LUBRICATION SCHOOL™

Improve machine reliability through best practice lubrication and oil analysis.
Lubrication School is designed to reduce machine failures and replacement costs, stop costly bearing failures, improve meantime between failures, help you squeeze maximum life from lubricants and extend machine life by up to 10x.

**WHAT IS LUBRICATION SCHOOL?**

Level 1 (Fundamentals):
Provides foundational training in industrial lubricants, machinery lubrication and oil sampling. It lays a strong foundation for establishing a best practice lubrication program.

Level 2 (Advanced):
Covers advanced machinery lubrication topics including lubricant selection, troubleshooting lubrication problems, metrics, PMs and more.
GET CERTIFIED

Your registration fee includes the option to get certified through the International Council for Machinery Lubrication (ICML).

Why Certify?
Certification is an important part of the training process because it confirms you possess the skills to do the job. Combining training with certification creates a knowledgeable and valuable employee.

Which Certifications?
Lubrication School Level 1 (Fundamentals of Machinery Lubrication) is designed to help you prepare for the following ICML certification exams:

- Level I Machine Lubricant Analyst (MLA I)
- Level I Machine Lubrication Technician (MLT I)

Lubrication School Level 2 (Advanced Machinery Lubrication) is designed to help you prepare for the following ICML certification exam:

- Level II Machine Lubrication Technician (MLT II)
GET THESE QUESTIONS ANSWERED

- How do I choose the correct viscosity for each of my applications?
- What is the difference between single-grade and multi-grade engine oils and which is best?
- How do I make management understand the importance of proper lubrication?
- How do I design a safe and efficient oil storage area?
- When is a flush required prior to refilling a system?
- Should I use oil reclamation to reduce our consumption of lubricants?
- Should I choose an oil with a lower viscosity in the winter?
- How can I extend drain intervals without risking machine health?
- Should I just go with my OEM’s lubricant recommendation or is there a better alternative?
- What inspections should be done when new lubricants are delivered?
- Is it a good idea to add more additives to used oils?
- How do I know the optimum point to change an oil?
- How do I clean tanks, reservoirs, and lube storage containers?
- When should I use a synthetic lubricant?
WHAT DO PEOPLE SAY?

The information I learnt can improve our hydraulic systems by 40%.

Vernon Player, PDM Tech, International Paper

This course has provided me an in-depth view on how to create a world-class lubrication program.

Dennis Hill, Facility Engineer, Alcoa

The knowledge I have now will reduce down-time by 50%.

Johnny Dominquez, Mechanic, Phelps Dodge Mining
1 LEVEL

COURSE OUTLINE

How Lubrication Affects Machine Reliability
- The causes of machine failure
- The importance of choosing the right maintenance strategy
- Identifying your current maintenance strategy and how it impacts profitability
- Effective lubrication strategies that prevent failure
- Differentiate when to apply preventive, proactive and predictive maintenance

The Fundamentals of Tribology
- The six components of a tribological system and their importance to reliability
- Six important functions of lubricants
- The fundamental relationship between speed, load and viscosity
- How friction is generated and the impact of wear in lubricated machinery

Key Lubricant Additives
- The three important roles of an additive and how they work to increase lubricant effectiveness
- Eight key additives that enhance lubricant performance and how to choose the right one

Grease Lubricants
- How to select grease thickeners for your application
- How to avoid potential compatibility and performance challenges with more than 13 different types of thickeners
- Using the NLGI to choose the right grease
- What causes grease to dry out and 18 ways to prevent it

Journal & Bearing Application
- The eight most common journal bearing lubrication problems
- How to select journal bearing viscosity based on speed and load factors

Lubricant Application
- Lubrication considerations based on machine type
- How environmental and operational influences affect the lubricant selection process

Lubricant Fundamentals
- The three lubricant film types and the importance of film thickness and critical clearances
- How kinematic and absolute viscosity are measured
- The impact of temperature when determining viscosity selection for your machine
- What causes oil viscosity to change
- Viscosity index and more than 10 characteristics that impact lubricant selection
- How oils and greases are formulated
- The difference between mineral, synthetic and vegetable base oils and when to use each
- Seven important physical properties of a base oil
- The importance of the API’s five base oil categories
- When to select one of the six most commonly used synthetic lubricants and how they differ from mineral bases
- How to interpret ISO, SAE viscosity grades and make the right choice for your application
- Lubricant performance tests and reporting
Food-Grade & Environmentally Friendly Lubricants
• Important requirements for food-grade lubricants
• What you need to know about food-grade additives, base oils and grease thickeners

