Fundamentals of MACHINERY LUBRICATION

Learn Precision Lubrication Skills for Maximizing Machine Reliability

HERE’S A SAMPLE OF WHAT YOU’LL LEARN:

▶ How to build a safe and effective lubricant storage and handling program
▶ How to rate filters and select the right filtration for the job
▶ Lubricant labeling and coding systems—what works and what doesn’t
▶ Industry’s best procedures for greasing electric motor bearings
▶ How to get the right lubricant in the right place at the right time and in the right amount

ENROLL TODAY!
www.NexusGlobal.com/courses or Call +968.9946.6093 or +968.9628.7714!
Take the Guesswork Out of Machinery Lubrication

If you aren’t using the correct lubricant at the right time in the right quantity and in the right place, you could be doing your equipment more harm than good. Modern lubrication programs have changed considerably from “old school” methods that have been passed down through generations. This course contains a strategic collection of the very best practices for applying and managing lubrication that you can take home and begin using right away.

What You Get When You Attend

» Case Studies
» How-to’s
» Worksheets
» Checklists
» Look-up Charts

When you leave this course, you’ll consider your course manual an indispensable on-the-job reference for years to come.

YOU’LL GAIN PRACTICAL NEW SKILLS THAT YOU CAN USE RIGHT AWAY:

1. **The Secrets of Lubricant Selection**: This course will empower you with the knowledge to understand important lubricant properties and strategies to select the correct lubricant for each machine application.

2. **The Best Practices for Lubricant Storage, Handling and Dispensing**: Learn how award-winning maintenance programs design lube storage areas, dispensing stations and transfer carts.

3. **Grease Gun or Lethal Weapon?**: In the hands of an untrained operator, a grease gun can deliver pressure up to 15,000 psi. That’s 30 times what a typical bearing seal can handle. Once the bearing seal is broken, the bearing is on its way to early failure. This course will teach you proper grease gun practices.

4. **Effective Oil Analysis with Precision Oil Sampling**: Learn how to get data-rich oil samples, exactly where to install oil sampling ports, and what sampling equipment should and shouldn’t be used.

WHO SHOULD ATTEND?

» All Maintenance Professionals
» Lubrication Technicians
» Craftsmen or Millwrights
» Equipment Operators
» Laboratory Analysts
» Lubrication Engineers
» Maintenance Managers
» Maintenance Supervisors
» Manufacturing & Industrial Engineers
» Operations Managers
» Predictive Maintenance Technicians
» Reliability Engineers

WHAT INDUSTRIES WILL BENEFIT?

» Aerospace
» Automotive Manufacturing
» Earthmoving
» Food & Beverage
» General Manufacturing
» Lumber & Wood
» Municipal Utilities
» Petrochemical
» Pharmaceuticals
» Power Generation
» Primary Metals
» Process Manufacturing
» Pulp & Paper
» Rubber & Plastic
» Textile
» Transportation

IF YOU USE ANY OF THESE MACHINES, THIS TRAINING IS A MUST:

» Electric Motors
» Compressors
» Diesel Engines
» Final Drives
» Gas Turbines
» Gearboxes
» Hydraulic Systems
» Hydrostatic Transmissions
» Paper Machines
» Process Pumps
» Rolling Mills
» Steam Turbines
» Blowers/Fans
Solve Water-In-Oil Problems

An Organized & Safe Lubricant Storage Room

Squeeze Maximum Life From Lubricants
Lubricants and hydraulic fluids can have infinite life when specific operating conditions are stabilized. The rising costs of new lubricants and the disposal costs of used fluids are directives for change. Learn a proven action plan for extending fluid life.

Effectively Troubleshoot Lubricant-related Machine Failures

Reduce Electric Motor Failures & Replacement Costs

A More Effective Oil Analysis Program
When the goals of a lubrication program are in sync with the oil analysis program objectives, oil analysis becomes far more effective. Learn how to align the programs for maximum results.

Stop Pesky Oil & Hydraulic Fluid Leaks
Leakage is a festering sore to a machine maintenance program. It is often the symptom of a host of other problems. If left unchecked, reduced machine performance is imminent. Eliminating leakage involves the lubrication and oil analysis programs and should be a principal goal.

