ALEXANDRIA
LIBRARY

Thermal Camera Instructional Guide

ALEXANDRIA LIBRARY

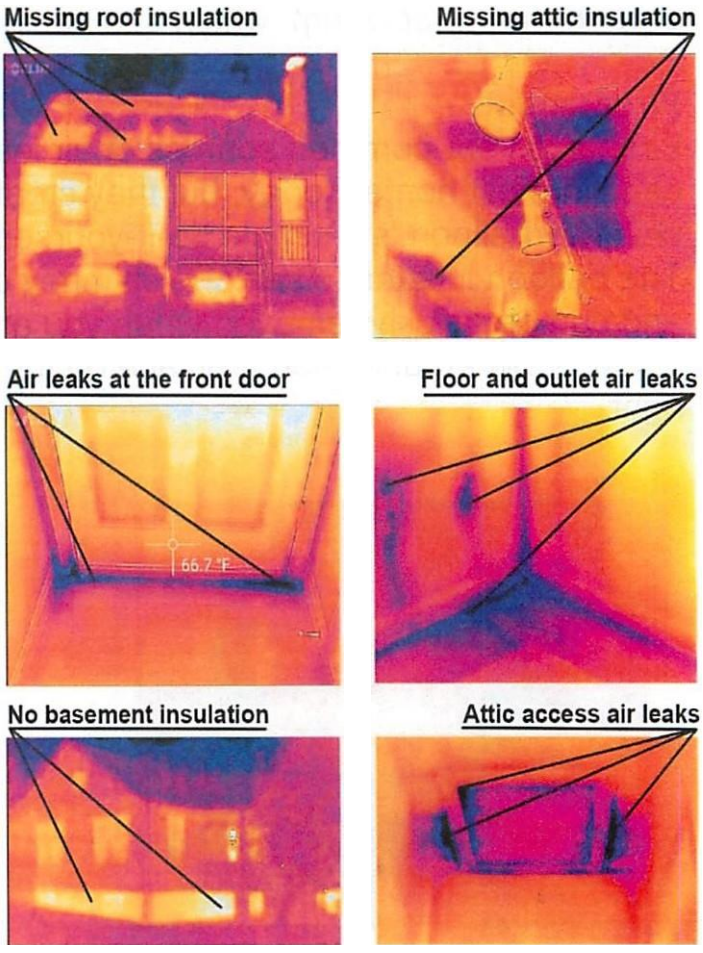
How to Use a Thermal Imaging Camera to Improve Your Home

A thermal imaging camera uses special sensors and a color map to illustrate the different temperatures of whatever you look at through the camera lens. This great tool shows you what your eyes can't – weaknesses like missing insulation or air leaks around windows that can make regulating your home environment difficult and cause higher utility bills.

The summer and winter are ideal times to use thermal imaging technology to inspect your home since it works best when the interior and exterior temperatures differ by 20 degrees or more. In the images, colder temperatures show up as blue and purple. Warmer temperatures appear yellow, orange, red, and white.

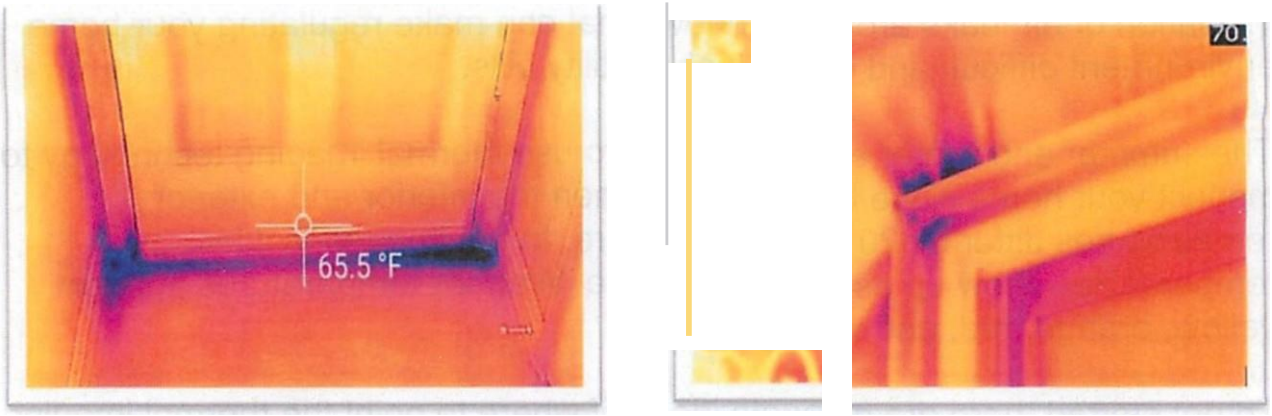
To get started, here are a couple ideas of where to point the thermal imaging camera in your home.