Used Oil Sampling & Analysis Fundamentals
• Application, types and categories of oil analysis that assure lubrication effectiveness
• Learn industry best practices for oil sampling, including valve and hardware recommendations
• Develop a sampling procedure that identifies machines to sample and optimizes sampling intervals
• Advice for sampling hard-to-reach machines and circulating systems
• Safe, effective, high-pressure sampling from hydraulic systems
• Select from more than 15 different oil analysis tests to find the right data

Equipment Specific Lubrication
• Best practices and critical factors affecting:
  – Rolling-element bearing and lubricants
  – Gear lubricants
  – Compressor lubricants
  – Steam and gas turbine lubricants
  – Rolling-element bearing lubricants

Lubricating Oil Application Methods
• How to use oil mist and other automatic lubrication methods
• Using pressure spray methods for gearboxes
• How to protect against problems caused by constant-level oilers
• Overview of single-point direct lubrication systems

Hydraulic Fluids
• How to select the ideal hydraulic fluid viscosity for gear, vane and piston pumps
• Nine key hydraulic fluid requirements
• Specific conditions that may require a synthetic hydraulic fluid
• Fire-resistant hydraulic fluids - what you need to know
• Hydraulic system maintenance best practices - 21-point checklist

Lubricating Grease Application Methods
• Advantages and disadvantages of centralised lubrication systems
• Best practices for greasing motor bearings
• The unique problems caused by over-greasing - specific steps to eliminate
• Three critical instructions to give your electric motor rebuild shop
• Comparing single-point and multi-point lubrication options
• How to calculate greasing intervals and quantity
• Best practices for ultrasonic and sonic-based greasing
Essential Field Inspections
- 12 questions your oil filter will answer about your machine
- Visual inspections you can get big results from right now
- Quick tips for using all your senses to inspect lubricants
- Design and inspect for lube excellence
- World-class strategies for accessorising equipment for lubrication excellence
- The critical machine accessories for lubricant inspection, sampling and effective contamination control

Contamination Control
- The seven most destructive contaminants that contribute to lubricant failure and how to control them
- The thermal and oxidation process and its effects on lubricants and additives
- Recognise what causes lubricant degradation
- Recognise the by-products of lubricant failure and wear debris
- Distinguish the specific test that measures the forms of lubricant degradation and wear debris monitoring
- Interpret data to set alarms and limits based upon test results
- The ISO Solid Contaminant Code - understand it and track it
- 10 ways to get more mileage out of portable filter carts
- Guidelines for controlling machine surface fatigue and extending machine life
- The No.1 cause of machine wear and how to manage it
- Best practices for excluding and removing contaminants for extending machine life
- The right way to control contamination in tanks and sumps

Storing, Handling & Managing Lubricants
- How oil filters are rated
- Calculating the clean-up rate for portable filters
- Best practices for removing water contamination from oil
- How to set up a world-class lube room
- How to know when to reject a new oil delivery
- How to optimise your lubricant selection and procurement process
- Lubricant storage, handling and disposal best practices
- Best practices for the maintenance of grease guns and fittings
- Lubricant dispensing options and what you must avoid
- Lubricant coding and identification systems - what works and what doesn’t?
- Portable oil transfer and filter cart selection advice
- How and where to store oil transfer and filter carts
- Understanding and managing lubricant storage life - oil and grease stock rotation principles
Lubrication PM Optimisation & Design
- Five questions to ask about every lubrication PM
- How to rationalise and modernise your lubrication PMs
- What causes grease dry-out and when it should be refreshed

Troubleshooting Lubrication Problems
- Four troubleshooting data-collection guidelines
- How to recognise wear patterns on gear teeth
- 28 tips for preventing gear failures
- How to effectively troubleshoot bearing failures

