Stop guessing - Start seeing

Infrared technology for building applications
A complete camera range for all users and budgets
Thermal Insulation

Maintaining acceptable temperatures in buildings (by heating and cooling) uses a large amount of energy. When well insulated, a building:
- is energy-efficient, thus saving the owner money.
- provides more uniform temperatures throughout the space and little or no heat loss or heat gain with the outside.
- has minimal recurring expense. Unlike heating and cooling equipment, insulation is permanent and does not require maintenance, upkeep, or adjustment.

Residential and Commercial Construction

Building insulation needs are similar in residential and commercial construction. The roof, floor, and walls, are the common places for insulating against heat loss or for heat containment. With correctly installed insulation, businesses with large facilities or multiple facilities can make significant savings on energy bills.

Locating the source of the inefficiency in energy use is the first step in cutting energy costs.

Energy audits of buildings are becoming increasingly popular as more companies look to establish their green credentials and save money at the same time. Infrared Thermography for building inspections shows what the eye cannot see.

Infrared Thermography, the perfect tool for building diagnostics

An infrared camera allows the user to scan an entire room in minutes, and quickly map the location of the problem areas. For example:
- Visualization of energy losses - makes heat losses, humidity and air leaks that occur in buildings instantly visible on colorful thermal images.
- Evaluate & Improve building insulation – Infrared thermography provides valuable information during renovation of buildings or in new and existing building audits. Inadequately insulated areas are located easily.
- Identify risk of Mold and Moisture problems – Locate areas prone to condensation and mold which can lead to problems for the occupant’s health.
- Location of leaks – typical examples include localized leaks from water pipes that are laid under the floor; or within flat roofs and walls.
- Electrical wiring – locate “hot spots” and repair as part of an ongoing restoration project or building addition.
- Termite Damage – Infrared cameras can even be used to identify areas of damage to buildings caused by rodents and pests. A great method to identify yet another hidden problem prior to purchase, lease or restoration of a building.
An infrared camera is an ideal tool for a building moisture survey as it detects moisture by imaging the different temperatures of wet versus dry building materials. This enables infrared to see and locate moisture problems before other standard moisture detection equipment.

Another useful advantage is that with infrared you can inspect places that physically cannot be entered. Infrared cameras instantly capture and record high-resolution infrared images of the water damage. Once the cause of a moisture issue is repaired, infrared can be used to monitor the drying process, showing when the moisture is completely gone. Infrared technology takes the guesswork away, by locating problem areas with speed and extreme accuracy, and finds issues hidden within walls and ceilings.

Control of energy efficiency and waste in buildings

An infrared camera will quickly and effectively detect areas of missing, moisture-laden or otherwise damaged insulation in walls, ceilings, floors, crawlspaces, attics or around doors, windows, electrical outlets and other access places where it would normally not be detected. This is particularly important for buildings with poor ratings in an energy declaration, where improvements can be focused on the most relevant areas. Contrary to other traditional methods an infrared camera produces images of the problem areas – thus revealing exactly where the problem areas are and which actions need to be taken. An ordinary air tightness test reveals how airtight the building envelope is – an infrared image shows where the problem is.

The new FLIR Reporter Building software works together with an infrared camera to visualize and quantify building related problems. With new unique features and new special building report templates it enables quantifying and estimation of cost of energy loss.

Missing insulation causes severe energy loss.

The infrared Picture-in-Picture image shows a point of missing insulation.

Locate and evaluate water damage and moisture intrusion

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A hidden pressure line leak can be easily spotted with a thermal camera, even from a distance.

Wet wall intrusion, impossible to see with the human eye, but clearly visible in infrared.

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<table>
<thead>
<tr>
<th>Detection and visualization of air infiltration and exfiltration</th>
<th>Leak detection in roof systems</th>
<th>Inspection of heating, ventilation and air-conditioning systems</th>
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<tr>
<td>Excessive air leakage can account for up to half of the energy consumed to condition buildings. Adequate air exchange is essential for the occupants’ health and safety, but most buildings have a far higher rate of air exchange than is necessary. The main reason is often poor design and/or construction which allows air leakage from the inside to the outside of the building.</td>
<td>The leakage pathway is often complex and, without thermal imaging, extremely difficult to visualize. With the help of infrared the contractors can quickly identify and repair problem areas for an immediate stop of energy loss.</td>
<td>Loose, poor-fitting or disconnected heating, ventilation and cooling (HVAC) system ducting can lead to moisture issues and poor building airflow, as well as wasted energy and money! Early detection and correction of these issues via infrared images should be a high priority and will save money and discomfort to both the owner and occupants.</td>
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<td>Air infiltration</td>
<td>Air exfiltration</td>
<td>Moisture intrusion</td>
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<tr>
<td><img src="image1" alt="Air infiltration of cold air shown using the Picture-in-Picture function." /></td>
<td><img src="image2" alt="Air exfiltration of warm air leaking from the inside." /></td>
<td><img src="image3" alt="Image of the roof of a refrigerated building, showing moisture intrusion into a hole of the roof." /></td>
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<tr>
<td><img src="image4" alt="8 28" /></td>
<td><img src="image5" alt="6 10" /></td>
<td><img src="image6" alt="8 36" /></td>
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Loose, poor-fitting or disconnected heating, ventilation and cooling (HVAC) system ducting can lead to moisture issues and poor building airflow, as well as wasted energy and money! Early detection and correction of these issues via infrared images should be a high priority and will save money and discomfort to both the owner and occupants.
Infrared is being used with great success to see the underlying building construction. One common application is to verify bond beams and placement of reinforcing in concrete masonry unit walls, as well as structural elements of pre-cast, tip-up walls. Because the inspection is conducted during construction, deficiencies can be corrected prior to occupation with relatively minor inconvenience. Due to high energy costs as well as health concerns regarding mold growth in cold wall cavities, verification of placement of insulation in masonry unit walls is now much more important than in the past.

