



Conference:
Fundamentals of Mechanical Technology

12 - 16 April 2027
Madrid (Spain)

Conference: Fundamentals of Mechanical Technology

Conference code: CO8048 From: 12 - 16 April 2027 Venue: Madrid (Spain) - Conference Fees: 6300 € Euro

Introduction

Mechanical engineering is at the center of the chemical, oil, gas, and petrochemical industries. It requires familiarity not only with sound engineering principles but also with other engineering techniques including inspection, monitoring, and condition evaluation. The mechanical engineer is interested in safe containment and movement of solids, liquids, and gases. Of specific importance are material properties, design, static & rotating equipment design, inspection, and repair as well as an understanding of maintenance strategies and condition monitoring.

Objectives

By the end of this seminar, participants will be able to:

- Understand fundamental mechanical engineering principles used in industrial facilities
- Identify material properties, stress behavior, and common failure mechanisms
- Apply appropriate material selection methods for industrial applications
- Recognize inspection techniques and condition evaluation methods
- Understand piping systems, valves, pipelines, and fitness-for-service concepts
- Identify corrosion types, monitoring methods, and corrosion prevention techniques
- Understand compressor types, operation, and maintenance requirements
- Improve maintenance strategies and condition monitoring practices
- Apply industry codes and standards including ASME & API
- Enhance equipment reliability, safety, and operational performance

Target Audience

- Mechanical Engineers
- Maintenance Engineers
- Inspection Engineers
- Reliability Engineers
- Piping & Pipeline Engineers
- Plant Engineers
- Operations & Technical Personnel
- Oil, Gas & Petrochemical Professionals
- Asset Integrity & Condition Monitoring Specialists

Outlines

Day 1: Introduction & Fundamentals

- Engineering Material Properties
 - Stress and Strain
 - Fracture failure, Modes, Stress concentration, Fracture toughness
 - Fatigue failure, testing and mechanism

- Temperature Considerations and Creep Failure
- Identification of Damage Mechanisms
- Mechanical Design
- ASME & API
- Codes & Standards
- Design for static strength

Day 2: Materials Selection and Inspection

- Materials Selection
 - Materials of Construction
 - Carbon Steels
 - Alloy Steels
 - Stainless Steels
 - Nickel Based and Titanium Alloys
- Inspection techniques
- Visual
- Penetrant
- Magnetic Flux
- Eddy Current Inspections
- X-Ray & Gamma ray
- Ultrasonics - TOFD & Pulse-Echo

Day 3: Valves, Piping & Fitness for Service

- Valves
 - Valve Types
 - Valve Characteristics
 - Valve Applications
 - Valve Selection
 - Valve Actuators
- Piping & Pipelines
- ASME B31
- Pipe Types, construction and Schedules
- Steel Pipes
- Welded Types and Sections
- Flanges and Gaskets
- Plastic Pipes, Composite Pipes
- Pipe Coatings and Linings
- Pipe Supports and insulation blocks
- Stress relief in Piping Design
- Pigging
- Water hammer
- Overview of API 570 - Inspection & repair of Pipelines & Piping
- API 579 overview
- Fitness for Service

Day 4: Corrosion

- Corrosion Fundamentals
- Types of Corrosion
- Corrosion Inspection and Monitoring

- Corrosion Minimization
- Coatings
- Inhibitors
- Cathodic Protection

Day 5: Compressors

- Types of Compressors - Reciprocating, Centrifugal and Screw
- Blading and Staging
- Performance Curves
- Compressed Air Usage and instruments
- Glands and Mechanical Seals

Mechanical Maintenance

- Strategies & Philosophies
 - Maintenance system optimisation
 - Maintenance Management Systems
- Condition Monitoring
- Vibration Analysis
- Shaft Alignment
- Practical Examples

Registration form on the Conference: Fundamentals of Mechanical Technology

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