MERCURY

Vibration Analysis ISO Category 1 (VCAT 1) Course

21 – 25 December 2026
Madrid (Spain)



Dubai - UAE: +971 4 450 5697
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Ref: 121416_1031676 **Date:** 21 – 25 December 2026 **Location:** Madrid (Spain) **Fees:** 6200 Euro

Introduction

The Vibration Analysis ISO Category 1 VCAT 1 Course equips participants with essential knowledge to detect, analyze, and interpret machine vibrations for preventive maintenance. It focuses on practical methods to identify early signs of equipment failure, ensuring reliability and operational safety. Participants learn standard ISO techniques for vibration measurement and diagnostics. The course emphasizes both theory and application in industrial settings. Learners will gain confidence in monitoring rotating machinery and reducing downtime. By the end, participants will understand key vibration patterns and corrective actions.

Targeted Groups

This Vibration Analysis ISO Category 1 VCAT 1 Course training targets professionals seeking knowledge and skills:

- Maintenance engineers in manufacturing and processing industries.
- Reliability engineers focused on equipment uptime.
- Mechanical technicians handling rotating machinery.
- Condition monitoring specialists.
- Plant supervisors are responsible for machine performance.
- Industrial consultants supporting maintenance strategies.

Course Objectives

Participants will achieve the following objectives by completing the Vibration Analysis ISO Category 1 VCAT 1 Course:

- Understand vibration fundamentals and ISO standards.
- Measure and record vibration signals accurately.
- Identify common mechanical faults using vibration analysis.
- Apply diagnostic techniques for pumps, motors, and compressors.
- Interpret vibration spectra and trends effectively.
- Enhance predictive maintenance strategies.
- Reduce unplanned equipment downtime.
- Improve plant safety and operational efficiency.

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Targeted Competencies

Participants will gain the following competencies during the Vibration Analysis ISO Category 1 VCAT 1 program:

- Proficiency in vibration measurement tools.
- Ability to analyze bearing, gear, and shaft vibrations.
- Knowledge of ISO-compliant vibration standards.
- Skills to diagnose misalignment, imbalance, and looseness.
- Capability to develop maintenance reports.
- Competence in trend monitoring and reporting.
- Practical understanding of vibration severity and limits.

Studying Scenarios

In this Vibration Analysis ISO Category 1 VCAT 1 training, participants develop skills through the following scenarios:

- Simulated vibration measurement of motors and pumps.
- Detecting misalignment in rotating equipment.
- Analyzing bearing defects using spectrum readings.
- Troubleshooting imbalance and looseness issues.
- Developing maintenance recommendations based on vibration trends.

Course Content

Unit 1: Fundamentals of Vibration

- Definition and importance of vibration in machinery.
- Types of mechanical vibrations.
- Basic vibration measurement concepts.
- Introduction to ISO vibration standards.
- Overview of vibration monitoring technologies.
- Units and scales used in vibration analysis.
- Common vibration instruments and sensors.

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Unit 2: Vibration Measurement Techniques

- Selecting appropriate measurement points.
- Correct installation of sensors.
- Using accelerometers, velocity, and displacement sensors.
- Data collection procedures and frequency ranges.
- Signal processing basics for vibration analysis.
- Ensuring data accuracy and reliability.
- Safety considerations during measurements.

Unit 3: Fault Diagnosis and Analysis

- Identifying imbalance and misalignment.
- Detecting bearing faults and wear.
- Gear mesh fault detection methods.
- Shaft defect analysis techniques.
- Interpretation of time and frequency domain data.
- Recognizing resonance and harmonics.
- Case studies of common industrial faults.

Unit 4: Predictive Maintenance Strategies

- Role of vibration analysis in preventive maintenance.
- Trend monitoring and severity assessment.
- Setting alarm limits and thresholds.
- Scheduling inspections based on vibration trends.
- Integrating vibration data with maintenance software.
- Evaluating machine health for reliability improvement.
- Cost-effective strategies for downtime reduction.

Unit 5: Practical Applications and Reporting

- Hands-on measurement exercises.
- Analyzing real-world machine vibration data.
- Preparing diagnostic reports.
- Recommending corrective actions.
- Interpreting ISO vibration severity charts.
- Communicating findings to management.
- Continuous improvement using vibration insights.

Final Insights & Key Takeaways

Participants leave with practical skills to efficiently monitor and interpret machinery vibrations. They gain confidence in applying ISO standards for predictive maintenance and reliability enhancement.