- Doors and windows
- Ceilings and walls
- Recessed ceiling lights and outlets
- Fireplace
- Exterior of your home and roof
- Attic access areas



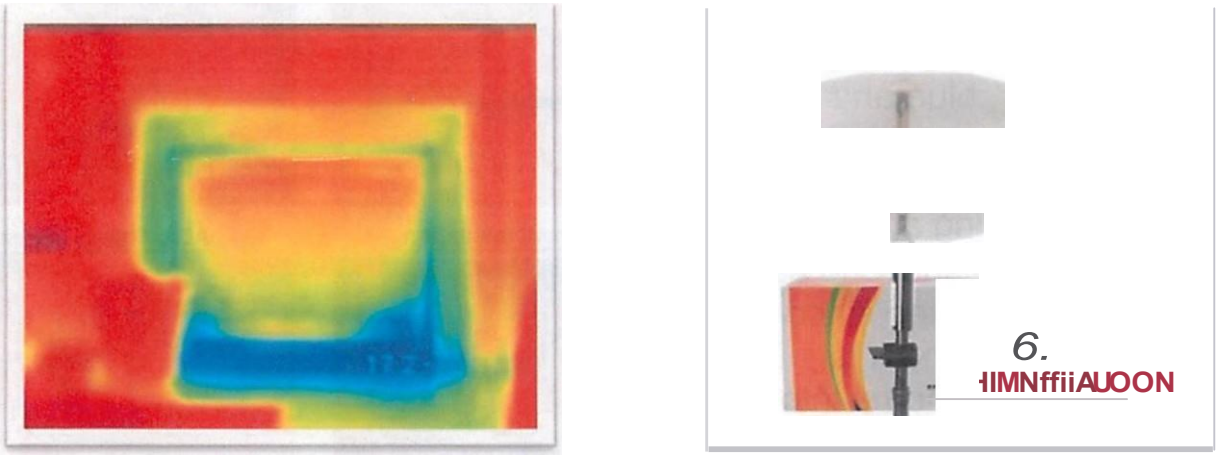
These images were taken in winter and show cold air seeping into a warm house. When looking around the inside of your home during the winter, blue and purple areas indicate where cold air is leaking into your warm home. When looking at the house from the outside, the same areas would show up as yellow, orange, and red since they indicate where heat is escaping from your home into the cold.

Doors and Windows:
In the summer, poorly insulated windows and doors will appear warmer, as air from outside enters your cool home. Areas missing insulation will likely appear as warmer as well, when viewed from the inside.

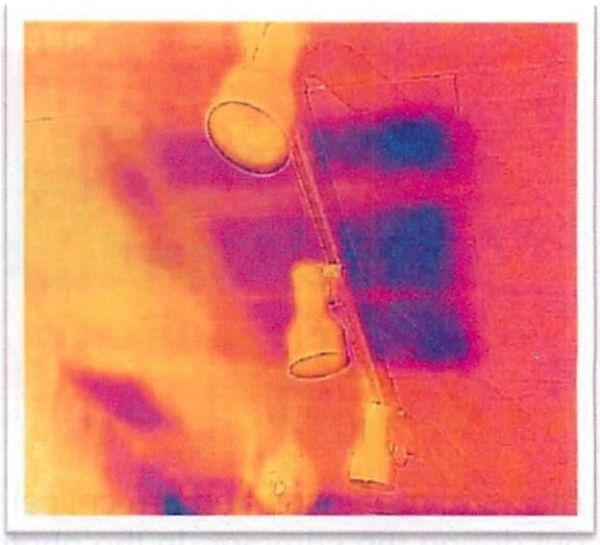


Leaks around doors and windows are common and can be easily addressed. The image on the left shows cold air leaks around a front door that can be fixed with weather stripping. The image on the right shows a cold air leak around the window trim, which can easily be sealed with caulk.

