



## Infrared Scanning

### Thermography Inspection

Energy auditors may use thermography—or infrared scanning—to detect thermal defects and air leakage in building envelopes.

### How They Work

Thermography measures surface temperatures by using infrared still cameras. This tool sees light that is in the heat spectrum. Images on film record the temperature variations of the building's skin, ranging from bright colors for warm regions to dark for cooler areas. The resulting images help the auditor determine whether insulation is needed. They also serve as a quality control tool, to ensure that insulation has been installed correctly.

A thermographic inspection is either an interior or exterior survey. The energy auditor decides which method would give the best results under certain weather conditions. Interior scans are more common, because warm air escaping from a building does not always move through the walls in a straight line. Heat loss detected in one area of the outside wall might originate at some other location on the inside of the wall. Also, it is harder to detect temperature differences on the outside surface of the building during windy weather. Because of this difficulty, interior surveys are generally more accurate because they benefit from reduced air movement.

Thermographic scans are also commonly used with a blower door test running. The blower door helps enhance air leakage through defects in the building shell. Such air leaks appear as dark streaks in the infrared camera's viewfinder.

Thermography uses specially designed infrared still cameras to make images (called thermograms) that show surface heat variations. This technology has a number of applications. Thermograms of electrical systems can detect abnormally hot electrical connections or components. Thermograms of mechanical systems can detect the heat created by excessive friction. Energy auditors use thermography as a tool to help detect heat losses and air leakage in building envelopes.

Infrared scanning allows energy auditors to check the effectiveness of insulation in a building's construction. The resulting thermograms help auditors determine whether a building needs insulation and where in the building it should go. Because wet insulation conducts heat faster than dry insulation, thermographic scans of roofs can often detect roof leaks.

In addition to using thermography during an energy audit, you should have a scan done before purchasing a house; even new houses can have defects in their thermal envelopes. You may wish to include a clause in the contract requiring a thermographic scan of the house. A thermographic scan performed by a certified technician is usually accurate enough to use as documentation in court proceedings.

At High Country Conservation Center we use a FLIR thermal imaging camera, which produces a 2-dimensional thermal picture of an area showing heat loss. Other kinds of thermal measuring tools like spot radiometers and thermal line scanners do not provide the necessary detail for a complete home energy audit. Also, infrared film used in a conventional camera is not sensitive enough to detect heat loss.

### Pricing for Infrared Camera work:

\$120.00 per/hr includes copies of IR images

Prices for Summit County, travel outside the county subject to travel charges

### Consider IR Scanning for:

- Pinpoint air leakage assessment
- Building shell & insulation assessment
- Building Warranty Issues (ice dams, moisture issues, bulk water leakage, radiant heat issues & locating)
- Pre-home purchase assessment
- Builder & Contractor training