

TRAINING TITLE

AMINE GAS TREATING

Training Duration

5 days

Training Venue and Dates

Ref. No. RT120	Amine Gas Treating	5	14-18 Apr. 2025	\$5,500	Abu Dhabi, UAE
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In any of the 4 or 5-star hotels. The exact venue will be informed later.

Training Fees

- \$5,500 per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Lunch

Training Certificate

Define Management Consultants Certificate of course completion will be issued to all attendees.

TRAINING DESCRIPTION

The Amine Gas Treating course is designed to provide participants with a comprehensive understanding of the principles, design, operation, and troubleshooting of amine gas treating systems. Amine gas treating is a widely used process in the oil and gas industry for removing acid gases like hydrogen sulfide (H₂S) and carbon dioxide (CO₂) from natural gas, refinery gas, and other industrial gas streams. This course will cover the chemistry behind amine absorption, system components, process design, operation, and maintenance best practices. Participants will also learn how to optimize amine systems and troubleshoot common issues to ensure efficient, safe, and cost-effective operation.

TRAINING OBJECTIVES

By end of course participants will be able to understand

- **Understand the Fundamentals of Amine Gas Treating:** Learn the basic principles of acid gas removal, including the role of amines in gas treatment.
- **Identify and Select Appropriate Amine Solutions:** Understand the different types of amines used and how to select the appropriate solution based on specific needs.
- **Learn the Design and Operation of Amine Gas Treating Systems:** Grasp the key design principles and operational procedures for amine units, including the components and their functions.

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- **Optimize System Performance:** Gain insights into operational strategies for optimizing amine treating system efficiency and preventing issues like foaming, corrosion, and degradation.
- **Troubleshoot Amine System Problems:** Identify common problems in amine systems (e.g., degradation, loss of capacity) and apply solutions to improve system performance.
- **Ensure Safety and Environmental Compliance:** Be aware of safety standards and environmental considerations related to amine gas treating.

WHO SHOULD ATTEND?

- Process engineers
- Chemical engineers
- Operations and maintenance personnel
- Plant managers and supervisors
- Safety officers
- Environmental engineers
- Engineering consultants and contractors.

TRAINING METHODOLOGY

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions and motivating everybody to find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work & Practical Exercises
- 20% Videos & General Discussions

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COURSE PROGRAM

Day 1: Introduction to Amine Gas Treating

- Overview of Amine Gas Treating
 - Definition and importance of acid gas removal

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- Common applications of amine gas treating (natural gas processing, refineries, petrochemical plants)
- **Basic Chemistry of Amine Gas Absorption**
 - Amine chemistry and the absorption process
 - Acid gas absorption: CO₂, H₂S, and other acid gases
 - Thermodynamics of gas absorption
- **Types of Amines**
 - Overview of amine solutions: primary, secondary, and tertiary amines
 - Physical and chemical properties of common amines (MEA, DEA, MDEA, etc.)
 - Selecting the right amine for specific applications

Day 2: Amine Gas Treating System Design

- **Amine Unit Design Basics**
 - Key components: absorber, regenerator, pump, heat exchanger, and flash drums
 - Amine circulation and flow patterns
 - Sizing of equipment (absorbers, regenerators, etc.)
- **Amine System Design Considerations**
 - Design parameters: flow rates, temperatures, pressure, and concentrations
 - Integration with other gas processing equipment (e.g., sweetening, dehydration)
- **Process Flow Diagrams (PFDs) and Piping & Instrumentation Diagrams (P&IDs)**
 - Understanding PFDs and P&IDs in the context of amine treating systems
 - Key instrumentation and controls in an amine gas treating unit
 - Example case studies of amine unit designs

Day 3: Amine Gas Treating System Operation

- **Operating Principles of Amine Units**
 - The absorption process: how amines capture acid gases
 - The regeneration process: stripping acid gases from the amine solution
 - Heat integration and optimization
- **Operational Considerations**
 - Temperature and pressure control in the absorber and regenerator
 - Controlling amine strength and flow rates
 - Managing loading and unloading of acid gases
- **Safety and Environmental Considerations**
 - Handling amine solutions safely
 - Managing H₂S and CO₂ emissions
 - Environmental compliance: regulations, air quality, and waste treatment

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Day 4: Optimization, Troubleshooting, and Maintenance

- **Optimization of Amine Gas Treating Systems**
 - Strategies to optimize system performance (e.g., minimizing energy consumption, maximizing acid gas removal)
 - Operational best practices for efficiency and longevity
 - Reducing operating costs and improving throughput
- **Common Operational Issues**
 - Amine degradation and methods for prevention
 - Foaming in the absorber and how to prevent it
 - Corrosion problems and solutions
- **Troubleshooting Techniques**
 - Diagnosing and solving common problems (e.g., low amine capacity, high acid gas content)
 - Practical troubleshooting case studies
 - Tools for monitoring system health (e.g., online analysis, testing kits)
- **Preventive Maintenance**
 - Routine maintenance practices
 - Managing the amine solution: testing, regeneration, and fresh makeup
 - Equipment inspection and cleaning procedures

Day 5: Advanced Topics, Case Studies, and Review

- **Advanced Topics in Amine Gas Treating**
 - Advanced amine solutions (e.g., newer amines for specific applications, hybrid systems)
 - Modifications to improve performance in high-pressure or high-temperature conditions
 - The role of membrane separation and other alternative technologies
- **Real-World Case Studies**
 - Case studies of amine gas treating system issues and solutions
 - Discussion of industry examples and lessons learned from field experience
- **Review and Final Assessment**
 - Recap of key concepts covered in the course
 - Group discussion, Q&A

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NOTE:

Pre-& Post Tests will be conducted.

Case Studies, Group Exercises, Group Discussions, Last Day reviews, and assessments will be carried out.

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