

Visual Testing

Level I and II - 24 hours

Training Course Outline

SCOPE

This in-depth course prepares a candidate to conduct Visual Examinations.

This course prepares a candidate to

- Identify defects
- Interpret and Evaluate Results with respect to Applicable Codes, Standards and Specifications
- Write test reports

TRAINING

Training material is presented in modules that are followed by quizzes

PERSONNEL CERTIFICATION

ASNT SNT-TC-1A 2020

Training, experience and examination requirements

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

GENERAL TRAINING

The course curriculum includes:

Module 1: Welding Methods

- Welding Positions – 1G, 2G, 3G, 4G, 5G and 6G
- Welding processes:
 - GTAW – Gas Tungsten Arc Welding
 - GMAW - Gas Metal Arc Welding
 - SMAW – Shielded metal Arc Welding
 - SAW – Submerged Arc Welding
 - FCAW – Flux Core Arc Welding

Module 2: Welding Joints and Symbols

- Weld nomenclature (parts of a weld)
- Welding joints
- Welding symbols

Module 3: Welding Process Control

- WPS – Welding Procedure Specification
- PQR – Procedure Qualification Record
- WPQ – Welder performance Qualification

Module 4: Weld Profile and Discontinuities

- Hi-Lo, Underfill, Undercut, excessive reinforcement, Concavity
- Cracks, LOF, Lack of Penetration, Slag, Porosity, etc
- Undercut, melt-thru, burn thru, arc strikes

Module 5: Weld Inspection and Gauges

- Weld Profile measurements
- Weld inspection tools: Fillet weld gage, high-low gauge, V-Wac gauge

Module 6: Welding Codes & Standards

- AWS D1.1(steel)
- ASME Section I, V, VIII, 31.1, 31.3

Inspection acceptance criteria: ASME and AWS

Module 7: Machine Vision - Light, Illumination, and Eye

- Definition of Visual Testing
- Eye and Vision
- Lighting and its measurement - lux
- Machine vision and contrast

Module 8: Optical and Mechanical Aids

- Direct and Remote Inspection
- Videoscopes, fiberscopes and borescopes
- Field of View and Depth of View

Module 9: Discontinuities – Inherent and Processing

- Inherent and Processing Discontinuities
- Casting and its defects
- Forging, rolling, drawing and defects
- Surface Texture

Module 10: Discontinuities – Service Induced

- Damage mechanisms
- Overload and Fatigue
- Corrosion
- Erosion
- Wear

Module 11: Bolts, Pumps, Valves and Supports

- Pumps and valves
- Corrosion
- Cavitation

Module 12: Visual Inspection of Composites and Ceramics

- Composites
- Ceramics
- Coatings
- Ropes and Slings

Module: MIL STD/NAVSEA Codes – As needed

- MIL-STD 2035A Class 3 Acceptance Criteria

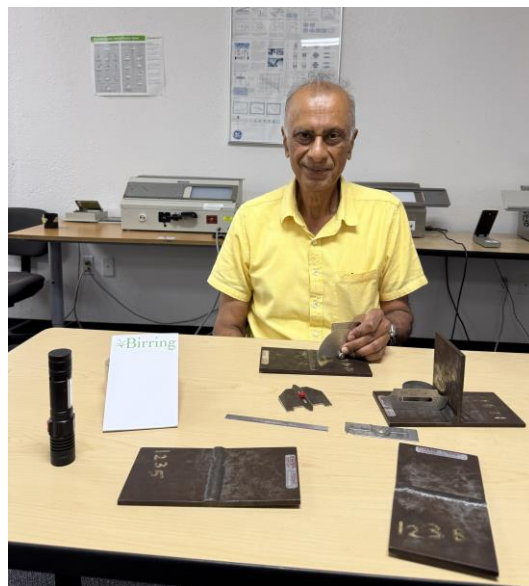
PRACTICAL TRAINING

- Evaluate defects in Weld Samples
- Weld Profile measurements with gauges

EXAMINATIONS

- General
- Specific
- Practicals

Candidates must score a minimum of 70 % in written tests, 80% in practicals, and a minimum of 80% average for all the three tests



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