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COURSE BROCHURE

Pump and Valve Material Selection by Service Duty Training Course

31 October – 4 November 2027
Manama

Pump and Valve Material Selection by Service Duty Training Course

Ref: 1816_66717 **Date:** 31 October – 4 November 2027 **Location:** Manama **Fees:** 5500 GBP

Pump and Valve Material Selection by Service Duty is a 1-week training course for mechanical maintenance engineers who choose wetted parts and seals, ending with a duty-to-material selection sheet for a real plant service. Corrosive, abrasive and hot fluids now punish any mismatch between fluid chemistry and metallurgy, so wrong choices show up quickly as leaks and short runs. The course is delivered by Jupiter Prime Training.

Why Pump and Valve Material Selection Matters Now

Three pressures shape this subject today: plants process harsher feeds; spare parts are bought on price by buyers who rarely see the fluid data sheet; and fewer senior fitters remember past failures. An organisation that matches casing, impeller, trim and elastomer to the duty gains longer runs and fewer emergency repairs, while one that copies old orders inherits erosion, pitting and seal fires. The course rests on the duty data sheet, corrosion allowance practice and Failure Mode and Effects Analysis FMEA.

Who Gains Most from Pump and Valve Material Selection

- Engineers responsible for specifying replacement pumps, impellers and casings
- Staff who approve valve body, trim and seat materials for isolation duties
- Technicians who repack glands and fit mechanical seals in the field
- Reliability staff who trace repeat failures back to the wrong alloy or elastomer
- Stores and materials staff who check that substitute parts suit the original duty

A plant maintenance section gains most when its mechanical engineer, a senior fitter and the materials buyer attend together.

Pump and Valve Material Selection Capabilities

Participants learn to read a fluid service and turn it into durable parts.

- Assess fluid chemistry, solids content and temperature against candidate alloys — the replacement casing and impeller order
- Specify valve body, trim, seat and packing for a stated isolation duty — the purchase requisition
- Weigh cast iron, duplex stainless, high-chrome iron and lined options — the cost against expected run length
- Apply seal face and elastomer compatibility checks — the mechanical seal or gland packing choice
- Test a failed part against the original duty to find the material cause — the repeat failure report
- Communicate a substitution decision with its risks — the stores team and the operations supervisor

Key Pump and Valve Material Selection Terms

- Service duty — the full description of fluid, solids, temperature, pressure and cycling that a pump or valve must withstand.
- Wetted parts — components touched by the process fluid, such as casing, impeller and valve trim.
- Erosion-corrosion — accelerated metal loss where flowing fluid strips the protective surface film.
- Galling — adhesive wear and seizure between sliding metal surfaces.
- Gland packing — compressed rings of braided material that seal a shaft or valve stem.
- Elastomer compatibility — the ability of an O-ring or seal rubber to resist swelling, hardening or cracking in a given fluid.

Pump and Valve Material Selection Day by Day

Day 1: Reading the Service Duty

- Fluid Duty Data Sheet — Which Conditions Drive Material Risk
- Solids Size and Concentration — Erosion Severity on Wetted Parts
- Temperature and Chloride Limits — Pitting and Stress Cracking Exposure
- Duty Point on the Pump Curve — Recirculation and Cavitation Wear
- Valve Isolation Classes — Tight Shut-Off Versus Throttling Service

Day 2: Pump Materials and Construction

- Cast Iron, Bronze and Carbon Steel Casings — Clean Water and Utility Service
- Austenitic and Duplex Stainless Grades — Brines, Acids and Seawater
- High-Chrome White Iron and Rubber Linings — Slurry and Abrasive Duty
- Impeller Type and Wear Ring Clearance — Efficiency Loss Over Run Length
- Pump Material Matrix — Matching Construction Class to Each Duty

Day 3: Valve Bodies, Trims and Seats

- Gate, Globe, Ball and Butterfly Designs — Fit for Isolation Duty
- Trim Hardfacing and Seat Inserts — Galling and Wire-Drawing Resistance
- Soft Versus Metal Seats — Temperature, Solids and Leak Tightness
- Stem Packing Sets and Live Loading — Fugitive Leakage Control
- Valve Selection Chart — Body and Trim Choice per Service

Day 4: Seals, Repacking and Failure Diagnosis

- Mechanical Seal Face Pairs — Abrasive and Hot Fluid Suitability
- Elastomer Swell and Hardening Checks — O-Ring Compound Choice
- Gland Repacking Procedure — Ring Cutting, Staggering and Adjustment
- Failed Part Inspection — Erosion, Pitting or Galling as Root Cause
- Material Substitution Risk Check — Approving Alternative Spare Parts

Day 5: Practising the Duty-to-Material Selection Sheet

- Chemical Plant Case — Duplex Pump for a Hot Chloride Stream
- Mining Case — Lined Slurry Pump and Knife Gate Valve Choice
- Repeat Failure Review — Applying Inspection Findings to a New Order
- Spares Rationalisation — Common Materials Across Similar Duties
- Duty-to-Material Selection Sheet — Final Peer Review and Sign-Off

Applying Pump and Valve Material Selection After the Course

- Build a duty data sheet for the three pumps with the shortest run lengths and check each wetted part against it.
- Audit stem packing and seat materials on one isolation valve group and raise corrected requisitions where a mismatch appears.

Pump and Valve Material Selection Questions FAQ

What is pump and valve material selection and why does it matter now?

Pump and valve material selection is the matching of wetted parts, trims and seals to the fluid duty. It matters now because harsher feeds and price-led buying cause leaks and short runs.

Which roles gain most from pump and valve material selection skills?

Mechanical maintenance engineers gain most, followed by senior fitters, reliability staff and materials buyers. Each decides, approves or fits parts whose metallurgy must suit the service.

How does pump and valve material selection differ from a pump troubleshooting course?

Pump and valve material selection starts from the fluid and asks which construction survives it. A troubleshooting course starts from symptoms such as vibration or low flow.

What do you bring back from pump and valve material selection training?

You bring back a completed duty-to-material selection sheet for one real service at your plant. It lists duty data, chosen materials and substitution limits.

Pump and Valve Material Selection: The Way Forward

The duty-to-material selection sheet first informs the next replacement order for a pump or valve with a poor run history. Maintenance engineers, fitters and buyers use it to check every quote and substitute part. After its first use, revisit the sheet with the inspection findings from that part and the operating hours it achieved.