



Expansion Joint Design & Application

30 Sep - 11 Oct 2024
Lisbon (Portugal)



Expansion Joint Design & Application

Ref.: 15159_248044 **Date:** 30 Sep - 11 Oct 2024 **Location:** Lisbon (Portugal) **Fees:** 7800 Euro

Introduction:

We will speak in this course is the subsequent topics: Expansion joint design, the various sorts of expansion joints, metallic bellows vs. fabric bellows, fabric expansion joint design, expansion joint stress analysis, equilibrium and anchor forces, field services, and detailed info on the factory where our expansion joints are created.

Target Audience:

- Process, Mechanical, and Chemical Engineers.
- Operation and Maintenance Engineers.
- Project Engineers.
- Supervisors and Managers.
- Technical Personnel involved in the inspection.

Course Objectives

At the end of this course the participants will be able to:

- Increase the awareness and understanding of mechanical integrity of process equipment and piping systems depends jointly on the proper design, operation, condition assessment, and maintenance of the equipment, underscoring their vital individual and team roles in managing change.
- Get practical and sound methods and tools to enable them to carry out basic design calculations for pressure equipment following applicable industrial codes, standards, and best practices.
- Get a clear understanding of the degradation mechanisms that process equipment could be subjected to over their operating life, how to identify them, predict and determine their impact, and what appropriate measures can be taken to prevent and control the resultant damage.
- Gain the knowledge and failure analysis skills they need to conduct damage and failure analysis to prevent similar failures from happening.
- Enhance the knowledge and skills in hazard identification and analysis, and risk assessment and management.

Targeted Competencies:

- Introduction - Overview of Piping.
- Preliminary Piping Design - Piping System Components.
- Preliminary Piping Design - The Total System.
- Basic Concepts of Stress Analysis - Flexibility Analysis.
- Basic Concepts of Stress Analysis - Design Bases.
- Influences on Pipe Support Design - Rigid Supports.
- Influences on Pipe Support Design - Spring Supports.
- Influences on Pipe Support Design - Restraints.

Course Content:

Unit 1: Introduction - Why Expansion Joints:

- Thermal Expansion of pipes
- Piping system designer tools
- Steps to acquire a metal bellows expansion joint
- A US Bellows example job

Unit 2: System Design: Anchors, Guides, and Expansion Joints:

- Metal expansion joints
- Types and applications
- Single bellows
- Multiple bellows
- Slip type

Unit 3: Fabric Expansion Joints and Bellows Geometry:

- Refractory lined expansion joints
- Metal bellows convolution parameters
- Software and Databases
- Bellows instability & cycle life
- Fabric expansion joints

Unit 4: Fabric Expansion Joints:

- Metallic vs. Fabric
- Fabric materials
- Importance of the belt

Unit 5: Expansion Joint Stress Analysis:

- Metallic bellows materials
- Metallic bellows geometry
- Type of stresses in metal bellows
- Design considerations

Unit 6: Forces and Movements

Forces and moments on piping systems due to spring and pressure forces of Metal Expansion Joints:

- Equilibrium Conditions
- Main Anchors
- Anchor Force Calculations



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Unit 7: Field Services

Planning major turnarounds and Emergency shutdowns:

- Inspection
- Turnarounds
- Unscheduled Maintenance
- Field Services

Unit 8: Course Conclusion:

- Houston plant facilities
- Business concerns
- Quality Control



**Registration form on the :
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