

Machine Lubricant Analysis – 1



If you are considering taking the next step in Reliability Centered Maintenance by opting Lubricant based condition monitoring, we may serve as a resource to determine your preparedness & answer questions you may have about the exams. Before appearing in the test, professional need to cover / read & understand the mandatory topics as mentioned in Body of Knowledge of ICML. It is examining more than just textbook information.

Training: Candidate must have received 24 hours of documented formal training as outlined in the Body of Knowledge of the MLA I. For online or recorded training, exercises, lab tasks, practice exams, and review exercises may be included in the training time total but shall not exceed four hours of the required course time. Candidate shall be able to provide a record of this training to ICML that shall include the candidate's name, the name and signature of the instructor, the dates of the training, and the number of hours spent in the training.

Education and/or Experience - Candidates must have at least 12 months experience in the field of lubricant-analysis-based machinery condition monitoring (based on 16 hours minimum per month of experience).

Examination - Each candidate must successfully pass a 100 question, multiple-choice examination that evaluates the candidate's knowledge of the topic. Candidates have three hours to complete the closed-book examination. A score of 70% is required to pass the examination and achieve certification. Contact ICML about the availability of the exam in other languages.

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Body of Knowledge – MLA Level 1

The Level I MLA Body of Knowledge is an outline of concepts that a candidate shall have in order to pass the exam, in accordance with ISO 18436-4, Category I, Annex A.

I. Maintenance Strategies (10%)

- A. Why machines fail
- 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 to assure lubrication effectiveness.
- F. Equipment tagging 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, chemical and performance properties and classifications.
 - I. Grease lubrication
 - 1. How grease is made
 - 2. Thickener types
 - 3. Thickener compatibility
 - 4. Grease lubricant physical, chemical and performance properties and classifications.

III. Lubricant Selection (10%)

- 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. Basic calculations for determining required lubricant volume.
- B. Basic calculations to determine re-lube and change frequencies.
- C. When to select oil; when to select grease.
- D. Effective use of manual delivery techniques.
- E. Automatic delivery systems.
 - 1. Automated deliver options.
 - a) Automated grease systems
 - b) Oil mist systems
 - c) Drip and wick lubricators
 - 2. Deciding when to employ automated lubricators.
 - 3. Maintenance of automated lubrication systems.

V. Lube Storage and Management (10%)

- A. Lubricant receiving procedures.
- B. Proper storage and inventory management.
- C. Lube storage containers
- D. Proper storage of grease-guns and other lube application devices.
- E. Maintenance of automatic grease systems.
- F. Health and safety assurance.

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

VIII. Lubricant health monitoring (10%)

- 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 mechanisms
 - b) Additives at risk for depletion/degradation by the various mechanisms.
- B. Testing for wrong or mixed lubricants
 - 1. Baseline physical and chemical properties tests
 - 2. Additive discrepancies
- C. Fluid properties test methods and measurement units - applications and limitations.
 - 1. Kinematic Viscosity (ASTM D445)
 - 2. Absolute (Dynamic) Viscosity (ASTM D2893)
 - 3. Viscosity Index (ASTM D2270)
 - 4. Acid Number (ASTM D974 et al)
 - 5. Base Number (ASTM D974 et al)
 - 6. Fourier Transform Infrared (FTIR) analysis
 - 7. Rotating Pressure Vessel Oxidation Test (ASTMD2272)
 - 8. Atomic Emission Spectroscopy

IX. Wear Debris Monitoring and Analysis (4%)

- A. Common machine wear mechanisms

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Who should attend this training Program

Maintenance & Reliability Professionals, Lube based Condition Monitoring Engineers, Reliability Engineers, Managers, Directors, Maintenance Supervisors, Engineers & Senior Technicians

ADMISSION PROCESS

Applications will be screened with regard to their suitability for each program. Kindly ensure that your complete online application form reaches the office by the deadline.

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Payment

Payment is due upon receipt of the acceptance letter along with the invoice. Please ensure that the payment reaches the office BEFORE the start of the program. Space in the program may only be ensured after we receive the fee.

Account Title:	FANCO Industrial Solutions (For Local Payments) FANCO Solutions LLC (USA – For International Payments)
Account Number:	Will share on invoice

"in addition to our contract price, 16% Punjab Sales Tax (PRA) will also be applicable as per Punjab Sale Tax on Services Act 2012."

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