Inspection of electrical systems

Issues with electrical connections, wiring or other system components are clearly highlighted as "hot spots" with infrared images - making them easy to locate and repair as part of an ongoing restoration project or building addition.

Infrared cameras are very effective at quickly and accurately detecting overloaded circuits, faulty wiring and loose electrical connections.

Inspection of plumbing systems

Blockages in pipes can be quickly located and addressed via infrared – enabling immediate response when required. The use of this nondestructive technology provides for pro-active action to be taken - before the problem gets worse. Water leaks from pipes, whether in a floor, wall, ceiling or under a concrete slab, can also be located using an infrared camera.

Inspection and visualization of building constructions

Infrared instantly reveals the underlying construction and sometimes construction faults.

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FLIR infrared cameras for building applications

A complete range of infrared cameras and software especially designed for the building industry

**FLIR i5**

The smallest and lightest infrared camera on the market

- 80 x 80 pixels infrared resolution
- Small and lightweight (340 g)
- Fully automatic
- 5 hours battery life

Fault findings, trouble shooting for multipurpose use

- Entry level infrared camera that fits even a small budget
- Fully automatic, very small and lightweight camera - only 340g
- Perfect for all-round troubleshooting with less requirement for analyses

**FLIR B60 SERIES**

Lightweight design, heavyweight performer

Available in 3 versions: FLIR b40, b50, b60

- Up to 180 x 180 pixels IR resolution
- Small & lightweight (600g)
- 2.3 megapixel digital camera
- Picture-in-Picture Functionality (fixed, 3step, scalable)
- Laser Pointer & Laser Locator
- Double LED lights
- Thumbnail gallery
- Dewpoint and insulation alarm

Perform electrical & building inspections - document your findings

- Compact camera with excellent image resolution (120x120 to 180 x180 pixels) and feature set
- For users with more demands on features and for whom documentation is important
- Extra features such as built-in LED lights for use in dark areas, Picture-in-Picture Image Fusion, visual camera and field replaceable 5h batteries.
- Lightweight (600g) and robust camera – fits use in rugged environments
- Equipped with insulation alarm & humidity (dew point) alarms

**FLIR B200-400**

Smart, compact and powerful

Available in 4 versions: FLIR B200, B250, B360, B400

- Up to 320x240 pixels detector resolution
- Compact and Lightweight design (880g)
- Integrated digital camera
- Touch screen plus stylus
- Tiltable lens unit
- Thermal Fusion & Picture-in-Picture functions
- Voice and text comments / Sketch annotations
- Relative humidity and Insulation alarms

For more demanding tasks where higher resolution and many features are needed

- An upgradable family of smart, compact and powerful cameras for more demanding building inspections
- For users with high demand on camera features, image quality, analysis and professional reports
- Image resolution from 200x150 to 320x240
- Innovative design and feature set; tiltable lens unit, touch screen, visualization tools, digital camera and Thermal Fusion / Picture-in-Picture image fusion
- Interchangeable optics (add on) for wider field of view
- Video out, Autofocus, Simultaneous IR/Visible storage
- Equipped with insulation alarm & Relative humidity alarms

Register your FLIR i5 and B60 Series camera at http://flir.customhelp.com/app/fl_register to extend the standard 1 year to warranty to 2 years - FREE

**www.flir.com**
FLIR B620, B660
Infrared Perfection
Available in 2 versions: FLIR B620, B660

WINNER

- 640x480 picture resolution
- 3.2 Megapixels auto-focus digital camera
- Thermal Fusion & Picture-in-Picture functions
- High Detector Sensitivity
- Tiltable view finder for outdoor use
- Built-in GPS
- Contrast Optimizer for enhanced image details
- Remote control (optional)
- Voice and text comments
- Relative humidity and Insulation alarms

640 x 480 pixels

State of the art camera family with outstanding power and performance.
For professional users who demand the highest performance and that need to rely on the camera for all kinds of building inspections.
The best image resolution and image quality on the market – 640x480 pixels, high sensitivity detector and contrast optimizer.
- Produces the most accurate and reliable temperature measurement
- Detects even small details at a distance, covers big areas in only one picture
- Built in GPS functionality, digital camera, Thermal Fusion and Picture-in-Picture functions, tiltable viewfinder and remote control.
- Interchangeable optics for wider field of view, flexibility and possibility to individually adapt camera settings
- Video out, Autofocus, Simultaneous IR/Visible storage, Tripod mounting
- Equipped with insulation alarm & Relative humidity alarms

For building inspections and tasks where the highest performance and reliability is needed.

FLIR Reporter
Building Software

A dedicated and flexible software for advanced analysis of building related applications

- Extended energy audit/declaration analyses
- Extended air tightness analyses and report
- Insulation deficiency analyses and report
- Cost estimation of energy loss
- Moisture problem report
- Building envelope report

The FLIR Reporter Building software works as a plug-in to the existing general FLIR Reporter 8.3 software and can be purchased separately or together as a package.

Easy report creation

- Take infrared and/or visual image
- Organize and analyse with software
- Create inspection report

www.flir.com