Asset Reliability Solutions™

Xamine™ Oil Analysis Program User Guide

Lubrication Engineers, Inc.

www.LElubricants.com
800-537-7683

Xamine™ Oil Analysis

Program Saves Money with Consistent, Accurate Monitoring

- ***Safely extends oil drain intervals*** – Partnering the Lubrication Engineers Oil Analysis Program with extended service interval technologies maximizes uptime and minimizes maintenance costs.
- ***Identifies minor problems before they become major failures*** – State-of-the-art fluid analysis identifies dirt, wear particles, fuel dilution and coolant – contaminants that can cause catastrophic failure or significantly shorten equipment life.
- ***Extends equipment life*** – Monitoring system cleanliness and filtration efficiency gets more out of the equipment you have and can significantly reduce equipment replacement costs.
- ***Maximizes asset reliability*** – Testing and analysis expands your extended service environment to ensure that units are up, running and making money.
- ***Increases resale value*** – Analysis results provide valuable sampling history documentation that can easily justify higher equipment resale values.

Why Xamine?

High Quality Testing

With Xamine™, you can be confident you're testing with a laboratory that knows your equipment better than anyone. LE's independent testing laboratories are ISO 17025 A2LA accredited – the highest level of quality attainable by a testing laboratory, backed by the most stringent accrediting body in the industry. This means that your fluid analysis program is supported by a documented quality system you can depend on to deliver superior testing and customer services.

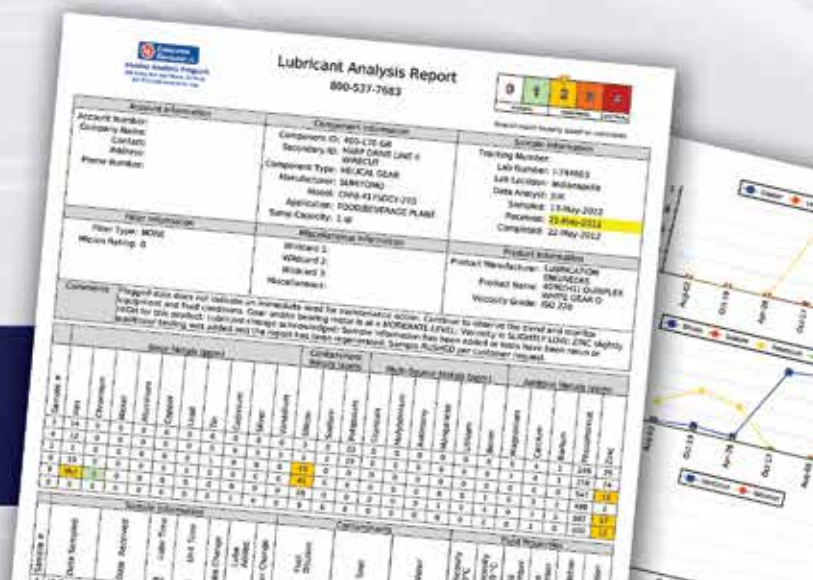
Reliable Reporting & Innovative Data Solutions

Xamine Oil Analysis is fast and accurate. Once your samples have been logged, you can track their progress through the laboratory at **www.eoilreports.com**. Your results are available soon after sample processing is complete. Our online reporting software, **Horizon®**, available at **www.eoilreports.com**, will then show you how to get the most from your data through management reports that allow you to affect change in your daily maintenance practices by:

- Keeping sampling schedules on track
- Identifying bottlenecks in turnaround time
- Tracking unit and fluid performance
- Influencing purchasing decisions

Reviewed by Experts

A lab consultant, LE's corporate personnel and your LE lubrication consultant will all review your reports – ensuring a level of expert support that is unmatched in the industry.



LUBRICATION ENGINEERS, Inc.

Taking Samples

LE's Xamine Oil Analysis Program will show you how regular sampling and trend analysis – monitoring test data over an extended period of time – will provide the information you need to continually maximize asset reliability and increase company profits.

Oil analysis is most effective when samples are representative of the typical environmental conditions under which they operate. Dirt, system debris, water and light fuels tend to separate from lubricants and coolants when system temperatures cool. Samples should be taken while the systems are operating under normal conditions or immediately after shutdown, while they are still at operating temperature.

Samples should also be taken at regularly scheduled intervals and from the same sampling point each time. Although an equipment manufacturer's recommendations provide a good starting point for developing preventive maintenance practices, sampling intervals can easily vary. A major consideration for determining sampling frequency is how critical a piece of equipment is to production. Environmental factors are also important, such as hot, dirty operating conditions, short trips with heavy loads, and excessive idle times.

