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What is Infrared Thermography, and how would my home benefit from a thermographic inspection?



An infrared thermographic inspection is a powerful, non-destructive, and non-invasive means of monitoring and diagnosing the overall condition of a building. It is used in applications, such as inspections, where conventional testing equipment and/or visual inspections are incapable of obtaining satisfactory results.

Infrared thermography technology provides immediate documentation of plumbing and building envelope water leakage, an assessment of damaged materials post-flood and fire, energy efficiency usage and electrical problems.

How the camera works

All objects radiate heat in the form of infrared energy; hot or cold. As an object increases in temperature, it radiates more energy. Infrared radiation, visible light, and ultraviolet light are all forms of energy in the electromagnetic spectrum; their differences are denoted by wavelengths and/or frequencies.

The infrared camera detects infrared energy well before it can be seen with our eyes. Most cameras can image temperatures from -20°C to 500°C and can extend even

further to -40°C and up to 2000°C. The camera converts the invisible infrared energy into a two-dimensional visual image and displays this on a standard TV monitor. Most industrial cameras can also make temperature measurements accurate to $\pm 2\%$ at 30°C. The thermal information is stored onto a disc and later downloaded into a computer to create a report.

What are common applications of infrared thermography?

Infrared thermography is a tool that can save energy in residential, commercial, and industrial situations.

An infrared inspection monitors and diagnoses the condition of a building by quickly identifying problem areas that can't be seen by the naked eye, and eliminates destructive probing methods, which could extend the building's life. In new construction, the infrared inspection can confirm proper construction.

All results are captured and documented instantly and easily into professional reports, providing tangible proof of the findings. This could potentially save both time and money.



The following applications demonstrate its unique ability to troubleshoot problems.

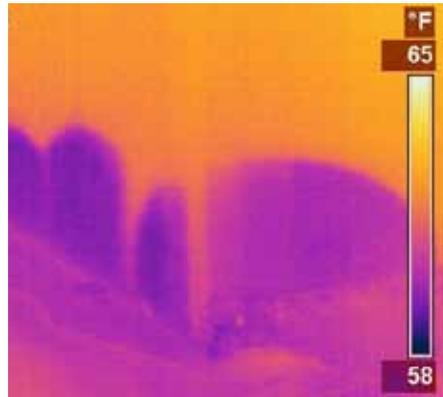
- **Leaks.** Leaks waste energy, whether they are caused by water, steam, or air. An infrared camera can locate leaks that would normally be undetectable (Picture 1-2). Heating and cooling costs can be reduced by pinpointing the source of the energy loss and ensuring that the building envelope is adequately air-sealed.



(Picture 1-2)

- **Moisture problems.** Moisture in building materials destroys structural integrity and nurtures mould. The first step in moisture problem remediation is to quickly and accurately locate and remove all sources of moisture. This means finding all concealed areas in walls, floors, and attics. Roof moisture can also be detected via infrared imaging. For example, there are thermal differences, which exist at certain times between dry roof insulation and insulation that has been infiltrated by water. On a sunny day, the roof

system conducts heat, which is absorbed by wet insulation and resisted by dry insulation. At night, the dry insulated areas will cool quickly, while the wet areas will retain their absorbed heat much longer.



- **Heating and cooling losses – insulation effectiveness.** Increasing fuel costs make it more important than ever to identify energy loss, resulting from insufficient or inadequately installed insulation in residential and commercial buildings. The resultant increased energy consumption from summer heat

gains and winter heat losses justifies an infrared energy loss survey. The infrared camera identifies poorly insulated or non-insulated pipes and detects areas of missing, moisture-laden or otherwise damaged insulation in walls, around doors, crawl spaces, attics, windows and electrical outlets. If cold air enters the home and heated air escapes during the winter, the operating costs are increased. The same is true for when the reverse happens during the warmer summer months.

- **Electrical problems.** Some electrical issues quickly identified with infrared thermography are loose/deteriorated connections, overloaded circuits, imbalanced loads, open circuits, and grounding problems. Most electrical issues have serious repercussions from both a safety and reliability perspective, if the problems go undetected.



To speak with a certified and trained AmeriSpec home inspector, contact us today.

1 (866) 284-6010 info@amerispec.ca

