



INSPECTION, INTEGRITY AND CORROSION TRAINING

Heat Exchanger Mechanical Design and Inspection

5 day course

Classroom, online or in-house

Course overview

A tube to tubesheet joint weeping a few drops lets cooling water into a hydrocarbon stream, and the cause is usually fixed at the design stage rather than in operation. This programme treats shell and tube exchangers as pressure hardware. Delegates decode TEMA designations and classes R, C and B, then compare fixed tubesheet, U tube and floating head construction and how each copes with differential expansion. Tubesheet thickness, expansion joints, baffles, tie rods and flow induced tube vibration are worked through alongside ASME Section VIII rules. Tube to tubesheet joints get detailed treatment: expanded, welded and both, with their qualification and leak testing. Inspection follows, including eddy current, IRIS and remote field testing of tubes, plugging criteria, bundle pulling and test sequence. Delegates leave able to review an exchanger datasheet and plan its inspection.

What you will learn

- Interpret TEMA front head, shell and rear head designations and mechanical classes
- Select between fixed tubesheet, U tube and floating head construction
- Calculate tubesheet thickness and assess the need for an expansion joint
- Evaluate baffle, tie rod and support layouts for flow induced vibration
- Specify expanded, welded or combined tube to tubesheet joints and their qualification
- Select eddy current, IRIS or remote field testing for a given tube material
- Apply tube plugging criteria and plan bundle extraction
- Plan shell side and tube side pressure test sequences

Who should attend

- Mechanical and static equipment engineers
- Exchanger design and fabrication engineers
- Inspection engineers responsible for exchanger bundles
- Maintenance planners for turnaround exchanger work
- Project engineers reviewing exchanger vendor packages

Course outline

- 01 TEMA designations and mechanical classes
- 02 Fixed tubesheet, U tube and floating head types
- 03 Tubesheet design and expansion joints
- 04 Baffles, supports and tube vibration
- 05 Tube to tubesheet joint design and qualification
- 06 Eddy current, IRIS and remote field tube testing
- 07 Tube plugging criteria and bundle handling
- 08 Shell side and tube side pressure test sequence
- 09 Reviewing an exchanger datasheet

Upcoming dates



Dates	Venue	Format	Fee per delegate
19 to 23 October 2026	Maputo, Mozambique	Classroom	USD 1,325
26 to 30 October 2026	Online	Online	R8,500
9 to 13 November 2026	Kigali, Rwanda	Classroom	USD 1,325
28 December 2026 to 1 January 2027	Windhoek, Namibia	Classroom	R19,950

Fees and how to register

This 5 day course is **R8,500** per delegate online, **R19,950** in the classroom in South Africa, Botswana, Namibia, Lesotho and Eswatini, and **USD 1,325** in the classroom elsewhere in Africa. In-house training is quotation on request. Book 2 or more delegates on this course and save 10%.

To register or request an in-house proposal, visit www.afrisciencegroup.com, email info@afriScience.co.za, or WhatsApp us on **+27 63 479 1136**.

AfriScience Group | +27 61 536 6531 | info@afriScience.co.za | Pretoria, Gauteng, South Africa