



Machinery Lubrication Analyst I (MLA)

Course Description:

- Machinery Lubrication Analyst I (ML I) give the participants a foundation in lubrication best practices and product knowledge. Learn proven industry methods for selecting, storing, filtering and applying lubricants to boost reliability and decrease maintenance costs. Students will also gain a better understanding of oil analysis and how it can help us make better lubrication decisions.

Why MLA Certification is essential:

- Individuals, companies, and the industry at large are looking for certification for the need of objectivity. A certified individual can present objective evidence of his/her value and capability. Experience is viewed with skepticism for objectivity. However, on the other hand, certification is objective. A certified individual has been examined by experts in his/her field and proven to possess the skills required to carry out the tasks associated with basic aspects of lubricant analysis for machine condition monitoring.



It is the mark of a professional Importance of this certification training:

- This course will empower you with the knowledge to understand important lubricant properties and strategies to select the correct lubricant for each machine application. The certification course helps you learn how award-winning maintenance programs design lube storage areas, dispensing stations and transfer carts.
- Its highly important to learn the four Rs of Lubrication.
- Right lubricant, right time, right quantity and right place. If these four basic elements aren't properly addressed, you could be doing your equipment more harm than good. Learn the newest methods for implementing the best lubrication practices.



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.

Course Objective:

- How Lubrication Affects Machine Reliability
- ▪ Identify what strategy is being used in your plant and how it affects profitability ▪ Lubrication Fundamentals
- ▪ Oil viscosity, film, mineral/synthetic properties, and more
- ▪ Lubricant Application
- ▪ Unique lubrication considerations for machines, work type and speed
- ▪ Application methods and devices Storage and Handling
- ▪ Storage, handling and disposal best practice
- ▪ Bulk do's and don'ts Contamination Control
- ▪ 10 ways to get more mileage out of filters=
- ▪ How dirt, metal particles and soot destroy machine surfaces
- ▪ Essential Field Inspections
- ▪ Get big results from simple, visual inspections

WHO Should attend?

- Machinery Covered All Maintenance Professionals, Gearboxes Reliability Engineers, Hydraulic Systems Lubrication Engineers, Electric Motors Craftsmen and Millwrights Compressors Equipment Operators, Final Drives Maintenance Managers, Diesel Engines Lubrication Technicians, Paper Machines Manufacturing and Industrial Process Pumps Engineers Steam Turbines, Maintenance Supervisors Gas Turbines, Predictive Maintenance Technicians Blowers/Fans Lubricant Industry Professionals Rolling Mills Laboratory Analysts Hydrostatic Transmissions Operations Managers And more

Course topics

I-Maintenance Strategies (10%)

- A Why machines fall.
- B. The impact of poor maintenance on company profits
- C. The role of effective lubrication in failure avoidance
- D. Lube routes and scheduling
- E Oil analysis and technologies
- F. Equipment ageing and identification.

II-Lubrication Theory/Fundamentals (18%)

- A Fundamentals of tribology
- B. Functions of a lubricant
- C Hydrodynamic lubrication (sliding friction)
- D. Elasto-hydrodynamic lubrication (rolling friction)
- E. Mixed-film lubrication
- F. base-oils
- G. Additives and their functions
- H. Oil lubricant physical and chemical properties
- Grease lubrication
- 1. How grease is made
- 2. Thickener types
- 3. Thickener compatibility
- 4 Grease lubricant physical and chemical properties

Course topics

III Lubricant Selection (30%)

- A. Viscosity selection
- B. Base oil type selection
- C Additive system selection
- D. Machine specific lubricant requirements
 - 1. Hydraulic systems
 - 2. Rolling element bearings
 - 3. Journal bearings
 - 4. Reciprocating engines
 - 5. Gearing and gearboxes
- E. Application and environment related adjustments

IV. Lubricant Application (18%)

- A calculation for determining required lubricant volume.
- Calculations to determine re-lute and change frequencies.
- C. When to select oil when to select grease.
- D. Effective use of manual delivery techniques
- E. Automatic delivery system
 - a. Automated grease options
 - b. oil mist system
 - c) Drip and wick lubricators
- 2. Deciding when to employ automated lubricators
- 3. Maintenance of automated lubrication systems

Course topics

V. Lube Storage and Management (10%)

- A. Lubricant receiving procedures.
- 8. Proper storage and inventory management
- C. Lube storage containers
- D. Paper storage of grease-guns and lube devices
- E. Maintenance of automatic grease seers
- F. Health and safety

VI Lube Condition Control (10%)

- A Filtration and separation technologies
- B. Filter rating
- C. Filtration system design and Filter selection

VII Oil Sampling (10%)

- A. Objectives for lube oil sampling
 - B. Sampling methods
 - C. Managing interference
 - 1. Bottle cleanliness and management
 - 2. Flushing
 - 3. Machine conditions appropriate for sampling
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VIII Lubricant fare monitoring

A. Lubricant failure mechanisms

1. oxidative degradation

a. The oxidation process

b. Causes of oxidation

C. Effects of oxidative degradation

2. Thermal degradation

a. The thermal failure process

b. Causes of thermal failure

c. Effects of thermal degradation.

3. Additive depletion/degradation

a) Additive depletion mechanism

b) Additives at risk for depletion/degradation

B. treating for wrong or mixed Lubricants.

1. Baseline physical and chemical properties tests

2. Additive discrepancies

C. Fluid properties test methods and measurement units

1 Kinematic viscosity (ASTM D445)

2. Absolute (Dynamic) Viscosity (ASTM 028930)

3. Viscosity index (ASTM D227)

4. Acid Number (ASTM D974 et all)

5. Base Number (ASTM D974 et all)

6. Fourier Transform infrared (FTiR) analysis

7. Rotating Pressure Vessel Oxidation Test (ASTM2272)

8. Atomic Emission Spectroscopy

IX. Wear Debris Monitoring and Analysis (4%)

Common machine wear mechanisms