

Ultrasonic Testing

Level II

Training Course Outline

Prerequisite for this Class is Level I Ultrasonics

SCOPE

This course introduces the basic principles of ultrasonics and prepares the candidate for Angle Beam Inspections.

This course prepares a candidate to

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

TRAINING

Training Material is presented in Module that are followed by Quizzes

CERTIFICATION MODULE (Covered in Level I Training)

MODULE 1: MANUFACTURING DISCONTINUITIES (Covered in Level I Training)

MODULE 2: WAVE MODES (Covered in Level I Training)

MODULE 3: ACOUSTIC IMPEDANCE (Covered in Level I Training)

MODULE 4: REFRACTION AND REFLECTION (Covered in Level I and II)

- Reflection and Refraction
- Snell's Law
- Mode Conversion
- First and Second Critical Angle
- Creeping Waves
- Problems on Mode Conversion

MODULE 5: PIEZOELECTRIC TRANSDUCER (Covered in Level I Training)

MODULE 6: PULSER RECEIVER

- Calibration of Ultrasonic Equipment - Time and Amplitude Linearity
- All other Topics Covered in Level I Training

MODULE 7: ATTENUATION (Covered in Level I Training)

MODULE 8: THICKNESS MEASUREMENT (Covered in Level I Training)

MODULE 9: IMMERSION TESTING (Covered in Level I Training)

MODULE 10: FLAW DETECTION - 0 DEGREE (Covered in Level I Training)

MODULE 11: CALIBRATION BLOCKS

- IIW Block Type I
- IIW Block Type II
- Miniature Angle Beam / Rompass Block
- DSC Block
- AWS Resolution Block
- Step Wedge
- Area- Amplitude Block
- Distance- Amplitude Block

MODULE 12: ANGLE BEAM INSPECTION

- Selection of Screen Range
- Measurement of Beam Exit Point
- Measurement of Actual Refracted Angle
- Calibration using IIW, Rompass and DSC Block
- Sensitivity and Resolution
- Reference Amplitude
- Distance Amplitude Correction Curve
- Distance Gain Size
- Discontinuity Length Sizing using 6 dB and 20 dB drop method
- Discontinuity Evaluation
- Angle Selection
- Surface Distance, Skip Distance, Depth, Full V Path
- Plotting of Discontinuities like Crack, Lack of Fusion, Lack of Penetration, Slag, Porosity in welds
- Worksheet: Plotting of discontinuities for butt welds

MODULE 13: WRITING AN ULTRASONIC PROCEDURE

- ASME Section V
- Essential Variables
- Non Essential Variables

MODULE 14: CODES AND STANDARDS

- ASME Section V, Article 4, 2004 Edition
 - ASME Section VIII
 - SA 609 Castings
 - SA 388 Heavy Steel Forging
 - SA 578 Straight Beam Inspection of plain and Clad Steel Plates
- Additional Codes Standards as per student's requirements (please discuss this at the time of registration)

INTRODUCTION TO ADVANCED TECHNIQUES

Time of Flight Diffraction

Phased Arrays

PRACTICALS

Shear Wave Testing on API Pipe Samples with Weld defects – ID Cracks, OD Cracks, Slag, Porosity, Lack of Fusion, Lack of Penetration

EXAMINATIONS

General

Specific

Practical

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

Birring NDE Center, Inc.

832 533 8366

www.nde.com/training