



An Intensive 5-Day Online Training Course

Piping Material Selection & Rating Classification

WHO SHOULD ATTEND?

- Process engineers
- Chemical engineers
- Mechanical and structural engineers
- Operation personnel
- Engineers and consultants dealing with planning of new production lines and retrofitting plants

Date	Venue	Fee(\$)
12 - 16 Jun 2022	Live / Online	US\$ 2,400

INTRODUCTION

Compared with other forms of transport, pipelines allow a more continuous, stable, and high-capacity supply of hydrocarbons to reach end-users. Pipeline transportation has the advantages of being well established, efficient, cost-effective, and readily expandable.

The products carried in liquid pipelines include a wide range of materials. Process fluid systems gather production from onshore and offshore fields, while transmission lines transport them to terminals, interconnection points, and refineries.

Materials selection plays an important role in piping systems. It is crucial to select a piping material that can cope with a variety of applications and damage mechanisms including corrosion, high/low temperatures, constant and cyclic loads, etc. Pipe inspection also plays an important role, making sure that optimal materials requirements are adhered to.

This EuroMaTech online training course will combine the various disciplines of pipeline engineering, including design, structural integrity, hydraulic considerations, materials types and selection, inspection and maintenance as well as the applications of relevant codes such as ASME B31.3 and API 570.

This seminar will highlight:

- Main aspects of pipeline design and manufacturing considerations
- Knowledge of the governing principles, related to materials testing
- Relevant structural integrity, pipe failure and corrosion principles
- Main Types of pipeline materials and selection
- Relevant pipe inspection and maintenance techniques

Classroom
learning service
available



TRAINING METHODOLOGY

The course will be conducted along workshop principles with formal lectures and interactive worked examples included in several workshops. The emphasis in the course will be on the explanation of all technical phenomena and providing answers to problems that are encountered in everyday industrial practice related to the design and materials selection of pipeline systems.

Each learning point will be reinforced with practical examples. Computer simulations and videos will be used to illustrate the main aspects of the course. Delegates will receive electronic versions of the course material together with relevant computer simulations and videos.

There will be ample opportunities for active discussion and sharing professional experiences and exchange that will help solidify the gained knowledge.

PROGRAMME OBJECTIVES

At the end of this seminar, the participants will:

- Develop deep understanding & familiarity basic principles of pipeline design for various industrial applications.
- Be familiar with the practical aspects of structural integrity, related to pipeline operation
- Have a knowledge of the various types structural and corrosion failure in relation to process pipes
- Have the necessary knowledge about pipeline materials and selection
- Understand aspects of pipe inspection and maintenance practices

PROGRAMME SUMMARY

The seminar will allow participants to:

- Have a sound understanding of the properties and applications of materials with particular emphases on the oil and gas industries
- Have a good knowledge, understanding and be able to select major types of engineering metals, including, carbon steels, alloy steels, stainless steels, cast irons, titanium and nickel-based alloys
- Be able to select heat treatment processes and mechanical strengthening techniques for metals, in order to optimise their use in a variety of engineering applications
- Appreciate the selection of non-metals, including polymers that are used for corrosion protection coatings and liners.
- Have a working knowledge of;
 - » Corrosion issues
 - » Various types of corrosion
 - » Good appreciation of material selection as a method of corrosion control and mitigation
 - » Explain the mechanisms behind corrosion resistant materials
 - » Be able to evaluate the performance and the selection of materials, coatings and inhibitors for various situations involving corrosion
- Have a working knowledge and selection of materials for major failure and degradation mechanisms, including different types of stress, fracture, fatigue and elevated temperature conditions.
- Be knowledgeable in Non-Destructive Techniques (NDT)



+971 50 196 6003

Email Address:
info@euromatech.ae

Website:
www.euromatech.com

In-house Training

EuroMaTech is capable of conducting this training programme exclusively for your delegates. Please e-mail us on inhouse@euromatech.ae for further information and/or to receive a comprehensive proposal.

COURSE OUTLINE



Day 1

Overview of Pipelines and Materials Testing

- Overview of main elements of oil and gas pipelines and systems
- Types of Metallic pipes and main manufacturing techniques, seamless, continuous welded, etc.
- Flanges and Gaskets
- Mechanical Test Requirements
- Tensile testing
- Charpy Impact test
- Hardness testing

Day 2

Pipeline Materials and Requirements

- Ferrous alloys - Classification of carbon steels, Low-Carbon Steels, Medium-Carbon Steels, High-Carbon and tool Steels, Alloy Steels
- Micro-structure of carbon steel
- Alloying selection
- Heat treatment of steel, hardening of carbon steel (by quenching), annealing, hot working, service temperature
- Stainless Steel, Ferritic, Austenitic, Martensitic, Duplex Stainless Steel, full stainless steel technical data
- Cast Irons – types and selection.
- Nickel based alloys, selection for corrosion and elevated service temperature
- Titanium alloys - types of titanium alloys (, and) and selection of titanium alloys for corrosion resistance

Day 3

Mechanical Design Considerations

- Temperature variations expansion loops and expansion joints
- Stress analysis examples, thermal expansion
- Maximum allowable pressure and wall thickness calculations and corrosion allowance
- Welding types and requirements
- Heat Affected Zone (HAZ)
- Alternative materials, Glass Fibre Reinforced (GRP), Polyethylene pipes, etc.
- ASME B31 and materials related considerations

COURSE OUTLINE



Day 4

Failure Mechanisms, Corrosion Damage and Corrosion Mitigation

- Cyclic loading (Fatigue) damage of piping materials
- High temperature (Creep) failure of piping materials
- Corrosion principles and Electrochemical cell
- Types corrosion, uniform, bimetallic, hydrogen induced, erosion-corrosion, etc.
- Materials selection examples
- Cathodic Protection
- Coatings

Day 5

Pipeline Maintenance and Inspection

- Pigging methods for cleaning
- Pigging Inspection
- Hydro-testing
- Inspection (NDT) techniques, x-ray, ultrasonic, holiday detection, etc.
- Pipe repairs
- Overview of API 570 Pipe Inspection Code

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All Fees are subject to 5% Value Added Tax (VAT)*

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Please invoice my company as follows:

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Documentation

High Quality material has been prepared by the Seminar Leader for distribution to delegates.

Certificates

A Certificate of Completion will be issued to those who attend & successfully complete the programme.

Registration & Payment

Please complete the registration form on this page & return it to us indicating your preferred mode of payment.

For Further Information, email us at info@euromatech.ae.

Cancellation Policy

Request for seminar cancellation must be made in writing & received at EuroMaTech three weeks prior to the seminar date. A U.S.\$250/- processing fee will be charged per delegate for each cancellation. Thereafter, we regret that we are unable to refund any fees due, although in such cases we would be happy to welcome a colleague who would substitute for you.

Disclaimer

EuroMaTech reserves the right to alter the content, location of the Seminar, or the identity of the speakers in case of events beyond our control.

Contact Us:

Middle East Office:

P.O. Box 74693

Dubai, United Arab Emirates

Telephone: +971 4 4571 800

Fax: +971 4 4571 801

Email Address:

info@euromatech.ae

Website:

www.euromatech.com