LETSGLOBAL

life extension of technical structures

5-Day Ultrasonic Peening Qualification Course- Full Program

This 5-day on-site Ultrasonic Peening Qualification Course provides technicians, welders, inspectors, and engineers with complete theoretical and practical training in Ultrasonic Peening. LETS Global supplies all UP equipment during the course and trains participants in equipment functions, components, configuration, inspection, and routine maintenance.

DAY 1 – Fundamentals & Equipment Introduction

Morning Session

- Course introduction and safety briefing
- Fundamental principles of Ultrasonic Peening (UP/UIT)
- Fatigue mechanisms in welded structures
- Review of surface treatment technologies

Midday Session – UP Equipment Introduction (Hands-on)

- Overview of UP system components:
  - – Ultrasonic generator
  - – Transducer
  - – Resonator / sonotrode
  - – Peening pins / needles
  - – Cables and connectors
- Demonstration of UP system assembly and function
- Understanding amplitude, frequency, and energy transfer

Afternoon Session – Equipment Care & Maintenance

- Daily inspection routines
- Pin set selection and replacement
- Safe handling and storage of UP tools
- Troubleshooting common equipment problems
- Practical familiarization and low-energy operation

DAY 2 – Metallurgy, Microstructure & Parameter Control

Morning Session

- Metallurgical effects of UP: grain refinement, compressive stresses
- Microstructural transformations and fatigue-life benefits
- Review of industrial research and best practices

Midday Session – Parameter Selection

- Understanding amplitude, frequency, travel speed, and pin geometry
- Material-specific parameter selection
- Demonstration of parameter changes on sample plates

Afternoon Session – Practical Work

- Students practice UP on welded samples
- Measurement of weld-toe radius and groove geometry
- Instructor technique correction and feedback

DAY 3 – Application, Standards & Inspection Methods

Morning Session – Industrial Applications

- FPSOs, ships, rigs, bridges, cranes, offshore structures
- High-stress zone identification

- Review of defect cases and UP repair solutions

Midday Session – Standards and Compliance

- DNV, IIW, and classification requirements
- Documentation, traceability, and quality procedures
- Safety protocols and PPE review

Afternoon Session – Inspection Techniques

- Measuring UP effects:
  - Weld-toe geometry
  - Surface profile
  - Hardness testing
- Students perform full inspection on treated samples

DAY 4 – Advanced Practical Training & Troubleshooting

Morning Session – Instructor Demonstrations

- UP on complex geometries: fillet welds, T-joints, stiffeners, padeyes
- Groove consistency and defect avoidance

Midday Session – Troubleshooting Workshop

- Inadequate treatment indicators
- Technique refinement
- Equipment fault diagnosis and recovery

Afternoon Session – Independent Practical Training

- Students apply UP on structural assemblies
- Evaluation of technique, coverage, and parameter selection
- Preparation for qualification exam

DAY 5 – Qualification, Evaluation & Certification

Morning Session – Written Examination

- Theory, safety, parameters, standards, and quality requirements

Midday Session – Practical Qualification Test

- Students perform UP on assigned welded specimens
- Assessment based on:
  - Setup correctness
  - Parameter selection
  - Groove quality
  - Treatment uniformity
  - Safe operation

Afternoon Session – Review & Certification

- Instructor feedback and review
- Equipment maintenance recap
- Issuance of Ultrasonic Peening Operator Qualification Certificates