Lubrication & Oil Analysis Metrics
- Four metrics for measuring lubrication effectiveness
- How to track costs and savings
- Measuring the impact of lubrication excellence on RONA

Oil Drains, Flushing & Reservoir Management
- 10 ways to ensure sump lubricant health
- How to optimise interval-based oil changes
- Strategies for condition-based oil changes
- How to use a bleed-and-feed strategy for extending oil drains
- How to trend oil consumption ratios
- Best practices for oil draining and refilling

Accessorising New Equipment for Lubrication Excellence
- Checklist of important machine accessories for inspections and sampling
- Seven strategic machine accessories for contamination control

Lubricating Grease Application
- What to do before and after installing an electric motor
- How to calculate ideal relubrication volume for electric motors
- How to optimise bearing regreasing intervals
- Strategy for ultrasonic and sonic-based regreasing volume
- How to determine bearing grease fill levels

Lubricant Application
- Seven important guidelines for lubricating plain bearings
- Considerations for proper wormgear lubrication
- Best practices for selecting and applying open gear lubricants
- Relubrication frequency recommendations for gear and grid couplings
- 14 best practices for steam turbine lubrication
- Best practices for process pump lubrication and lubricating compressors

Lubrication Fundamentals
- Factors that influence hydrodynamic lubrication
- Five things that can change oil film thickness
- How gear speed influences lubrication
- Seven lubrication factors for finding the “sweet spot” for energy consumption
Base Oils
- API base oil groups and why they’re important
- How synthetic base oil properties compare
- Strengths, weaknesses and applications for six synthetic base oils
- Compatibility of eight seal materials with different fluid types

Viscosity & Viscosity Index
- Understanding the viscosity/temperature chart
- Cold temperature motor oil viscosity basics
- How oil aging affects oil viscosity
- How slight errors in viscosity selection can result in wear and energy losses
- How to convert required operating temperature viscosity to ISO viscosity grades

Oxidation & Thermal Stability
- How antioxidants alter oil life
- How oxidation stability is measured and why it’s important
- Why varnish, sludge and deposits are a problem
- The typical sequence of events leading to varnish
- Air Release & Foam Control
- Causes of poor air release and foaming in oil
- How to know when oil foam is a problem and how to troubleshoot
- Strategies for controlling aeration and foam

Lubricant Degradation
- How to detect mixed lubricants
- Five ways lubricants degrade irreparably
- Nine ways additives are rendered useless
- Lubricant shelf life - factors to control leakage stability
- How fluid properties affect seal performance
- How to use dye for efficient leak detection
- Pros and cons of quick-stop leak agents

Lubricant Selection & Consolidation
- The seven most critical factors when selecting a grease
- Properties of grease that affect pumpability
- How service temperature affects different grease types
- How grease properties change due to incompatible mixtures
- Importance of grease properties by application
- Eight critical factors for selecting a lubricant
- Basic and advanced approaches for consolidating lubricants
- Matching lubricants to machines based on robustness, price and usage
- Managing the lubricant vendor service and delivery quality
- How new lubricant quality can be compromised
- How to read an oil can
- How to determine when to select a monograde vs. a multigrade oil
- Using bearing speed factors to determine NLGI numbers
- Selection criteria for electric motor grease
- 10 desired properties for refrigeration lubricants
- Five requirements for gear oils and why they’re important
- How to decide when synthetic gear lubes are required
- Three methods for selecting gear oil viscosity
- Conditions when synthetic hydraulic fluids may be required
- How to select the correct hydraulic fluid viscosity
- How the hydraulic fluid selection process can save money
- Four important characteristics every chain lubricant should have
PRIVATE ONSITE TRAINING

Looking for a specific training plan for your team? Both Lubrication Schools Level 1 and 2 are offered onsite to meet your company’s schedules, goals and budgets. Additionally, we can customise any of the course content based on your specific needs.

Many of our customers have utilised this option, either from one plant or facility, or to bring personnel from multiple plants or facilities to one onsite training.

Whether you have 15 or 500 people to train, we can tailor an onsite training course that works for you.

Please contact Sidonie Eccles (sidonie.eccles@theeventfulgroup.com) for private onsite training options.
Lubrication school is brought to you by: