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Course Name

Mechanical Seals, Bearings & Lubrication Engineering

Sector Name

Mechanical Engineering

Document Type

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Mechanical Seals, Bearings & Lubrication Engineering

Course Introduction

Bearings, mechanical seals, and lubrication systems are closely connected to the performance of rotating machinery, yet problems affecting these components are often treated independently. Excessive temperature, leakage, premature bearing damage, lubricant deterioration, or repeated seal problems may originate from incorrect selection, contamination, loading, alignment, operating conditions, or interactions between several mechanical elements. Replacing the damaged component without understanding these relationships can result in the same problem returning.

Boost Consulting & Training offers this course to develop an integrated engineering understanding of bearings, mechanical seals, and lubrication within rotating equipment. Participants examine component selection and operating behavior, bearing loads and clearances, seal arrangements, lubricant properties, contamination control, lubrication methods, and common damage patterns. Practical investigations focus on connecting physical evidence and operating conditions with the mechanisms responsible for component deterioration.



The **main concept of this course** is to understand bearings, seals, and lubrication as an interacting mechanical system and use engineering evidence to prevent repeated component problems.

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Mechanical Seals, Bearings & Lubrication Engineering

Target Audience

- ✓ Mechanical and rotating equipment engineers
- ✓ Plant and equipment engineers
- ✓ Mechanical supervisors and technical specialists
- ✓ Engineers responsible for machinery performance and component selection

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Learning Objectives

- ✓ Explain the functions and operating characteristics of common bearing and mechanical seal designs.
- ✓ Evaluate bearing selection, loading, fit, clearance, and operating conditions.
- ✓ Assess mechanical seal arrangements and the factors affecting sealing performance.
- ✓ Select appropriate lubrication methods and lubricant characteristics for equipment applications.
- ✓ Identify contamination and lubrication conditions that accelerate component deterioration.
- ✓ Recognize common bearing and seal damage patterns and their probable causes.
- ✓ Distinguish component damage from problems originating elsewhere in the equipment.
- ✓ Apply engineering analysis to improve bearing, seal, and lubrication performance.

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Mechanical Seals, Bearings & Lubrication Engineering

Course Outline

✓ Day 01

Understanding Bearing Behavior

Selecting and Applying Bearings

- ✓ Compare rolling-element and journal bearings and their operating applications.
- ✓ Evaluate radial, axial, combined, static, and dynamic loading conditions.
- ✓ Match bearing characteristics with speed, load, temperature, and equipment requirements.

Controlling Fit, Clearance, and Installation

- ✓ Understanding the effects of shaft and housing fits on bearing performance.
- ✓ Evaluate internal clearance and its change during installation and operation.
- ✓ Complete a **Bearing Application Challenge** involving competing operating requirements.

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Course Outline

✓ Day 02

Diagnosing Bearing Problems

Reading Bearing Damage

- ✓ Recognize wear, fatigue, overheating, scoring, corrosion, and surface damage patterns.
- ✓ Connect physical evidence with loading, lubrication, contamination, and installation conditions.
- ✓ Distinguish primary damage mechanisms from secondary damage created after deterioration begins.

Tracing the Source of Bearing Problems

- ✓ Investigate misalignment, imbalance, excessive loading, electrical effects, and structural influences.
- ✓ Evaluate operating history alongside physical component evidence.
- ✓ Conduct a **Bearing Failure Investigation** to determine the most credible damage mechanism.

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Course Outline

✓ Day 03

Engineering Effective Lubrication

Matching Lubrication to Equipment Needs

- ✓ Understand viscosity, lubricant film formation, temperature behavior, and operating requirements.
- ✓ Compare oil and grease lubrication across different equipment applications.
- ✓ Select appropriate lubrication approaches according to speed, load, environment, and component design.

Controlling Lubrication Quality

- ✓ Identify under-lubrication, over-lubrication, contamination, mixing, and lubricant degradation.
- ✓ Examine the effects of particles, moisture, temperature, and poor handling practices.
- ✓ Complete a **Lubrication Condition Assessment** using equipment and lubricant evidence.

Mechanical Seals, Bearings & Lubrication Engineering

Course Outline

✓ Day 04

Understanding Mechanical Seal Performance

Selecting Seal Arrangements

- ✓ Understand major mechanical seal components and sealing principles.
- ✓ Compare common seal configurations according to pressure, temperature, fluid, and equipment conditions.
- ✓ Evaluate how operating environment influences seal selection and performance.

Diagnosing Seal Leakage and Damage

- ✓ Investigate leakage, face damage, overheating, vibration-related effects, and loss of sealing stability.
- ✓ Connect seal problems with alignment, shaft movement, lubrication, pressure, and operating conditions.
- ✓ Run a **Mechanical Seal Diagnosis Case** using physical and operational evidence.

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Course Outline

✓ Day 05

Solving Interacting Component Problems

Connecting Bearings, Seals, and Lubrication

- ✓ Analyze how bearing condition and shaft behavior can influence seal performance.
- ✓ Examine how lubrication problems can create multiple symptoms across rotating equipment.
- ✓ Trace interactions between loading, temperature, contamination, movement, and component condition.

Preventing Repeated Component Damage

- ✓ Determine whether corrective action should address component selection, installation, lubrication, operating conditions, or equipment behavior.
- ✓ Verify that proposed actions address the identified damage mechanism rather than only its visible symptoms.
- ✓ Complete an **Integrated Mechanical Investigation** involving bearing damage, seal leakage, and lubrication evidence within the same equipment system.

Mechanical Seals, Bearings & Lubrication Engineering

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Dec. 7, 2026	Dec. 11, 2026	5 days	4250.00 \$	UAE , Dubai

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