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COURSE BROCHURE

# Pipe Restraint Layout and Spring Hanger Sizing Training Course

8 – 12 March 2027
London

# Pipe Restraint Layout and Spring Hanger Sizing Training Course

**Ref:** 2463_93159 **Date:** 8 – 12 March 2027 **Location:** London **Fees:** 5900 GBP

Pipe Restraint Layout and Spring Hanger Sizing is a 1-week training course for piping, mechanical and support engineers who turn line routing, weights and thermal movement into a pipe support selection sheet for a process line. Plants are being debottlenecked, re-routed and extended on tight shutdown windows, so every shoe, guide and hanger has to be right first time on the rack. Jupiter Prime Training delivers this Pipe Restraint Layout and Spring Hanger Sizing course.

## Why Pipe Restraint Layout and Spring Hanger Sizing Matters Now

Three forces shape restraint layout today. Brownfield tie-ins push new lines onto crowded racks where spans, clearances and steel capacity are already used. Hotter, cyclic services from heat integration and intermittent operation raise the vertical travel that springs must absorb. A plant that places restraints well avoids sagging lines, lifted shoes and overloaded rack beams; poor placement brings vibration, flange leaks and field rework. The course rests on the published pipe support codes of the piping design community, described in general terms.

## Who Gains Most from Pipe Restraint Layout and Spring Hanger Sizing

- Engineers who route lines across racks and platforms
- Engineers who check line weights, thermal displacements and restraint loads before issue
- Engineers who specify shoes, trunnions, clamps and spring units for purchase
- Engineers who pass rack steel loads to structural teams
- Engineers who review supports during construction and turnarounds

A layout group that sends its routing, support detailing and structural interface engineers together gains most.

## Pipe Restraint Layout and Spring Hanger Sizing Capabilities

Participants place restraints along a routed line and turn loads into sized spring units.

- Calculate allowable support spans — rack layout and beam spacing
- Specify anchors, line stops, guides and resting shoes — routing reviews with the layout lead
- Size variable and constant spring hangers from load and travel — vendor enquiries and purchase orders
- Weigh friction, slide plates and lift-off at hot restraints — structural engineers checking rack beams
- Build restraint load summaries for rack steel and foundations — civil and structural designers
- Communicate support selections through a standard data sheet — fabricators, inspectors and site supervisors

## Key Pipe Restraint Layout and Spring Hanger Sizing Terms

- Support span — the largest distance between two rigid supports that keeps sag within the line limit.
- Line stop — a restraint that blocks axial movement in one or both directions.
- Variable spring hanger — a coil spring support whose load changes as the pipe moves vertically between cold and hot positions.
- Constant spring hanger — a support to hold almost the same load through its full travel.
- Load variation — the difference between hot and cold spring load.
- Pipe shoe — a welded or clamped element that lifts the pipe off the steel and transfers load to the beam.

## Pipe Restraint Layout and Spring Hanger Sizing Day by Day

### Day 1: Routing, Racks and Restraint Intent

- Plot Plan and Rack Arrangement — Where Lines Can Be Restrained
- Line Designation Tables — Temperature, Pressure and Insulation Inputs
- Equipment Connection Points — Fixed Points the Routing Must Respect
- Operating, Hydrotest and Upset Cases — Which Load Governs Supports
- Restraint Intent Markup — Agreeing Where Movement Is Allowed

### Day 2: Weight, Spans and Rigid Supports

- Allowable Span Tables — Beam Spacing for Small and Large Bore
- Concentrated Masses at Valves and Flanges — Extra Supports Needed
- Shoes, Saddles and Trunnions — Matching Attachment to Insulation Thickness
- Clamps Versus Welded Attachments — Alloy, Lining and Fabrication Limits
- Vertical Riser Supports — Carrying Weight at Platforms and Nozzles

### Day 3: Guides, Line Stops and Anchors

- Thermal Growth Direction — Choosing Guide and Line Stop Positions
- Guide Spacing on Long Runs — Controlling Bowing and Wind Loads
- Directional Anchors at Expansion Loops — Splitting Movement Between Legs
- Friction and Slide Plates — Lowering Lateral Load on Rack Beams
- Gaps, Lift-Off and Hold-Down — Keeping Contact at Hot Restraints

### Day 4: Spring Unit Sizing and Selection

- Hot and Cold Load Derivation — Setting the Spring Working Range
- Variable Spring Size Charts — Spring Rate and Load Variation Limit
- Constant Hanger Selection — When Travel Makes Variable Springs Unsuitable
- Rod, Lug and Bottom Mounted Arrangements — Fitting the Available Headroom
- Travel Stops, Preset Load and Load Scales — Commissioning and Hydrotest Readiness

## Day 5: Practising the Pipe Support Selection Sheet

- Span and Shoe Checks on a Case Line — Applying Rigid Support Rules
- Guide and Anchor Placement Review — Applying Movement Control Choices
- Spring Unit Sizing Exercise — Applying Hot and Cold Load Results
- Restraint Load Summary for Rack Steel — Handing Loads to Structural Design
- Pipe Support Selection Sheet — Completing Types, Loads and Travels per Node

## Applying Pipe Restraint Layout and Spring Hanger Sizing After the Course

- Lead a span and shoe check on one existing rack line.
- Rebuild the spring hanger data for one hot line against load scale readings.

## Pipe Restraint Layout and Spring Hanger Sizing Questions FAQ

### What is pipe restraint layout and spring hanger sizing and why does it matter now?

It is the work of placing supports along a routed line and sizing the springs that carry moving weight. Crowded racks and hotter services make wrong supports a cause of leaks and rework.

### Which roles gain most from pipe restraint layout and spring hanger sizing?

Engineers who route lines, detail supports and pass loads to structural teams gain most. Refinery and petrochemical layout groups use the methods daily.

### How does pipe restraint layout and spring hanger sizing differ from a stress analysis course?

It concentrates on choosing and sizing the physical support hardware rather than building analysis models. Stress results are treated as inputs.

### What do you bring back from pipe restraint layout and spring hanger sizing?

You bring back a completed support selection sheet for a case line. It lists each node with support type, attachment, design load, hot and cold spring loads and travel.

## Pipe Restraint Layout and Spring Hanger Sizing: The Way Forward

The pipe support selection sheet built in class first informs the next rack routing review, where layout and structural engineers agree support positions before steel is ordered. After its first use, revisit the spring travel and preset load assumptions, and the guide gaps on the hottest runs, once operating temperatures are confirmed during start-up.