windows have no insulation, and typically have lower thermal performance than a wall with no insulation. Thermal imaging that reveals gaps in insulation may be dramatic, but corrective action is often not practical.

### ***Problem Identification***

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

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 investment, and most professional 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. A with many tools, a great deal depends on the operator.

### **Our advice:**

We believe thermal imaging may 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 can be deferred, at lest until you move into the home, in our opinion.