

## **Why are infrared cameras indispensable for building inspections ?**

### **What is infrared thermography?**

Thermography, also called thermal imaging, is the production of non-contact infrared or “heat” pictures from which temperature measurements can be made. Handheld or fix-mounted infrared cameras scan equipment or structures, then instantly convert the thermal images to pictures for monitoring or quantitative temperature analysis. By detecting anomalies often invisible to the naked eye, thermography allows corrective action before costly system failures occur.

Infrared thermography has evolved into one of the most valuable diagnostic tools for Predictive Maintenance and many other applications. It maximizes operations and safety in many industrial environments, but it also increases building efficiency. It is *the most economical way to discover construction failures and to communicate them.*

### **Rising energy costs**

Heating, ventilation, air conditioning costs have doubled over the last years and they will not drop spectacularly in the near future. Legislation pushes the implementation of energy-saving construction technology, materials and appliances for both residential and commercial buildings. Some European Union countries are busy clearing the details of the introduction of an “energy passport” (Germany) or “Home Condition Report” (UK). Relevant E-U directives are amended into national law packages and will be binding very soon. A passive house directive is likely to pass in 2012.

### **What has this to do with infrared thermography?**

The major advantage of infrared cameras is that they image and measure entire surfaces and provide clear images that can be stored, sent and analyzed. There are infrared cameras on the market with special measurement features for building diagnostics which enable an easy detection of building anomalies that often result into energy losses. Such cameras eliminate costly inspection techniques that require labor, time and destructive probing. Finding and repairing faulted areas thanks to infrared thermography saves energy resources, time, money and last but not least, provides a rapid return of investment on the infrared camera.

### **Who is interested in a building substance assessment?**

#### Building Owners

The building is an asset that is to be preserved or improved. Against this background, it is imperative to be able to assess and value the building substance thoroughly and quickly. Infrared building diagnostics caters to the private house

owner as well as to investment companies owning huge real estate units and employing or outsourcing a huge facility management staff.

Clear infrared images of normally invisible diagnostic evidence carry invaluable information prior to far-reaching decision-making, ranging from the costly roofing or façade repair of a row house to major investment project decisions.

#### Insurance companies

Building inspection data gathered by an infrared camera provide convincing evidence in property damage settlements. In addition, regular inspection of the building and its facilities allows the insured party to obtain a substantial discount on the insurance contract.

#### Building contractors, experts and specialists

Planning, control, supervision and documentation of the works becomes an important issue as the building sector is faced with new materials, a growing set of building regulations, ever-shorter time frames to get the job done and, in some regions, lack of a skilled workforce. The infrared camera enables to clearly document repair, restoration, insulation or HVAC works. Thermal images show customers and clients the exact problem and prove them that the problem has been repaired correctly. This evidence adds value to the contractor's skill and expertise. Moreover, to serve the above-mentioned groups, the infrared camera expands the range of services offered by building sector specialists.

Using a building applications infrared camera before every building valuation, transaction, or major HAVC repair maximizes value and minimizes costs.

#### **What can be done with an infrared camera?**

The camera can be applied inside as well as outside. Fields of application include any symptoms and signs marked by a temperature difference on a surface.

Here's a list of concrete capacities according to field of application

#### **Leak, humidity detection**

- Floor heating thermography
- Heating thermography inspections
- Building envelope thermography
- Air tightness testing
- Door seal inspection
- Wall seal heat loss inspection
  
- Moisture thermography inspections
- Roof moisture thermography
- Dew point thermography inspection

### **Building valuing/ damage, repair inspections**

- Due diligence thermography
- Covered openings search in walls
- Work documentation, quality control (before and after repair)
- Energy investigations
- Education

### **Classic maintenance AND building application**

- HVAC system performance and repair
- Home electrical inspection
- Indoor environment inspection
- Pest control
- Distant heating system inspection
- Checking drying efficiency of walls, floors, ceilings

### **Benefits : infrared cameras pave the way to :**

- reducing heating costs
- preserving and increasing the building substance
- supporting contractors in warranty claims
- checking repair quality
- detecting long-time construction damages
- detecting and preventing mold and decay
- preventing formation of condensation
- preventing humidity intrusion in building

### **About FLIR Systems and its building diagnostics product range**

FLIR Systems is the world leader in the design and manufacturing of infrared thermography cameras. The company has infrared cameras in use worldwide for applications including predictive maintenance, research & development, non-destructive testing, process monitoring and automation, building diagnostics and many others. FLIR Systems has four manufacturing plants located in the USA (Portland, Boston and Santa Barbara) and Stockholm, Sweden and operates direct sales offices in Belgium, France, Germany, Italy, the United Kingdom, the US, China, Japan and Australia. The company has over 1,300 infrared specialists, and serves international markets through a network of 60 regional offices providing sales and support functions.

FLIR Systems' response to the evolutions on the building market segment is a comprehensive range of cameras specifically designed and equipped for a fast and easy building inspection: the FLIR B200, B250, B360 and B400 and the new B660, featuring a unsurpassed 640 x 480 pixel resolution. The technological improvement of infrared detectors, caused by the exponential performance increase of semiconductors (chip technology) during the last decade results in a sharper image

quality while bringing the infrared camera within the budgetary limits of most building experts and contractors.

FLIR Systems strongly believes that this new building sector segment will create new opportunities and jobs

### **Expertise and evidence**

FLIR Systems has the following pool of best practice stories available (for the time being, only in English) to journalists who are interested in gathering content about building thermography applications

- IR applications in the field of forensic and construction defect engineering
- Moisture intrusion inspections of sports stadiums through the use of thermal imagery
- Infrared applications for post-construction radiant (floor) heating systems
- Infrared thermal imaging in indoor environmental investigations
- IR for detection of exterior wall moisture and delamination: a case study
- Roof gardens and infrared thermography
- Using IR Thermography to determine the effectiveness of radiant barrier insulation (Schutzfolie)
- Non-invasive roof leak detection using IR thermography
- Three ways the pest professional can use IR thermography
- Thermography consulting – the nuts and bolts of getting started
- Using IR for residential surveys
- Using IR for leak detection of hot underground pipes
- Analysis of HVAC system and building performance utilizing IR thermography, physical measurements and CFD modeling
- Thermal patterns due to moisture accumulation within exterior walls
- Infrared imaging and log construction thermal performance
- Using thermography for optimization, quality control and minimization of damages of floor heating systems

- IR Thermography in commercial environmental energy and maintenance surveys
- Tips, tools and trends in the infrared industry
- Infrared inspections on electrical installations in hospitals
- IR Inspection of passive houses during construction

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