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COURSE BROCHURE

Process Piping Wall Thickness and Flexibility Design Training Course

15 – 19 February 2027
Vienna

Process Piping Wall Thickness and Flexibility Design Training Course

Ref: 1690_61973 **Date:** 15 – 19 February 2027 **Location:** Vienna **Fees:** 6600 GBP

Process Piping Wall Thickness and Flexibility Design is a 1-week training course for piping designers, mechanical engineers and inspectors, and each participant completes a piping design compliance check for one line from their own plant. Expansions, tie-ins and higher operating temperatures keep pushing existing lines past their original design basis. Jupiter Prime Training delivers this process piping wall thickness and flexibility design course.

Why Process Piping Wall Thickness and Flexibility Design Matters Now

Three pressures shape piping design work today. Debottlenecking projects raise design pressure and temperature on lines that were sized for older duties. Owners and insurers ask for traceable calculations before a modified line returns to service. Engineering contractors work faster with leaner teams, so checks on thermal expansion, support loads and nozzle reactions are often squeezed. A line designed well runs for decades; a weak one leaks at flanges, cracks at branches or overloads pump nozzles. The course follows the process piping code of the international pressure piping code family, described in general terms, alongside allowable stress design and the stress intensification factor SIF method.

Who Gains Most from Process Piping Wall Thickness and Flexibility Design

- Designers who set line classes, wall thickness and branch reinforcement for new routes
- Mechanical engineers who check thermal expansion, support spans and equipment nozzle loads
- Inspectors who verify fabrication, examination and leak testing against design records
- Project engineers who approve piping changes during revamps and tie-ins

Engineering groups of operators and contractors gain most when designers and inspectors of the same unit attend together.

Process Piping Wall Thickness and Flexibility Design Capabilities

Participants follow one hot hydrocarbon line from its design conditions through pipe schedule, routing and supports to its hydrotest record.

- Specify design pressure and temperature from process upset cases — process and line class owners
- Calculate pressure design wall thickness with corrosion and mill tolerance — material take-off and procurement
- Assess branch connections for area replacement and reinforcement — fabrication drawings
- Test layouts for thermal expansion using loops, offsets and expansion joints — routing decisions
- Weigh support spans, guides and anchors against equipment nozzle loads — rotating equipment owners

- Apply examination and leak test acceptance rules to a fabricated spool — inspection release

Key Process Piping Wall Thickness and Flexibility Design Terms

- Design Pressure — the most severe sustained pressure, with coincident temperature, that a piping component must withstand.
- Allowable Stress — the stress limit for a material at a given temperature, taken from the code's material tables.
- Mill Tolerance — the permitted undertolerance on pipe wall thickness from manufacturing, added to the calculated minimum.
- Displacement Stress Range — cyclic stress caused by thermal expansion and imposed movements, checked against an allowable range.
- Stress Intensification Factor SIF — a multiplier applied at fittings and branches to reflect local fatigue weakness.
- Hydrostatic Leak Test — a pressure test with water at a factor above design pressure to prove joint and component tightness.

Process Piping Wall Thickness and Flexibility Design Day by Day

Day 1: Code Scope and Design Conditions

- Code Scope and Fluid Service Categories — Which Rules Apply
- Design Pressure and Temperature Selection — Upset and Startup Cases
- Allowable Stress Tables and Weld Joint Factors — Material Limits
- Line Class and Piping Specification Structure — Standardised Component Choice
- Pressure-Temperature Ratings of Flanges and Valves — Rating Class Selection

Day 2: Wall Thickness and Components

- Pressure Design Thickness Formula — Minimum Required Wall
- Corrosion, Erosion and Thread Allowances — Added Thickness Decisions
- Mill Tolerance and Pipe Schedule Selection — Ordered Wall Thickness
- Branch Connection Area Replacement — Reinforcement Pad Need
- Blanks, Reducers and Closures — Non-Listed Component Qualification

Day 3: Flexibility and Supports

- Thermal Expansion Calculation — Movement at Equipment and Anchors
- Sustained and Occasional Load Limits — Weight, Wind and Seismic Cases
- Displacement Stress Range and SIF Method — Fatigue at Fittings
- Expansion Loops, Offsets and Bellows — Routing Choices for Hot Lines
- Support Spans, Guides and Spring Hangers — Nozzle Load Protection

Day 4: Materials, Fabrication and Testing

- Material Toughness and Low-Temperature Limits — Impact Testing Need
- Welding Procedure and Welder Qualification Records — Fabrication Release
- Preheat and Post-Weld Heat Treatment Rules — Thickness and Material Triggers
- Examination Types and Random Sampling — Acceptance of Welds
- Hydrostatic and Pneumatic Leak Test Rules — Test Pressure and Safety

Day 5: Practising the Piping Design Compliance Check

- Design Condition Exercise for a Refinery Hydrotreater Line — Upset Case Choice
- Wall Thickness Drill for a Gas Plant Header — Schedule Confirmation
- Flexibility Review of a Pump Discharge Line — Nozzle Load Check
- Test Pack Audit for a Chemical Plant Spool — Examination Gaps
- Piping Design Compliance Check — Conditions, Thickness, Flexibility and Testing

Applying Process Piping Wall Thickness and Flexibility Design After the Course

- Recheck the wall thickness and branch reinforcement of one line affected by a planned revamp.
- Review the support and guide layout of one hot line against measured thermal movement.

Process Piping Wall Thickness and Flexibility Design Questions FAQ

What is Process Piping Wall Thickness and Flexibility Design and why does it matter now?

It is the code-based sizing of pipe walls and the check that a line can absorb thermal movement safely. Revamps and higher duties make both checks frequent on existing plants.

Which roles gain most from Process Piping Wall Thickness and Flexibility Design?

Piping designers, mechanical engineers, inspectors and project engineers who size, route, support or release process lines gain most.

How does Process Piping Wall Thickness and Flexibility Design differ from a boiler and pressure vessel code course?

It concentrates on process piping alone, working through thickness, branch reinforcement and flexibility calculations rather than surveying several equipment codes at once.

What do you bring back from Process Piping Wall Thickness and Flexibility Design?

You bring back a completed compliance check for one line, covering design conditions, thickness, flexibility, supports and leak testing, ready to reuse.

Process Piping Wall Thickness and Flexibility Design: The Way Forward

The piping design compliance check gives each engineer one record linking design conditions, wall thickness, flexibility and testing for a line. Its first use is deciding whether a revamped line keeps its schedule or needs replacement. Designers and inspectors share it at design review and test release. After first use, revisit how support changes alter nozzle loads.