

Liquid Penetrant Training--Level I & II

Course Outline

1. Introduction

- * NDT Introduction
- * A Brief History Of Liquid Penetrant

2. Basic Principles of Liquid Penetrant Inspection

- * Why penetrant testing is used and works
- * What penetrant testing is used on and reveals
- * Visual Acuity

3. Basic Steps of Liquid Penetrant Processing

- * Parts Preparation
- * Application Of Penetrant
- * Removal Of Excess Penetrant
- * Application Of Developer
- * Inspection
- * Post Cleaning

4. Types of Penetrants Currently Used

- * Commonly Used Penetrant Materials
- * Some "Special" Penetrant Materials
- * Precautions Regarding Penetrant Materials
- * Safety Precautions Involved With Different Materials And Applications
- * Inspection Environments: Requirements For Fluorescent Inspection, Requirements For Color Contrast Inspection, Requirements For Dual Mode Inspection.
- * Post Cleaning

5. Penetrant Testing Materials

- * Classification of Penetrant Materials
 - o Type 1 – Fluorescent
 - o Type 2 – Visible
- * Method Classification of Penetrants
 - o Method A - Water Wash
 - o Method B - Post Emulsifiable (Lipophilic)
 - o Method C - Solvent Removable
 - o Method D - Post Emulsifiable (Hydrophilic)
- * Removability For Each Method (Emulsifiers & Solvents) Developers (Forms)
- * Developers (Forms)
- * Parts Preparation

6. Methods & Techniques

- * Selection of Penetrant Technique
- * Penetrant Application & Dwell Time
- * Penetrant Removal Process
- * Use And Selection Of Developers
- * Advantages & Disadvantages

7. Inspection, Interpretation & Evaluation

- * Defined
- * Responsibilities Involved With Each
- * Use Of Codes And Standards
- * Interpretation Of Indications
- * Report Writing And Documentation

8. System Controls

- * Equipment
 - o Penetrants
 - o Emulsifiers
 - o Developers
 - o Cleaners

9. Laboratory Exercises

- * System Maintenance and Operational Checks
- * Technique Development and Applications
- * Parts Processing
- * Interpretation and Evaluation

10. Inspection Procedures & Standards

- * Understanding And Interpreting Specifications, Standards
- * Following Written Procedures
- * General Documentation Procedures and Record Keeping

11. Material Processes

- * Inherent Discontinuities
- * Processing Discontinuities
 - o Primary
 - o Secondary
- * In Service Discontinuities

12. Liquid Penetrant Test Equipment & Accessories

- * Portable, Stationary Units and Set Up
- * Blacklight and Electro-Magnetic Spectrum
- * Pressure and Temperature Controls

- * Performance Checks and Requirements
- * Specialized Penetrant Equipment and Chemicals
- * Choice Of Method and Technique Development