Improve Health & Workplace Safety

Create More Effective Lubrication PMs

Compare & Select the Best Lubricants for the Job
With hundreds of lubricant types, base stocks, additive packages and viscosity grades to choose from, how can a person decide which lubricant is right for a machine? The options are endless... Synthetic or hydrocracked?... EP or AW?... Naphthenic or paraffinic?... ISO VG 32 or 68?

Solve Annoying Hydraulic System Problems

Improve Equipment Meantime Between Failures

Spend Less on Lubricants & Filters

Not More

Apply What You Learn & Reap the Benefits

Reduce Energy & Fuel Costs

Effectively Troubleshoot Lubricant-related Machine Failures

Create More Effective Lubrication PMs

Compare & Select the Best Lubricants for the Job
How Lubrication Affects Machine Reliability
> Financial benefits from achieving lubrication excellence
> Four equipment maintenance strategies and when each applies
> Important implementation steps to lubrication excellence

Lubrication Fundamentals
> Six important functions of lubricating oils
> How oils and greases are formulated and why it is important
> How friction is generated in lubricated machinery
> The importance of oil film thickness and critical clearances

Understanding Additives, Base Oils and Grease Thickeners
> How lubricant properties irreparably change
> Seven important physical properties of a base oil
> The importance of API’s five base oil categories
> What causes grease to dry out and 18 ways to prevent it
> How to detect the root causes of lubricant oxidation
> When to select one of the six most commonly used synthetic base oils
> How to use temperature to determine the right base oil for your machine
> How to select grease thickeners for your application

Food-grade and Environment-friendly Lubricants
> Important USDA requirements and government regulations for food-grade lubricants
> What you need to know about food-grade additives, base oils and grease thickeners
> Guidelines for food-grade lubricants

Lubricating Grease Application Methods
> How to protect against incompatible grease mixtures
> Advantages and disadvantages of centralized lubrication systems
> Best practices for greasing motor bearings
> How to control pressure when greasing bearings
> The unique problems caused by over-greasing – specific steps to eliminate
> 3 critical instructions to give your electric motor rebuild shop
> Comparing single- and multi-point lubrication options
> How to calculate greasing intervals and quantity
> Best practices for ultrasonic/sonic-based greasing

Lubricating Oil Application Methods
> Overview of oil lubrication methods and devices
> How to use oil mist and other automatic lubrication methods
> Using pressure spray methods for gearboxes
> Best practices for the maintenance of grease guns and fittings

“ABSOLUTELY AWESOME!
Should reduce downtime 25 to 50 percent.”
Scott Gilreath, Lube Tech, UNICCO

Lubricant Performance Properties
> Key additives that enhance lubricant performance
> Viscosity grades, measurement and reporting
How to protect against problems caused by constant-level oilers  
Overview of single-point direct lubrication systems

Journal Bearing Lubricants
> The 8 most common journal bearing lubrication problems  
> How to select journal bearing viscosity based on speed

Rolling-element Bearing Lubricants
> The nine critical factors affecting rolling-element bearing lubricant selection  
> How to convert required operating temperature viscosity to ISO viscosity grades

Gear Lubricants
> 5 key requirements for gear oil  
> How to select the best viscosity for a gear lubricant  
> Best practice guidelines for storing spare gear boxes – lubrication matters!  
> 10 conditions that may require synthetic gear lubricants  
> Lubrication best practices for enclosed gears – a 12-point checklist  
> Mastering the challenges of open gear lubrication

Automotive and Mobile Equipment
Drive-line Lubricants
> How to read a motor oil label – what really matters  
> The six critical objectives a motor oil must accomplish  
> Understanding API service classifications for engine and gear oils  
> The No. 1 reason automatic transmission fluids fail and how to protect against it  
> Service classifications for automotive greases – how to select  
> Extending engine life – surprising engine oil filter study results

Compressor Lubricants
> Steps you can take right now to combat compressor lubricant failure  
> The most common compressor lubricant stressors  
> When to use synthetic compressor lubricants and why

“Packed with powerful information that can be applied with measurable results, this course provides the right training to influence a cultural change in maintenance and operation organizations.”

