Tank Farm Engineering

Design, Construction, Maintenance & Inspection of Storage Tanks

Focus on: The Manager ☐ The Specialist ☑ Spotlight Programme ☐ Hands-on Skills ☑

Course Overview

This comprehensive training course provides the essential knowledge and practical skills required for storage tank design, construction, and maintenance. Covering key industry standards such as API 650 and API 653 (and comparison with API 620 and API 2610), participants will gain a deep understanding of tank selection, design, capacity calculations, structural components, safety measures, and regulatory compliance.

The course also addresses fire protection, risk management, spill control, and inspection techniques to ensure safe and efficient operations. Through expert instruction and real-world case studies, attendees will develop the expertise needed to design, operate, maintain and inspect storage tanks across various industries.

Key topics include:

- Design Standards & Regulations – API 650 and API 653 compliance.
- Tank Types, Components & Selection – Understand various techniques for storage tank design.
- Construction & Engineering Considerations – Foundations, piping systems, mixers, and spacing.
- Types & Terminology: Grasp different tank types (e.g., fixed roof, floating roof) and industry terms.
- Operational Best Practices & Efficiency – Tank filling, drainage, water separation, and emissions control.
- Safety, Fire Protection & Risk Management – Handling flammable liquids, firefighting, and spill control.
- Performance & Safety: Assess tank performance, safety risks, and corrosion mechanisms, Preventive maintenance, corrosion control, and repairs.

Course Objectives		This Course is Ideal For:	
1	Compare storage tank types (bolted, welded, fixed/floating roof) according to API 650	✓	Chemical, Mechanical or Process Engineers
2	Learn industry standards (API 650, 620, 2610) governing tank construction, operation, and maintenance.	✓	Engineers involved in selecting and or design tanks
3	Assess material compatibility and environmental factors to mitigate emissions, corrosion and degradation risks.	✓	Practicing Engineers and plant Operators
4	Implement safety and risk management protocols for flammable liquids, including fire protection, spill response, and hazard mitigation.	✓	Refinery Personnel

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5	Develop emergency preparedness plans for spills, fires, and operational hazards, including PPE and safe work practices.	✓	Professionals involved in handling, loading, or discharging of oil and gas cargoes.
6	Execute inspection and maintenance programs using API 653 guidelines to monitor corrosion, leaks, and long-term tank integrity.	✓	Government regulators.

Course Content

Day	Theme	Coverage

1	Introduction to Storage Tanks & Industry Standards	• Introduction and Uses of Storage Tanks
		• Types of Tanks: Bolted, Welded, etc.
		• Basic Properties and Characteristics of Petroleum and Products in Storage
		• Tank Selection Criteria & Design Considerations
		  ○ API Standard 650: Design and Construction of New Storage Tanks
		  ○ API Standard 620: Design and Construction of Large, Welded, Low-Pressure Storage Tanks
		  ○ API Standard 2610: Design, Construction, Operation, and Maintenance of Tank Facilities

2	Storage Tank Components & API 650 - Design Methods	• Tank Roofs: Fixed, Floating, and Roof Supports
		• Tank Rim and Seals, Vents & Vacuum Breakers
		• Tank Drainage and Water Separation and treatment Systems
		• Cylindrical Tank Design Considerations
		• Double Wall Storage Tanks v's Secondary Containment Systems
		• Tank design
		  ○ One Foot Method
		  ○ Variable-Design-Point (VDP) Method

3	Tank Construction, Layout & Engineering Considerations	• Foundations Construction Basics and Structural Integrity • Tank Layout and Spacing Requirements • Tank Capacity & Volume Calculations • Tank Piping Systems, Mixers, and BS&W (Bottom Sediment & Water) Control • Tank Calibration Techniques • Tank Gauging and Tank outages
4	Safety, Risk, and Emergency Response	• API Guidelines for Safe Storage Tank Operations ○ Storage of Flammable Liquids – Safety & Risk Considerations • Fire Fighting & Fire Protection for Storage Tanks • Handling Oil Spills and Emergency Response Procedures • Hazard Identification and Risk Mitigation Strategies • Personal Protective Equipment (PPE) and Safe Work Practices

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		• Regulatory Compliance and Environmental Considerations
5	API 653 - Inspection, Maintenance & Compliance	• API 653 - Inspection and Maintenance of Storage Tanks • Corrosion Prevention and Tank Integrity Management • Tank Cleaning, Repair, and Decommissioning Procedures • API Standards for Tank Operation & Maintenance • Leak Detection Systems and Monitoring Technologies • Long-Term Asset Management and Compliance Best Practices

Course Assessment	Certification
Participants will be assessed on:	Upon successful completion of the course, participants will receive a **Certificate of Successful Completion**, along with a **Transcript of Marks** showing the performance by grade in each element of assessment and overall.
Participation in sessions	
Completion of exercises & case studies	
Performance in assessments	

Course Instructor

With BSc and PhD degrees from the UK, and with over 30 years of refinery technology, operations, and management expertise for several famous-name oil companies, this speaker is now an internationally-famous chemical engineering consultant.
As a Chartered Chemist, a Member of the Royal Society of Chemistry and a Member of the American Institute of Chemical Engineers, he holds honorary appointments at a number of European universities and conducts cutting-edge research into vacuum distillation, gas recovery, absorption and pyrolysis.