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# PRACTICAL LUBRICATION ENGINEERING FOR ENGINEERS AND TECHNICIANS



## **YOU WILL LEARN:**

- How to choose the best lubricant for your application
- How to better understand and manage lubricants
- How to use lubricants effectively in a proactive maintenance program
- When to select grease or oil as the lubricant of choice
- Best practices for oil draining, flushing and charging
- How to write equipment lubrication procedures
- How to handle lubricants in pumps and reservoirs
- The truth about aftermarket additives and oil conditioners
- How to best store lubricants and handle them effectively
- The latest techniques which are dramatically different to those of 10 years ago
- How to extend the life of your lubricants
- Troubleshooting techniques to deal with lubricants effectively in the future

## **WHO SHOULD ATTEND:**

- Supervisors & Foremen
- Consulting Engineers
- Process Technicians
- Plant Engineer-Managers & Supervisors
- Plant Operations & Maintenance Personnel
- Predictive Maintenance Professionals
- Artisans & tradespeople
- Facilities Engineers & Managers
- Mechanical Engineers
- Design Engineers
- Lubrication technicians

## The Workshop

The Lubrication Fundamentals workshop is a comprehensive, highly practical and interactive two-day course. With a bewildering selection of thousands of lubricant types, base stocks, additive packages and viscosity grades to choose, how do you know which one is right for your machine.

After attending this course and interacting with your fellow students and instructor, you will have the tools and knowledge to understand the key properties of lubricants and how to select the right one for your applications.

Modern lubrication programs have dramatically changed from the old methods that have been passed down through the generations. If you aren't using the right lubricant at the right time, in the right place, in the right quantity you could in fact be doing more harm than good and losing the opportunity to save your firm thousands of dollars with an effective lubrication program. This workshop collects together the strategic knowledge of many practising professionals in this area and gives you the best practice to work with.

You will have an opportunity to discuss Lubricant management, design-applications, operations, maintenance and management issues and be provided with the most up-to-date information and best practice in dealing with the subject. Towards the end of the workshop, you will have developed the skills and ability to recognise and solve lubricant problems in a structured and confident manner.

### Pre-requisites

A basic knowledge of mechanical engineering principles as applied to lubricants would be useful. However, this is not essential as it will be revised at the beginning of the workshop.

## The Program

### INTRODUCTION & BACKGROUND

Discuss briefly the composition of lubricants, crude oil derived lubricants and synthetic lubricants.

### TRIBOLOGY

- The cause of friction, heat, the result of friction, what causes wear
- The types of lubrication:
  - fluid and hydro-dynamic lubrication
  - boundary lubrication
- The characteristics of the lubricant under different operating conditions e.g. material surfaces, temperature conditions, load and viscosity of the lubricant
- Different types of lubricants for different applications

### THE PROPERTIES OF LUBRICANTS

- Viscosity
- Flashpoint and Volatility
- Oxidation and thermal stability
- Demulsibility
- Foaming and gas solubility
- Corrosion prevention
- Compatibility

### LUBRICATING OIL ADDITIVES

- Oxidation inhibitors
- Rust and corrosion inhibitor
- Pour point depressants
- Viscosity inhibitor (VI) improvers
- Anti-wear additives
- Extreme pressure (EP) additives
- Anti-foam additives
- Detergents and dispersants additives
- Demulsifiers and Emulsifiers
- Tackiness additives

### TYPES OF LUBRICANTS

#### GREASES AND GREASE LUBRICATION

- Grease characteristics
- Lubrication grease classification
- Choice of grease
- Grease types and performance
- Grease application and trouble-shooting
- Roller bearing lubrication

#### INTERNAL COMBUSTION LUBRICANTS

- Petrol and diesel engines
- The choice of lubricant by engine type
- Lubricant classification
- Plain bearing lubrication

### AUTOMOTIVE DRIVE LINE LUBRICATION

- Viscosity classifications
- Automatic transmission fluid

### HYDRAULIC SYSTEMS AND FLUIDS

- Hydraulic systems
- Viscosity of the lubricant
- Chemical stability
- Fire resistance
- Anti-wear
- Anti-rust
- Anti-foam

### MISCELLANEOUS LUBRICATION

- Steam Turbine Pumps and Motor Lubrication
- Air Compressor Lubrication

### LUBRICATION SYSTEMS

#### FILTRATION

- Contamination fundamentals
- Contamination generation
- Cleanliness control
- Filter fundamentals
- Filter performance and testing
- Flashing

#### CONDITIONS ASSESSMENT OF ROTATING MACHINERY

- Monitoring techniques
- Vibration analysis
- Oil analysis

#### TRIBOLOGY ROOT CAUSES OF FAILURES

- Fluid contamination control
- Leakage stability
- Fluid chemical stability
- Temperature stability
- Wear stability

#### STORAGE

- Safety Issues
- Shelf Life
- Contamination Potential

### CLOSING AND SUMMARY