JUPITER PRIME
Consulting • Training • Advisory
جوبيتر برايم للاستشارات والتدريب

COURSE BROCHURE

Post-Weld Heat Treatment Planning and Monitoring Training Course

14 – 18 December 2026
Milan

Post-Weld Heat Treatment Planning and Monitoring Training Course

Ref: 1760_64597 **Date:** 14 – 18 December 2026 **Location:** Milan **Fees:** 7200 GBP

Post-Weld Heat Treatment Planning and Monitoring is a 1-week training course for welding engineers, inspectors and fabrication supervisors who specify, run and verify stress-relief cycles on pressure parts and piping, and who leave with a PWHT procedure and cycle record pack for their next job. Thicker sections and alloy steels make each cycle harder to control. Jupiter Prime Training presents this course on post-weld heat treatment planning and monitoring.

Why Post-Weld Heat Treatment Planning and Monitoring Matters Now

Three pressures shape post-weld heat treatment today. Plant owners are repairing ageing vessels and pipework in place, replacing the furnace with local heating. Fabricators face more chromium-molybdenum and thick carbon steel work, where a missed soak or a fast cool leaves hard, crack-prone welds. Inspectors and clients now expect a traceable chart for every joint. The course rests on the heat treatment clauses of the construction code each project applies, described in general terms.

Who Gains Most from Post-Weld Heat Treatment Planning and Monitoring

- Engineers responsible for writing heat treatment procedures and setting temperatures, holding times and rates
- Inspectors responsible for witnessing cycles and accepting charts and hardness results
- Supervisors responsible for scheduling heat treatment around welding, testing and shutdown sequences
- Heat treatment operators responsible for attaching thermocouples, wrapping heaters and running control units
- Quality staff responsible for filing cycle records and closing non-conformances

A fabrication shop or shutdown contractor gains most when its welding engineer, inspector and heat treatment crew attend together and agree one way to plan and record cycles.

Post-Weld Heat Treatment Planning and Monitoring Capabilities

Participants follow a weld from completion to the hardness reading that proves the cycle worked.

- Specify heating rate, soak temperature, holding time and cooling rate for a joint — procedure approval decisions
- Calculate heated band, soak band and gradient control band widths — heater layout choices
- Design thermocouple layouts that capture the hottest and coldest points — inspector acceptance
- Weigh resistance, induction and furnace heating for a given job — cost and schedule trade-offs
- Assess temperature charts for deviations and interruptions — repeat or accept decisions

- Test hardness on weld, heat-affected zone and parent metal — release of the joint to service

Key Post-Weld Heat Treatment Planning and Monitoring Terms

- Post-Weld Heat Treatment PWHT — controlled reheating of a completed weld to relieve residual stress and temper hard microstructures.
- Soak Band — the zone around the weld held at the specified temperature for the required holding time.
- Gradient Control Band — the insulated area beyond the heated band that limits axial temperature differences and induced stress.
- Holding Time — the period the soak band stays within the temperature range.
- Heat-Affected Zone — parent metal next to the weld whose structure changed during welding without melting.
- Temper Bead Repair — a welding technique used where heat treatment is impractical, relying on controlled bead placement.

Post-Weld Heat Treatment Planning and Monitoring Day by Day

Day 1: Residual Stress and Metallurgy

- Residual Stress Formation in Welds — Need for Stress Relief
- Carbon, Alloy and Stainless Steel Responses — Material Grouping Choices
- Hardness and Toughness in the Heat-Affected Zone — Cracking Risk
- Code Exemptions by Thickness and Material — When PWHT Is Required
- Vessel and Pipeline Repair Cases — Lessons from Two Sectors

Day 2: Heating Methods and Equipment

- Flexible Ceramic Resistance Heaters — Pad Selection and Layout
- Induction Heating Coils and Power Units — Fast Uniform Heating Choices
- Furnace and Internal Firing Options — Whole Component Treatment
- Insulation Blankets and Closure of Open Ends — Heat Loss Control
- Control Units and Power Rating Checks — Zone Count Planning

Day 3: Temperature Measurement

- Thermocouple Types and Attachment by Capacitor Discharge — Reading Accuracy
- Control and Monitoring Thermocouple Positions — Hot and Cold Spot Capture
- Heated, Soak and Gradient Band Calculation — Band Width Decisions
- Chart Recorders and Digital Loggers — Traceable Cycle Evidence
- Thermocouple Failure During a Cycle — Continue or Restart Decision

Day 4: Cycle Control and Verification

- Heating and Cooling Rate Limits — Thermal Stress Control
- Soak Temperature Tolerance and Holding Time — Chart Acceptance Criteria
- Portable Hardness Testing Methods — Weld, Zone and Parent Readings
- Deviation Handling and Repeat Cycles — Non-Conformance Closure
- Alternatives Such as Temper Bead Repair — Where PWHT Is Impractical

Day 5: Practising the PWHT Procedure and Record Pack

- Joint Data Sheet for a Thick Nozzle Weld — Applying Day 1 Metallurgy
- Heater and Insulation Layout Drawing — Applying Day 2 Methods
- Thermocouple Map and Band Sizing — Applying Day 3 Calculations
- Simulated Chart Review with Hardness Results — Accept or Repeat
- PWHT Procedure and Cycle Record Pack — Sign-Off Ready Document

Applying Post-Weld Heat Treatment Planning and Monitoring After the Course

- Audit thermocouple layouts on the next three local heat treatment jobs against the band calculations taught.
- Rebuild the site heat treatment chart template so every record shows rates, soak, hold and hardness on one sheet.

Post-Weld Heat Treatment Planning and Monitoring Questions FAQ

What is post-weld heat treatment planning and monitoring and why does it matter now?

It is the specification, control and recording of reheating cycles that relieve stress in completed welds. It matters now because more repairs are heat treated in place, alloy work is growing and clients expect a traceable chart for every joint.

Which roles gain most from post-weld heat treatment planning and monitoring?

Welding engineers, inspectors and fabrication supervisors gain most. Heat treatment operators and quality staff also benefit because thermocouple placement and chart filing decide whether a cycle is accepted.

How does post-weld heat treatment planning and monitoring differ from a general welding inspection course?

It concentrates on the thermal cycle after welding rather than weld visual and volumetric inspection. Heater layout, band sizing, chart review and hardness verification form the core.

What do you bring back from post-weld heat treatment planning and monitoring training?

You bring back a procedure and record pack for a real joint. It holds cycle parameters, layouts and acceptance rules.

Post-Weld Heat Treatment Planning and Monitoring: The Way Forward

The PWHT procedure and cycle record pack first informs whether a repair weld can be heat treated in place or needs another route. Engineers, inspectors and heat treatment crews use it as one reference. After its first use, revisit the recorded gradients and hardness readings to tighten band widths and heating rates for similar joints.