

Non-Destructive Testing Courses by TCR Arabia (1/7)

Visual Testing Level II

Scope

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

- Setup and calibrate equipment
- Interpret and Evaluate Results with respect to Applicable Codes, Standards and Specifications
- Familiar with the scope and limitations of the Methods and ability to write test reports

General Training

Introduction

- Definition of visual testing.
- History of visual testing applications.
- Overview of visual testing applications.

Definitions

- Standard terms and their meanings in the employer's industry

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Visual Testing Level II

Fundamentals

- Vision
- Lighting
- Materials attributes
- Environmental factors
- Visual perception
- Direct and indirect methods

Equipments (as applicable)

- Mirrors
- Magnifier
- Borescopes
- Fiberscopes
- Closed-circuit television
- Light sources and special lighting
- Gages, templates, scales, micrometers, calipers, special tools, etc.

- Automated System
- Computer-enhanced systems

Manufacturing Processes

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

In-Service Defects

- Fatigue
- Corrosion
- Wear

Welding

- Expectations of a weld
- Welding terms

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Visual Testing Level II

- Welding processes: SMAW, GTAW, GMAW, & FCAW
- Welding codes: ASME, AWS, API and NBIC
- Welding filler materials (F and A numbers)
- Base materials (P numbers)
- Weld nomenclature (parts of a weld)
- Welding joints
- Welding symbols
- Welding defects: Their causes, detection, repairs, and prevention
- Inspection acceptance criteria: ASME and AWS
- What is the purpose of a visual welding inspector ?
- Weld inspection tools: Fillet welds gage, high-low gage, stud weld test gage, etc.

- Heat treatments
- Pumps and Valves
- Bolting

Employer-Defined Application

- (Includes a description of inherent, processing and service discontinuities)
- Materials-based materials
- Metallic materials, including welds.
- Organic-based materials
- Other materials (employer-defined)

Visual Testing to specific procedures

Selection of parameters

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Visual Testing Level II

- 1) Inspection objectives
 - 2) Inspection checkpoints
 - 3) Sampling plans
 - 4) Inspection patterns
 - 5) Documented procedures
- Test standards/calibrations
 - Classification of indications per acceptance criteria
 - Reports and documentation.

Vision

- The eye
- Vision Limitations
- Disorders
- Employer's vision examination methods

Lighting

- Fundamentals of light
- Lighting measurements
- Recommended lighting levels
- Lighting techniques for inspection

Materials Attributes

- Cleanliness
- Color
- Condition
- Shape
- Size
- Temperature
- Texture
- Type

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Environmental and Physiological Factors

- Atmosphere
- Cleanliness
- Comfort
- Distance
- Elevation
- Fatigue
- Health
- Humidity
- Mental attitude
- Position
- Safety
- Temperature

Visual Perception

- What your eyes see
- What your mind sees
- What others perceive

- What the designer, engineer, etc. wants you to see

Equipments

- Automated systems
- Borescopes
- Close-circuit television
- Computer based systems
- Fiberscopes
- Gages, micrometers, calipers, templates, scales, etc.
- Imaging systems
- Light sources and special lighting.
- Magnifiers
- Mirrors
- Special optical systems
- Standard lighting

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Visual Testing Level II

Employee-Defined Application

- Mineral-based material
- Metallic materials(including welds)
- Organic-based materials
- Other materials and products(employer defined)

Acceptance/Rejection Criteria

- Subjective basis (qualitative)
- Objective basis (quantitative)
- Evaluation of results per acceptance criteria.

Recording and Reports

- Subjective methods
- Objective methods
- Recording methods

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Visual Testing Level II

SPECIFIC TRAINING

Visual Inspection Codes

- AWS D1.1 (steel), D1.2 (Aluminum)
- ASME Section I, V, VIII, 31.1, 31.3

PRACTICAL TRAINING: Evaluate defects in Weld Samples

EXAMINATIONS

- General
- Specific
- Practical Tests

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

The duration of this course is for 3 days and it is conducted by NDT experts from TCR Arabia. Students will be given an ASNT Level II certificate at the end of this course.

All courses, unless specified in advanced with the client, will be conducted at the training facility located at: **TCR Arabia Limited I Gas Gardens, King Abdulaziz Seaport, Dammam, Saudi Arabia**