

Eddy Current Testing

Level I - 40 hours

Training Course Outline

SCOPE

This course prepares a candidate to Perform Surface Eddy Current Inspection and

- Perform Specific Calibrations
- Specific NDT
- Specific Evaluations for Accept or Reject Determinations according to written Instructions
- Record Results

TRAINING

Training material is presented in modules that are followed by quizzes



Eddy Current Equipment (a) Surface inspection Hocking, Nortec 1000, GE Phasec 3D
(b) Nortec and TC 5700 for Tubing

PERSONNEL CERTIFICATION

ASNT SNT-TC-1A

NAS 410

Training, experience and examination requirements

Training Requirements

- Recommended Course Outline
- Training Hours
- Practicals
- Quizzes and examinations

DISCONTINUITIES

- Types of Discontinuities: Inherent, Processing and Service
- Inherent: related to solidification of metal
- Primary Processing Discontinuities: Rolling, Forging, Drawing, Extruding
- Secondary Processing Discontinuities: Grinding, Heat Treating, Machining, Welding, Plating

- Service Discontinuities: Erosion, Wear, Fatigue, Corrosion, Creep

Module 1: Electricity

- Voltage, Current and Resistance
- Ohm's Law
- Inductance
- Impedance

Module 2: Magnetism

- Magnetism
- B-H Curve
- Permeability

Module 3: Electromagnetism

- Faraday's Law
- Lenz's Law
- Mutual Inductance

Module 4: Introduction to Eddy Current Generation

- Generation of Eddy Currents
- Impedance changes by Eddy Currents

Module 5: Generation of Eddy Currents

- Standard Depth of Penetration
- Effect of frequency, conductivity and Permeability

Module 6 – Impedance Plane – Surface Inspection

- Conductivity Curve
- Lift Off Curve
- Permeability

Module 7: ECT Instrumentation

- Impedance Displays
- Strip Charts
- Absolute and Differential Modes
- Portable Surface Inspection Equipment

Module 8: Eddy Current Probes

- Surface Probes
- Encircling Probes
- Tubing Probes

Module 9A: Surface Inspection and Applications

- Probe Selection
- Frequency Selection
- Setting the Display

- Edge Effect
- Applications

Module 9B: Inspection of Carbon Steel Welds

- Weld Probes
- Scan Plans
- Equipment Settings

Module 10: Test Parameters

- Frequency
- Filtering
- Suppression of Permeability variations

SPECIFIC TRAINING

- Surface ECT Procedure
- ASTM E-426

PRACTICAL TRAINING

- Setting up the Instrument
- Selection of Frequency
- Calibrations
- Exercises
 - Conductivity curves
 - Lift Off Curves
 - Thickness Curves
 - Clad thickness curves
 - Notch standard curves
- Prepare test Reports

EXAMINATIONS

- General
- Specific
- Practical Tests

Candidates must score a minimum of 70% in each test and a minimum of 80% average for all the three tests.



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