



# 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

Academy of Infrared Training, Inc.  
702 Kentucky Street, Suite 720  
Bellingham, WA 98225  
Phone: 360-676-1915  
Fax: 604-516-6674

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

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1-888-673-4743

AIRT@infraredtraining.NET • www.infraredtraining.NET