Brian Baldwin, Reliability Engineering Manager, Dynergy
Steam and Gas Turbine Lubricants
› Why turbine/generator lubricants are the No. 1 contributor to forced outages
› Comparing steam and gas turbine oils – how they differ
› Checklist for best practice steam turbine lubrication

Hydraulic Fluids
› How to select the ideal hydraulic fluid viscosity for gear, vane and piston pumps
› Nine key hydraulic fluid requirements and why they matter
› 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

Contamination Control
› Strategies for building reliability through contamination control
› The seven most destructive contaminants and how to control them
› Specific steps for managing a proactive lubricant management program
› The ISO Solid Contaminant Code – understand it, track it
› 10 ways to get more mileage out of portable filter carts
› How dirt, metal particles and soot mechanically destroy machine surfaces
› Guidelines for controlling machine surface fatigue and extending machine life
› The No. 1 cause of machine wear and how to manage it
› How to set realistic cleanliness levels for lubricants

“Implementing the basic principles taught during this training would prevent premature failure of most all of our rotating machinery!”
Brittany Russo, Reliability Engineer, Braskem

Oil Drains, Flushing and Reservoir Management
› How to optimize and extend oil change intervals
› Interval vs. condition-based oil changes – pros and cons
› Metrics for monitoring lubricant consumption
› Best practices for oil changes
› Know how and when to perform a flush
› The best procedures for oil draining and refilling
› How and when to use the bleed-and-feed strategy for extending oil drains
› Selecting the right cleaning and flushing procedures

Storing, Handling and Managing Lubricants
› How to set up a world-class lube room
› How to know when to reject a new oil delivery
› How to optimize your lubricant selection and procurement process
› How to implement a lubricant consolidation program and select suppliers
› Used lubricant storage, handling and disposal best practices
› Bulk lubricant storage do’s and don’ts
› Guidelines for storing and handling drums

Effective lubricant contamination control strategies for extending machine life
4 ways water contamination attacks lubricant additives
How to set limits for water-in-oil contamination
Managing the root causes of foam and aeration
Best practices for excluding and removing contaminants
The right way to control contamination in tanks and sumps
How oil filters are rated
Calculating the clean-up rate for portable filters
Best practices for removing water contamination from oil
The unique problems created by varnish – how to remove and stop it
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
Keeping grease fresh – best practices for storage

Design and Inspect for Lube Excellence
World-class strategies for accessorizing equipment for lubrication excellence
Seven critical accessories for lubricant inspection and sampling
The right machine accessories for effective contamination control

Used Oil Sampling and Analysis Fundamentals
What oil analysis can tell you
Types and categories of oil analysis
Applications for oil analysis
Overview of oil analysis tests
Elements of a successful oil analysis program
How clean should oil sample bottles be?
How to find the best sampling locations

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 scent, sound and touch to inspect lubricants

“Until I attended this training, I had no idea how poor our best practices were. Improvements will be easy. Justifications will be easy. Recouping the cost of this class will take about a week!”
Tim Pendley, Mechanical Engineer, Westlake Chemical

“Vendor Neutral Makes a Difference!”
Alfredo Romaro
Maintenance Technician, Kawneer Company

The presentation is full color and high quality, making the information easy to comprehend and remember.
ONSITE TRAINING

Need to train your team, but it’s always been too expensive? More and more companies are realizing the value of bringing training onsite. This flexible and cost-effective option allows you to train as many employees as desired.

The benefits of onsite training are obvious and rewarding:

- Tailored curriculum to address your company's needs in a more personable, intimate setting
- Cost-effective return on investment – with significant savings onsite versus travel expenses and time away from the plant, downtime and schedule disruptions are minimized
- Confidential company issues and solutions may be discussed freely onsite
- Strong team-building opportunities

Lubrication is the foundation of reliability, lubrication training is the catalyst for change, and Noria is the world leader in lubrication and oil analysis education and consulting. Bring us onsite for tailored, private team training – for more information contact Saif Al Obaidani at s.obaidani@nexusglobal.com.
From Our Resource Center...

The Level 1 Study Packet
The Level 1 MLT / Level 1 MLA Study Packet Includes:

- **Flash Card Pack**: 385 flash cards to help you prepare for both ICML Level I MLT and Level I MLA certification.

- **125-Question Practice Exam**: This multiple-choice practice test is a great self-assessment tool and helps you prepare for both ICML Level I MLT and MLA certification. Licensed for use by one person.

- **How To Take A Multiple-Choice Exam**: Includes advice from professionals who have passed ICML certification exams as well as helpful hints for the night prior to the exam, steps to take before entering the exam room, techniques to manage your time during the exam and advice for handling different types of questions.