Fireplaces:
Fireplaces are common sources of air leaks. Fireplaces are not frequently used in most homes today, but they create drafts all year. An inflatable chimney balloon is a simple do-it-yourself fix for leaking fireplace dampers . The balloon inflates to seal the chimney opening completely when not in use and can be quickly removed when you are ready to light a fire. The images below show an unsealed fireplace on the left and a chimney balloon on the right.

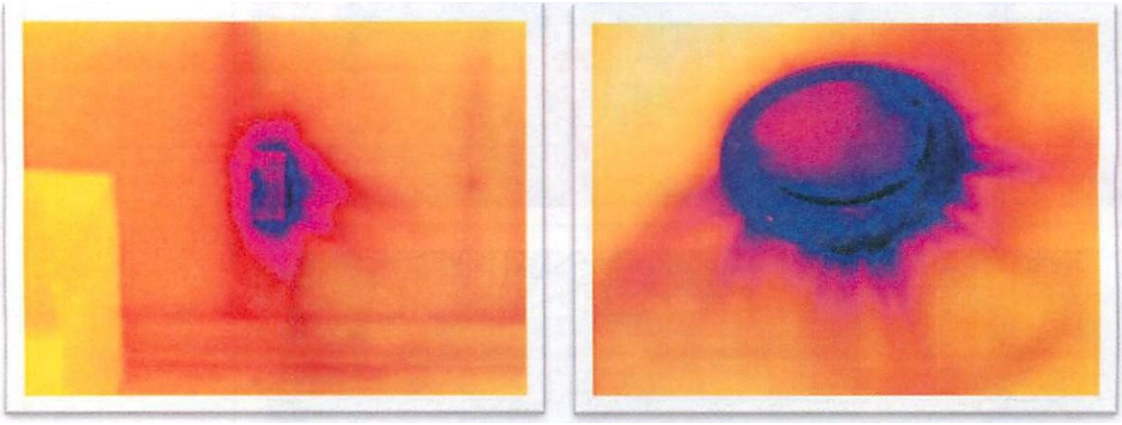


Ceilings and Walls:



Poorly insulated ceilings and walls can be tricky. Many older homes were built before insulation was widely used, so the top floor ceilings that have an attic above are often poorly insulated.
Similarly, the walls of upstairs rooms with adjacent crawl spaces (a.k.a. knee walls) are also often in need of greater insulation.

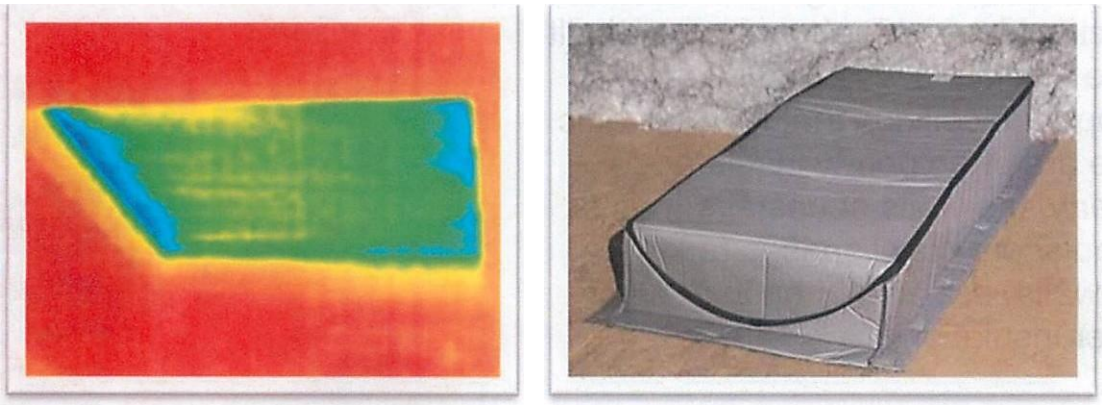
The image to the right shows an area of missing insulation above track lighting in a ceiling and air leaks getting in through an outlet (photo below, on the left) and air leaks around a recessed ceiling light. Recessed ceiling lights (a.k.a. can lights) and electrical outlets are often installed in rough openings that are not sealed. These issues can be mitigated by caulking the recessed lights and installing foam gasket covers around the outlets to eliminate drafts.



