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COURSE BROCHURE

# Tribology, Wear and Machinery Lubrication Training Course

30 May – 3 June 2027
Dubai

# Tribology, Wear and Machinery Lubrication Training Course

**Ref:** 1425_53130 **Date:** 30 May – 3 June 2027 **Location:** Dubai **Fees:** 4900 GBP

Tribology, Wear and Machinery Lubrication is a 1-week training course for reliability engineers, lubrication technicians and maintenance planners, built around a lubrication route and wear diagnosis map that assigns the right lubricant, interval and oil test to every bearing and gearbox on a site. Most rolling bearing and gear failures still trace back to the wrong oil, too little of it or dirt in it. Jupiter Prime Training delivers this tribology, wear and machinery lubrication course.

## Why Tribology, Wear and Machinery Lubrication Matters Now

Three forces shape lubrication practice today. Machines run faster and hotter in smaller housings, which thins oil films and narrows the margin for error. Lubricant formulations multiply, with synthetic base oils and specialist additives that do not always mix. Experienced oilers are retiring and lubrication is often handed to contractors without clear routes. Sites that control friction, contamination and oil condition extend bearing and gear life and cut energy use; those that do not see repeat failures and seized machines. The course draws on ISO 55001 for asset management and EN 13306 for maintenance terminology.

## Who Gains Most from Tribology, Wear and Machinery Lubrication

- Reliability engineers who investigate bearing and gear failures
- Lubrication technicians who fill, sample and top up machines on routes
- Maintenance planners who schedule oil changes and condition checks
- Stores staff who receive, store and dispense lubricants
- Condition monitoring specialists who read oil and wear debris reports

A cement, mining or process site gains most when its reliability, lubrication and stores staff attend together and agree one lubricant register.

## Tribology, Wear and Machinery Lubrication Capabilities

Participants move from topping up by habit to specifying lubricant, quantity and test for each machine on evidence from the contact itself.

- Assess film thickness and lubrication regime for a bearing or gear contact — lubricant viscosity choice
- Specify lubricant type, additive package and relubrication interval — route sheets and stores
- Interpret oil analysis for viscosity, oxidation, water and wear metals — change or keep decisions
- Design contamination control with breathers, filters and sealed transfer — component life
- Apply wear mode identification to failed bearings and gears — root cause findings
- Build a lubrication route with tasks, quantities and sample points — planners and technicians

## Key Tribology, Wear and Machinery Lubrication Terms

- Tribology — the study of friction, wear and lubrication between surfaces in relative motion.
- Elastohydrodynamic lubrication — the regime in rolling contacts where high pressure briefly stiffens oil, keeping surfaces apart.
- Boundary lubrication — a regime where surfaces touch and protection depends on additive films rather than oil thickness.
- Viscosity index — a number showing how much an oil's viscosity changes with temperature.
- Particle cleanliness code — a coded count of particles by size in an oil sample, used to set cleanliness targets.
- Ferrography — a method that separates wear particles magnetically so their shape and size reveal the wear mechanism.

## Tribology, Wear and Machinery Lubrication Day by Day

### Day 1: Friction and Surface Contact

- Surface Roughness and Real Contact Area — Friction Behaviour in Machines
- Stribeck Curve and Lubrication Regimes — Speed, Load and Viscosity Trade-Offs
- Hydrodynamic and Elastohydrodynamic Films — Bearing and Gear Film Thickness
- Boundary Lubrication and Additive Films — Start-Up and Low-Speed Protection
- Energy Losses from Friction — Efficiency Gains Through Lubricant Choice

### Day 2: Wear Mechanisms and Failure Modes

- Adhesive and Abrasive Wear — Scuffing and Scoring Diagnosis
- Surface Fatigue and Micropitting — Rolling Contact Life Limits
- Corrosive Wear and Fretting — Moisture and Vibration Damage
- Bearing Damage Classification — Root Cause Evidence from Raceways
- Gear Tooth Failure Patterns — Load, Alignment and Lubricant Causes

### Day 3: Lubricant Selection and Application

- Base Oils and Additive Packages — Mineral Versus Synthetic Choices
- Viscosity Grade Selection Method — Matching Speed, Load and Temperature
- Greases, Thickeners and Compatibility — Mixing Risks and Changeover
- Relubrication Intervals and Quantities — Over and Under Greasing
- Centralised and Automatic Lubricators — Reliability Versus Manual Routes

### Day 4: Oil Analysis and Contamination Control

- Representative Oil Sampling Points — Data Quality for Decisions
- Oil Condition Tests for Viscosity, Oxidation and Water — Oil Change Timing
- Wear Metal Spectroscopy and Ferrography — Early Failure Warnings
- Particle Cleanliness Targets — Filter and Breather Specification
- Lubricant Storage and Handling — Contamination from Stores to Machine

## Day 5: Practising the Lubrication Route and Wear Diagnosis Map

- Regime and Viscosity Check for Sample Machines — Applied Film Thickness
- Oil Report Interpretation Exercise — Applied Condition Limits
- Failed Component Examination — Applied Wear Mode Identification
- Criticality Ranking Under ISO 55001 Principles — Lubrication Task Priorities
- Lubrication Route and Wear Diagnosis Map — Lubricants, Intervals and Tests

## Applying Tribology, Wear and Machinery Lubrication After the Course

- Audit one production line for correct viscosity grade, grease quantity and breather condition and record each mismatch.
- Set particle cleanliness targets for critical gearboxes and hydraulic units and start a sampling routine from fixed points.

## Tribology, Wear and Machinery Lubrication Questions FAQ

### What is tribology, wear and machinery lubrication and why does it matter now?

It is the science and practice of controlling friction and wear between moving parts with the right lubricant. Faster, hotter machines and complex oils make disciplined lubrication central to bearing and gear life.

### Which roles gain most from tribology, wear and machinery lubrication?

Reliability engineers, lubrication technicians and maintenance planners gain most, together with stores staff and condition monitoring specialists who handle oils and reports.

### How does tribology, wear and machinery lubrication differ from a vibration analysis course?

It deals with the oil film and contact surfaces themselves. Vibration analysis detects faults through machine motion, while this course prevents and diagnoses wear through lubricant choice, cleanliness and oil testing.

### What do you bring back from tribology, wear and machinery lubrication?

You bring back a route that lists the lubricant, quantity, interval and oil test for each critical machine, plus a guide to reading wear evidence.

## Tribology, Wear and Machinery Lubrication: The Way Forward

The lubrication route and wear diagnosis map first informs which machines need a lubricant change or tighter contamination control. Technicians follow it on rounds, planners schedule from it and reliability engineers use it in failure investigations. After the first oil analysis cycle, revisit the cleanliness targets and intervals, since real sample results often show where routes were too cautious or too lax.