



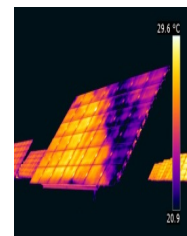
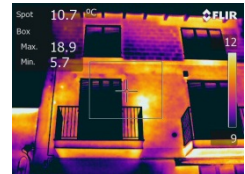
explore the thermal dimension

ITC Level 1 Thermography detailed course program

Level 1.

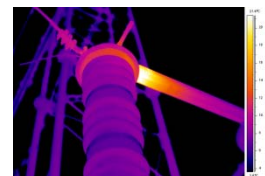
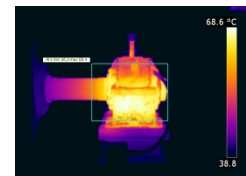
- **Day 1 – Lesson objectives**

- Start off the course
- Introduce ourselves to each other
- Take care of some practical business
- Know how to define infrared thermography
- Understand the subtopics that make up infrared thermography
- Understand the importance of temperature as a control parameter
- Understand what makes thermography unique and useful
- Be able to recall some examples of applications for infrared thermography
- Camera operations
- Insert the battery and memory unit
- Switch the camera on and off
- Focus automatically and manually
- Know and operate the menu system
- Auto adjust the image
- Manually adjust the image (level/span)
- Use measurement functions
- Preview (freeze) and save an IR image
- Thermal science
- Know the difference between heat and temperature
- Understand the difference between absolute and relative temperature scales
- Know how to convert temperatures between different scales
- Understand the concept of conservation of energy
- Understand the concept of direction of heat flow



- **Day 2 – Lesson objectives**

- Basic heat transfer
- Understand heat transfer
- Conduction
- Understand what four factors affect conduction, and how they do that
- Convection
- Natural versus forced convection
- The electromagnetic spectrum
- Radiation, understand the concepts of
- Emission
- Absorption
- Know how different types of radiation are classified
- Different wavelengths
- Know how visible light relates to infrared
- Understand what Mid wave and Long wave means
- Know the approximate wavelengths of the two
- Understand the reason why we have MW and LW





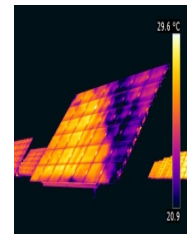
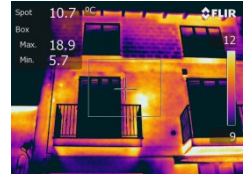
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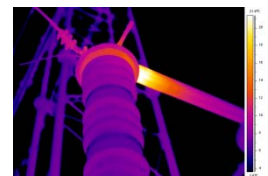
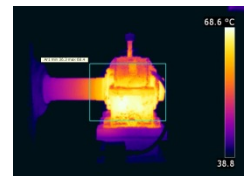
- **Day 2 – Lesson objectives (cont ...)**

- Understand incident and exitant radiation
- Know the components of each
- Understand the relationships
- Understand how the properties of an object will affect incident and exitant radiation
- Know what a blackbody is
- What its properties are
- Thermal image interpretation
- Understand what the infrared image represents
- Know the meaning of the term "apparent temperature"
- Understand how high and low emissivity can change the way the image appears
- Thermal image analysis technique
- Understand what a thermal gradient is
- Be able to use thermal tuning for pattern enhancement
- Be able to use the isotherm for pattern enhancement
- Be able to use palettes for pattern enhancement
- Be able to identify spot reflections and emissivity differences causing false or misleading thermal patterns



- **Day 3 – Lesson objective**

- Be able to explain the difference between Qualitative (comparative) and Quantitative (measuring) methods, and define them
- Know under which conditions you would use Qualitative and Quantitative methods
- Be able to apply given classification criteria to a Quantitative result
- Understand the purpose of baseline data
- Calibration of the camera
- Compensation for effects of the surroundings
- Compensation for emissivity, and temperature conversion
- Selecting camera measurement tools
- Emissivity – influencing factors
- Error potential in measurement
- Delta T and avoiding the "wishful thinking syndrome"
- Estimating emissivity and reflected apparent temperature
- Spatial resolution and target size



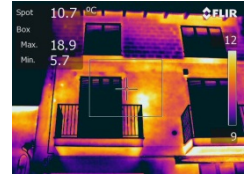


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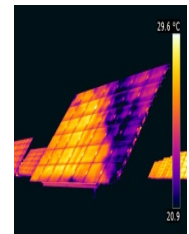
- **Day 4 – Lesson objectives**
 - Practical work with the IR Camera
 - Workgroup with some assigned exercises to understand the classical on field operator problems
 - Software lab
 - Prepare the reports of the assigned exercises



- **Day 5 – Lesson objectives**
 - Lab exercises, student presentations
 - Course refresh before the test
 - Exam – closed book, 50 questions with multiple choice answers test



- **Notes:**
- Each day
 - coffee breaks (mid-morning, mid-afternoon)
 - Lunch break



- The students are invited to bring their camera and laptop with the proper software installed. To download the latest software version please go to: <http://support.flir.com>