- **Lubrication Fundamentals**: Discusses lubricant basics, machine elements that require lubrication, methods of application, lubrication, lubricant storage and handling, and lubricant conservation.

- **Oil Analysis Basics**: Presents the fundamentals of oil analysis for machinery condition monitoring in an easy-to-understand format. You’ll learn everything from how to take a proper oil sample to how to select a test slate for your applications.

- **The Practical Handbook Of Machinery Lubrication**: Once you start reading this book, you probably won’t stop until you finish it. It is that easy to read. You’ll find understandable explanations of how lubricants work, what they’re made of and how they break down. Topics ranging from engine lubricants to industrial oils and hydraulic fluids are covered.

Get Certified!
Level I certification testing will be held following the training by the International Council for Machinery Lubrication.

**How To Certify**
There are two ways to register for a certification exam.

- **Online**: www.LubeCouncil.org
- **Phone**: 918-259-2950

**Retail Price**: $410.95
**Your Price**: $355

“…”

**Which Certifications?**
This course is designed to help you prepare for the following ICML certification exams:

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

Find out more about these ICML certification exams at the ICML web site: www.LubeCouncil.org

**What Is ICML?**
The International Council for Machinery Lubrication (ICML) is a vendor-neutral, not-for-profit organization founded to facilitate growth and development of machine lubrication as a technical field of endeavor. Among its various activities, ICML offers skill certification testing for individuals in the fields of machine condition monitoring, lubrication and oil analysis.
Our Trainers

JIM FITCH

Jim Fitch, a founder and president of Noria Corporation, is a highly sought-after consultant and trainer described by his clients as “insightful, dynamic and thorough.” He has advised hundreds of companies on developing their lubrication and oil analysis programs and has taught more than 400 training courses in more than 20 countries.

BOB SCOTT

Bob Scott brings to his courses a wealth of “in the trenches” experience. His practical “how to” advice and engaging teaching style consistently receive top scores from audiences. You’ll reap the benefits from his 25+ years of experience with lubricants, lubrication and oil analysis and come away from the training with solid, practical skills.

“This training set a good foundation of knowledge to make a measurable difference in our lubrication program.”

David Hull, Reliability Supervisor, Holcim, Inc.

JEREMY WRIGHT

Jeremy Wright, a Noria senior instructor, provides a lively interactive forum for learning at his courses. As a consultant, Jeremy has helped numerous Fortune 500 companies develop lubrication procedures, benchmark to best practices and implement world-class lubrication programs.

KARIM IBRAHIM

Karim Ibrahim, a GM, consultant and full owner of K Factor Consultancy, has a passion for training based on the solid belief that correctly trained, positive people are the solid assets for any organization. For over two decades Karim has worked with, lectured and trained sales forces, clients and audiences with extensively diversified educational and cultural backgrounds in the Middle East, Iran, Pakistan, Sri-Lanka, Bangladesh and Ethiopia in technical aspects of Lubricants, HSE, benefit selling, B2B Sales, and general managerial skills. Karim’s corporate culture is from working for 28 years with Mobil and BP. Karim has worked in a variety of cross-functional roles in ever-changing settings and environments.

REGISTRATION INFORMATION

Check-in: Sunday, 7:30 a.m. – 8:00 a.m.
Program: Sunday - Wednesday, 8:00 a.m. - 14:30 p.m.
The fee for Fundamentals of Machinery Lubrication is $3499 USD per person for the 4 day course + $200 USD to take the ICML exam (optional). For fast registration, call +968.9946.6093 or +968.9628.7714. Or fax your registration form to +1 919.488.0067 at any time. The fax line is open 24 hours a day, seven days a week. We will send a confirmation of your registration via e-mail. If your confirmation does not arrive within 48 hours, please contact us to process your registration immediately. Please note, payment is due before the start of the event.

Saif Al Obaidani, Nexus Global United
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Email: S.Obaidani@nexusglobal.com

WHAT’S INCLUDED

Your fee provides you the best training available, a comprehensive manual, a free package of training materials, Continental breakfast, lunch each day and refreshments. Certification exam fees are not included.

CERTIFICATION EXAMS

Certification testing is offered by the ICML following the conclusion of the training course at the same hotel. Please contact the ICML to register for the certification exam or register online at their web site:

International Council for Machinery Lubrication
Phone: 918-259-2950 > Fax: 918-259-0177
E-mail: info@lubecouncil.org > Online: lubecouncil.org