

Water Treatment for Boilers and Chilled Water Systems

OVERVIEW

This course provides a practical, independent understanding of industrial water treatment for steam boiler and chilled water systems, going beyond the information typically provided by water treatment chemical suppliers.

Starting with the fundamentals of why water treatment is essential, the course explains how poor water quality leads to scaling, corrosion, fouling, microbiological growth, efficiency losses, and premature equipment failure. Delegates will gain a clear understanding of the core principles of water chemistry and how these principles apply differently to boiler systems and chilled water (closed-loop) systems.

The course focuses on best-practice water treatment strategies, system operation, monitoring, and control methods that maximise equipment life, improve energy efficiency, and reduce overall treatment costs. Participants will learn how to interpret water analysis results, critically assess existing treatment programmes, and make informed decisions rather than relying solely on supplier recommendations.

A recommended option includes a field process workshop, where the instructor reviews the delegate's actual water treatment systems, procedures, and operating conditions. This interactive session allows participants to receive expert feedback on their treatment methods, chemical selection, monitoring practices, and opportunities for improvement.

TRAINING OBJECTIVES

By the end of this course, delegates will be able to:

- Understand why water treatment is critical to the reliability, efficiency, and lifecycle of boiler and chilled water systems
- Explain the fundamental chemistry and physics behind water treatment—beyond vendor product descriptions
- Identify common failure mechanisms such as scaling, corrosion, fouling, microbiological growth, and carryover
- Evaluate and optimise boiler water and chilled water treatment programmes for their specific operating conditions
- Interpret water analysis results and relate them to system performance and risk
- Apply best-practice operating, monitoring, and control strategies to reduce downtime and extend equipment life
- Assess the cost drivers in water treatment programmes and implement strategies to control chemical, water, and energy costs
- Critically review their current water treatment approach, supplier recommendations, and site practices
- Implement practical inspection, testing, and maintenance procedures aligned with industry standards
- Develop an action plan to improve system efficiency, reliability, and compliance

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FUNDAMENTALS OF WATER CHEMISTRY

- Water as a solvent and heat transfer medium
- Key water quality parameters (pH, alkalinity, hardness, TDS, conductivity)
- Dissolved gases and their effects
- Understanding water analysis reports

BOILER SYSTEMS – WATER QUALITY REQUIREMENTS

- Boiler system overview (feedwater, boiler water, condensate)
- Scale formation and its impact on heat transfer
- Corrosion mechanisms in boilers and condensate systems
- Carryover, foaming, and priming
- Boiler blowdown principles and control

BOILER WATER TREATMENT METHODS

- External water treatment (softening, demineralisation, RO)
- Internal chemical treatment
- Oxygen scavengers and corrosion inhibitors
- Scale control and sludge conditioning
- Condensate treatment and protection

CHILLED WATER SYSTEMS – WATER QUALITY REQUIREMENTS

- Chilled water and closed-loop HVAC systems
- Corrosion risks in closed systems
- Fouling and microbiological growth
- Material compatibility (steel, copper, aluminium)
- Importance of system cleanliness

CHILLED WATER SYSTEM TREATMENT AND CONTROL

- Corrosion inhibitors for chilled water systems
- Biocides and microbiological control
- Side-stream filtration and dirt separation
- Commissioning and flushing procedures
- Leak detection and makeup water control

MONITORING, TESTING & CONTROL

- Routine water testing methods
- Online monitoring vs manual testing
- Key control limits and corrective actions
- Chemical dosing systems
- Record keeping and trend analysis

OPERATIONAL BEST PRACTICES

- Start-up and shutdown procedures
- Troubleshooting common water treatment issues
- Working with water treatment service providers
- Health, safety, and environmental considerations
- Compliance with standards and guidelines

ENERGY EFFICIENCY AND COST OPTIMISATION

- Impact of scale and fouling on energy consumption
- Optimising blowdown and chemical usage
- Life-cycle cost benefits of proper water treatment
- Preventing unplanned downtime and failures

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Live Online Training | 26 – 27 March 2026



Booking Contact (Approving Official) Mr/Mrs/Ms

Full Names: _____

Company name: _____

Direct Tel No: _____ E-mail: _____ Fax: _____

VAT No: _____

Address: _____

Signature _____

Person Responsible for Finance: _____ Direct Tel No: _____ Date of Payment: _____

BANKING DETAILS:

Independent Training Management Pty Ltd

Bank: FNB South Africa

Account Number: 62685879276

Branch Code: 251650

Branch: Randburg

THE FOLLOWING HEREBY CONFIRM ATTENDANCE TO THE WORKSHOP

Delegate 1: Names _____

Position: _____ E-Mail: _____

Delegate 2: Names _____

Position: _____ E-Mail: _____

Delegate 3: Names _____

Position: _____ E-Mail: _____

Delegate 4: Names _____

Position: _____ E-Mail: _____

Delegate 5: Names _____

Position: _____ E-Mail: _____

All fees are current at the time of going to print; however, we reserve the right to change them.

2. Additional Delegate Rates:

Additional delegate rates apply when bookings are made at the same time on the same course.

3. Confirmation Instructions:

On receipt of this submitted booking form and payment or purchase order you will receive a confirmation letter by email confirming your participation in the training event.

This includes a location map with directions and venue details and starting times.

4. Attendance:

Please note that no learner will be permitted to attend any training course without proof of payment or an order no.

5. Delegate Substitution:

Substitutes can be made at any time without incurring a penalty. Please inform us in writing so we can make the necessary arrangements for the new learner.

6. Payment:

Payment can be made by cheque or by electronic transfer, and must be received 5 working days prior to the commencement of the course.

Please quote the reference number from your invoice and organisation name so that payments can be tracked. All cancellations must be done in writing and emailed directly to Independent Training. Management Inform us immediately if you have to re-schedule or cancel the booking so that we can inform the caterers and conference venue.

The following charges apply if you cancel:

- 11 - 30 days before a course = 10% of the course fee

- 6 – 10 days before a course = 20% of the course fee

- 4 – 6 days before a course = 30% of the course fee

- 1-3 days before a course = 50% of the course fee