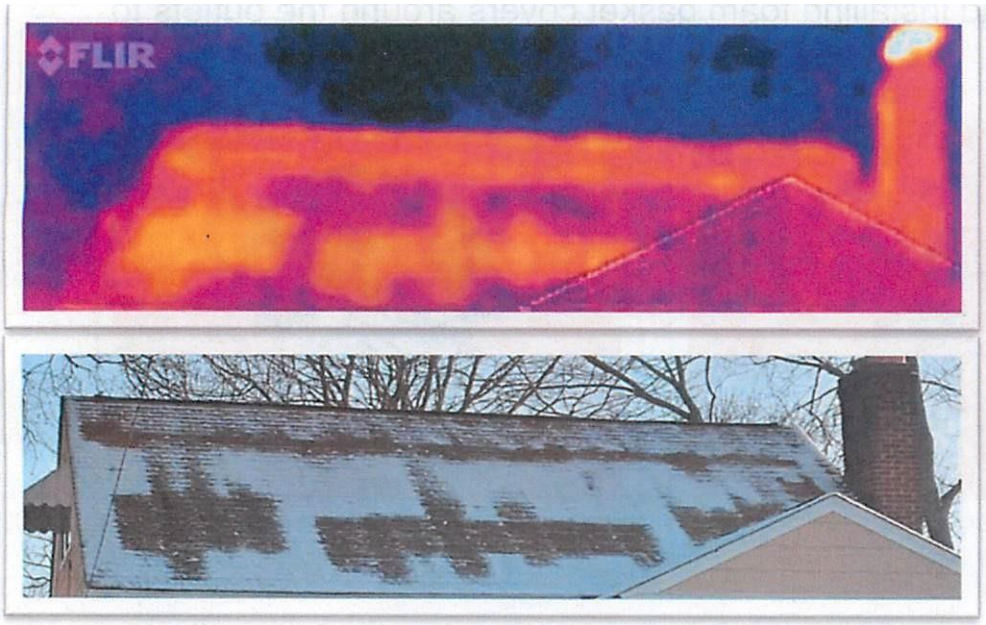
Attics:

Attics are often accessed through a pop-up panel or a pull down hatch with an extending ladder. Either way, a well-sealed attic access panel can help save energy and money. On the following page is an image of a leaking attic hatch taken from inside the home (photo on left). The image on the right shows an attic tent as viewed from the attic. The attic tent prevents air from getting in or out of the living space from the attic. The attic tent is easily stapled in place

and zips open and closed when attic access is needed.



Attic and roof insulation are critical for keeping heat in during the winter and out during the summer. In the photos below, the top image shows where insulation is missing under a roof. The bottom image was taken a month later following a snow fall. There is a clear correlation between the areas missing insulation and where the snow melted first (snow melted on the roof in areas where there is no insulation).



What happens if you find an issue?

If you are handy and can use a caulk gun or install insulation, give it a try! If not, you can contact a local contractor to help.

Getting an energy audit is the best way to comprehensively evaluate your home. An energy audit provides you with a prioritized list of actions to take in order to save energy and money. Energy auditors can also connect you with skilled weatherizers and insulation installers to help make your home more energy efficient and comfortable. BPI Certified contractors are trained to do energy audits.

BPI Certified Contractor Search: http://www.bpi.org/individual_locator.aspx

Questions or need more information?

Visit the Eco-City Alexandria website on Climate Change and Energy at alexandriava.gov/eco-city.