



# Level II Infrared Certification

## Level II Course Summary

AIRT's Infrared Certification courses are designed to meet and exceed SNT-TC-1A recommended practices. This hands-on course will assist you in furthering your operating skills, developing new inspection procedures and applications, advancing your infrared P/PM program or consulting services, utilizing IR trending or software programs, performing advanced NDT applications and

attaining superior measurement skills for improved accuracy and diagnosis. Advanced theory, applications, equipment operations, thermal analysis and inspection techniques, marketing, plus much more, is presented in a simple, easy-to-learn, hands-on fashion. Course certificate, exam, one-on-one sessions, post course support and manual upgrades are also included.

## Level II Infrared Certification Outline

### Intermediate Thermal Infrared Physics

#### Basic Calculations for Three Modes of Heat Transfer

Conduction Principles and Elementary Calculations

- Thermal resistance
- Heat capacitance

Convection Principles and Elementary Calculations

Radiation Principles and Elementary Calculations

#### The Infrared Spectrum

Planck's Law / Curves

Spectral Emittance of Real Surfaces

Semi-Transparent Windows and Filters

#### Radiosity Challenges

Blackbodies – Theory / Concepts  
Emittance Problems

- Specular and Diffuse Emitters
- Lambertian Emitters Angular Sensitivity
- Effects of Emittance Errors
- Reflective Problems
- Quantifying Effects of Unavoidable Reflections
- Theoretical Corrections
- Transmittance Problems
- Quantifying Partial Transmittance
- Theoretical Corrections

### Intermediate Thermal Infrared Physics (cont'd)

#### Resolution Test and Calculations

IFOV and FOV Measurements and Calculations

MRTD

Slit Response Function-Measurement, Calculations, Interpretations and Comparisons

Resolutions vs. Lens and Distance

Image Data Density

### Level II Thermal Infrared Operations

#### IR Measurement & Quantification

Advanced Measurements

Quantifying Target Surface Emittance

Quantifying Temperature Profiles

#### Image Processing High Speed Data Collection

Producing and Recording Accurate Images

#### Special Equipment for "Active" Techniques

Hot or Cold Fluid Energy Sources

Heat Lamp / Flash Lamp /

Laser Energy Sources

#### Reports and Documentation

### Level II Infrared Applications

#### Active Applications

- Insulation Flaws
- Delaminations in Composites
- Bond Quality of Coatings
- Location of High Heat Capacity Components
- Electronics

#### Filtered Applications

- Sunlight
- Furnace Interiors
- Semi-Transparent Targets

#### Transient Applications

- Imaging a Rapidly Moving Process
- Imaging from a Vehicle

#### Software

- IR Software
- Asset Management

Advanced Temperature Measurement Methods

- Isotherm / Spot Measurement / Profiles
- Accurate field quantification

#### Advanced Applications

Electrical Thermography

Accounting for Load & Wind Effects

Mechanical Systems

- Performing Meaningful Inspections
- Baseline and Trending

### NETA CTD Program

#### Recognized Course

CTDCs: 38 hours

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The Academy of Infrared Training also offers economical **On-Site or In-House Training.**

We can tailor this training to your company's specific interests. In addition, you save on travel costs, and your technicians remain on-site and available for emergencies.

