

Non-Destructive Testing Courses by TCR Arabia (1/6)

Liquid/Dye Penetrant Testing – Level I and Level II

Scope

This course covers the principles of Liquid Penetrant Testing 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
- Write test reports

Training

Training Material is presented in Module that are followed by Quizzes

General Training

Personnel Certification: ASNT SNT-TC-1A

MODULE 1: MANUFACTURING DISCONTINUITIES

- Types of Discontinuities: Inherent, Processing and Service
- Casting Discontinuities: Hot Tear, Cold Shut, Porosity, Shrinkage
- Primary Processing Discontinuities including discontinuities in Rolling, Forging, Drawing, Extruding

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- Secondary Processing Discontinuities including discontinuities in Grinding, Heat Treating, Machining, Welding, Plating
- Service Discontinuities: Erosion, Wear, Fatigue, Corrosion, Creep, Hydrogen Attack

MODULE 2: PRINCIPLES

- Purpose of Liquid Penetrant Testing
- Physical Principles
- Wetting Characteristics and Contact Angle
- Wetting Ability
- Force of Cohesion and Surface Tension
- Capillary Action
- Viscosity
- Application of Penetrant: Dwell Time
- Reversed Capillary Action
- Visibility of Indication
- Categories of Test Processes

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- Types of Dye: Type I and Type II
- Methods of Removal of excess Penetrant including Water Washable, Emulsifiers and Solvent Removable
- Sensitivity Levels – ½, 1, 2, 3, 4
- Selection of Process
- Limitations of Penetrant Testing

MODULE 3: BASIC STEPS

This module covers the basic steps involved in the following processes

- Method A – Water Washable
- Method B – Lipophilic Emulsifier
- Method C – Solvent Removable
- Method D – Hydrophilic Emulsifier

MODULE 4: PRE AND POST CLEANING

- Choice of Cleaning Method
- Different Cleaning Methods including Detergent, Solvent, Alkaline, Steam, Ultrasonic cleaning, Vapor Degreasing

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MODULE 5: APPLICATION OF PENETRANTS AND DEVELOPERS

- Different ways of applying penetrants
- Standard Temperature Limits
- Dwell time
- Drying
- Drying Parameters
- Drying Time Limits
- Application of Developers
- Types of Developers
- Developing Time
- Fluorescent Inspection
- Black Light, Black Light Warm Up Time,
- Visual Adaptation
- Post Cleaning

MODULE 6: INTERPRETATION

- Interpretation of Test Results
- Flow Chart for Interpretation

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- Types of Indications like True, False, Relevant and Non Relevant indications
- Categories of Indications: - Rounded and Linear
- Evaluation of Indications
- ASTM E-433 Reference Photographs of Indications types

MODULE 7: CODES & STANDARDS (SPECIFIC TRAINING)

Codes

- ASME Section V, Article 6
- ASME Section VIII, Appendix 8 (Accept/Reject Criteria)

Standards

- ASTM E-165
- ASTM E –1417

Other codes and standards can be discussed at the request of the students. Please make such requests at time of registration

PRACTICAL TRAINING

Visible: Solvent Removable

Fluorescent:

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Liquid/Dye Penetrant Testing – Level I and Level II

- Water Washable
 - Solvent Removable
 - Emulsifier both Hydrophilic and Lipophilic
- Tests on 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**