JUPITER PRIME

Consulting • Training • Advisory

جوبيتر برايم للاستشارات والتدريب

COURSE BROCHURE

Heat Exchanger Type Selection and Specification Training Course

30 May – 3 June 2027
Muscat

Heat Exchanger Type Selection and Specification Training Course

Ref: 1004_38029 **Date:** 30 May – 3 June 2027 **Location:** Muscat **Fees:** 6500 GBP

Heat Exchanger Type Selection and Specification is a 1-week training course for process, mechanical and maintenance engineers who must choose between shell-and-tube, plate, air-cooled and double-pipe units for a new or changed duty, and each participant completes an Exchanger Selection Dossier. Water scarcity, tighter plot space and pressure to cut cleaning outages now make the first choice of exchanger type harder to reverse. Jupiter Prime Training delivers this course on heat exchanger type selection.

Why Heat Exchanger Type Selection and Specification Matters Now

Three groups shape every exchanger choice. Project engineers face compact plots and scarce cooling water. Operations staff want units they can open, clean and return to service within a short outage window. Procurement teams want the whole-life cost of each option, not only the quote. A poorly matched type leads to repeated bundle pulls, gasket leaks or fan capacity shortfalls on hot days. The course rests on duty-driven selection logic, specification sheets and life-cycle costing LCC applied to each candidate.

Who Gains Most from Heat Exchanger Type Selection and Specification

- Engineers who prepare exchanger specification sheets and enquiry packages for modifications
- Engineers who compare vendor proposals and clarify technical deviations
- Maintenance engineers who judge how each design can be opened, cleaned and inspected
- Process engineers who set the duty, allowable pressure loss and operating envelope
- Reliability engineers who track exchanger failure modes across a site

Engineering and maintenance groups preparing a revamp gain most when several members attend.

Heat Exchanger Type Selection and Specification Capabilities

Participants set a duty against each exchanger family and record the choice in terms a vendor can quote.

- Compare shell-and-tube, gasketed plate, air-cooled and double-pipe designs for a stated duty — type selection
- Specify process conditions, materials and cleaning access on a datasheet — vendor enquiry packages
- Assess a vendor thermal rating for margin, fouling allowance and pressure loss — bid acceptance
- Weigh plot space, cooling medium and weight against duty — layout and project engineers
-

Build a life-cycle cost comparison of candidate types — finance and procurement approvers
- Design an inspection and cleaning approach that suits the chosen type — maintenance planners

Key Heat Exchanger Type Selection and Specification Terms

- Exchanger datasheet — the standard sheet listing duty, fluid properties, design conditions, materials and allowable pressure loss.
- Gasketed plate exchanger — a frame of pressed plates sealed by gaskets, compact and easy to open.
- Air-cooled exchanger — finned tube bundles cooled by fans, used where water is scarce.
- Double-pipe exchanger — one pipe inside another, suited to small duties, high pressures and fluids with solids.
- Temperature cross — a condition where the cold outlet exceeds the hot outlet, forcing counter-current types.
- Approach temperature — the smallest temperature difference between the two streams, driving required surface.

Heat Exchanger Type Selection and Specification Day by Day

Day 1: Exchanger Families and Duty Definition

- Exchanger Family Overview — Matching Construction to Pressure, Temperature and Fluids
- Duty Statement and Heat Balance — Fixing Flows, Temperatures and Allowable Losses
- Approach Temperature and Temperature Cross Checks — Ruling Types In or Out
- Fluid Allocation Rules — Which Stream Goes Tube Side or Plate Side
- Selection Criteria Matrix — Weighting Cost, Space, Cleanability and Risk

Day 2: Shell-and-Tube and Double-Pipe Options

- Fixed, U-Tube and Floating-Head Arrangements — Thermal Expansion and Bundle Access
- Baffle Types and Shell Configurations — Pressure Loss Against Transfer Rate
- Double-Pipe and Hairpin Units — Small Duties, High Pressure and Solids
- Tube Materials and Corrosion Allowance — Service Life in Seawater and Hydrocarbons
- Thermal Rating Review of a Vendor Proposal — Margin and Overdesign Judgement

Day 3: Plate and Air-Cooled Options

- Gasketed, Brazed and Welded Plate Units — Gasket Compatibility and Pressure Limits
- Plate Channel Velocity and Fouling Tendency — Choosing Plate Patterns
- Forced and Induced Draught Air Coolers — Fan Power and Hot-Day Capacity
- Fin Type, Bundle Rows and Louvres — Winter Control and Plot Footprint
- Hybrid and Wet-Assisted Cooling — Water Saving Against Complexity

Day 4: Fouling, Inspection and Cleaning by Type

- Fouling Mechanisms by Service — Scaling, Biofouling, Coking and Particulates
- Fouling Allowance and Excess Surface — Clean Versus Dirty Design Trade-Off
- Inspection Access by Exchanger Type — Eddy Current, Visual and Pressure Tests
- Chemical, Hydro-Jet and Plate Pack Cleaning — Outage Length and Effluent
- Life-Cycle Cost Model — Purchase, Energy, Cleaning and Replacement Over Service Life

Day 5: Practising the Exchanger Selection Dossier

- Duty Definition for a Chosen Plant Case — Datasheet Inputs and Limits
- Candidate Type Screening Using the Criteria Matrix — Shortlist of Two Designs
- Vendor Rating Comparison for the Shortlist — Margin, Weight and Footprint
- Maintenance Access and Cleaning Plan for the Preferred Type — Outage Impact
- Exchanger Selection Dossier — Recommendation for Engineering and Procurement Approval

Applying Heat Exchanger Type Selection and Specification After the Course

- Rework the datasheet of one pending exchanger enquiry to state fouling, materials and cleaning access.
- Run the criteria matrix and life-cycle cost model on one exchanger due for replacement.

Heat Exchanger Type Selection and Specification Questions FAQ

What is heat exchanger type selection and specification, and why does it matter now?

It is the choice of exchanger family for a duty and the datasheet that fixes it for vendors. It matters now because water, plot space and outage time are scarce.

Which roles gain most from heat exchanger type selection and specification?

Process, mechanical and maintenance engineers gain most. You benefit if you write datasheets, review vendor bids, or plan exchanger cleaning in refining, chemicals or power.

How does heat exchanger type selection and specification differ from an exchanger repair or detailed design course?

It comes earlier in the life of the unit. Repair courses treat bundles in service and design courses size geometry, while this subject decides which family to buy and what to specify.

What do you bring back from heat exchanger type selection and specification?

You bring back a worked selection case for a real duty. It includes the datasheet, criteria matrix, vendor comparison and cleaning plan.

Heat Exchanger Type Selection and Specification: The Way Forward

The Exchanger Selection Dossier first informs whether a duty should go to shell-and-tube, plate, air-cooled or double-pipe construction. Process and maintenance engineers use it with procurement to issue enquiries and judge bids. After its first use, revisit the fouling allowance and cleaning assumptions against the unit's actual run length.