Whether you're a seasoned veteran or a first-time sampler, a well-designed, quality oil analysis program puts you on track for well-managed, cost-effective equipment maintenance programming.

Sampling Intervals & Methods

	Sampling Interval	Suggested Method & Location
Diesel Engines	Monthly or at 250 hours	By sample extraction pump through dipstick retaining tube or sampling valve installed in filter return
Hydraulics	250 – 500 hours	By vacuum pump through oil fill port or system reservoir at mid-level
Automatic Transmissions	500 hours / 25,000 miles	By vacuum pump through dipstick retaining tube or sampling valve installed in filter return
Manual Transmissions & Differentials	750 hours / 50,000 miles	By vacuum pump through oil level plug or dipstick retaining tube

Xamine Test Packages

	Basic Engine	Advanced Engine	
		Diesel	Natural Gas
Purpose	*Monitors wear & contamination*	*Optimizes drain intervals*	
TESTS	Engines	Engines	Engines
Elemental Metals by ICP	■	■	■
Water % by Crackle	■	■	■
Viscosity at 100°C	■	■	■
Fuel Dilution	■	■	
Soot %	■	■	
Base Number		■	
Acid Number			■
FTIR Oxidation/Nitration			■

	Basic Industrial	Basic Industrial with PQ	Advanced Industrial
Purpose	*Monitors wear & contamination*	*Monitors fluid cleanliness*	*Monitors fluid cleanliness & optimizes drain intervals*
TESTS	Non-Engines	Non-Engines	Non-Engines
Elemental Metals by ICP	■	■	■
Water % by Crackle	■		
Water by Karl Fisher, ppm		■	■
Viscosity at 40°C or 100°C	■	■	■
Acid Number	■	■	■
Particle Count (PC)			■
Particle Quantifier (PQ)		■	

Additional testing options are available, including turbine oil analysis.

For more information, contact your LE lubrication consultant today.

LUBRICATION ENGINEERS, Inc.

Xamine™ Spectrometer Guide

Wear Metals

Iron (Fe)	Chromium (Cr)	Lead (Pb)	Copper (Cu)	Tin (Sn)	Aluminum (Al)	Nickel (Ni)	Silver (Ag)	Manganese (Mn)	Titanium (Ti)	Vanadium (V)
Cylinders, gears, rings, crankshafts, liners, bearings, housings, rust	Rings, roller/taper bearing, rods, platings	Bearing overlays, additive in gear oil and gasoline	Bushings, bearings, thrust-washers, friction plates, oil cooler, additive in oil	Bearings, bushings, pistons, platings	Pistons, bearings, pumps, blowers, rotors, thrust-washers	Valves	Bearings, bushings, platings	Trace elements in liners and rings, additive in gasoline	Trace element	Trace element

Contaminants

Silicon (Si)	Boron (B)	Sodium (Na)	Potassium (K)
Element used to determine the level of airborne dirt and abrasives in the oil (sometimes used as an anti-foam agent). Might be from oil anti-foam agent, antifreeze or gasket material.	Present in most permanent antifreeze systems and cooling system inhibitors (sometimes used as an additive).	Present in most permanent antifreeze systems and cooling system inhibitors (sometimes used as an additive).	Present in most permanent antifreeze systems and cooling system inhibitors (sometimes used as an additive in gear oil).

Physical Data

Viscosity	TAN	TBN	Partical Quantifier	Oxidation and Nitration
Decrease in viscosity from wrong makeup oil, sheardown of viscosity index improvers, fuel contamination or non-emulsified water contamination. Increase in viscosity from oxidation, wrong makeup oil or solids contamination.	Total Acid Number. The relative acidity of the oil. Increasing TAN indicates oxidation or acid contamination. Usually run on non-engine samples.	Total Base Number. Amount of alkaline additive material (alkaline reserve) available to absorb or control acid. Decreasing TBN indicates additive depletion. Primarily run on engine oils.	Detects and measures the mass of ferrous wear debris within the lubricant sample, regardless of the size of the wear particles present. The result is reported as a PQ index.	Infrared analysis that looks at frequency peaks indicating oxidation and the area indicating nitration. Used on dry-fueled engine – testing to relate nitration levels.

Additive Metals

Magnesium (Mg)	Calcium (Ca)	Barium (Ba)	Phosphorus (P)	Zinc (Zn)	Molybdenum (Mo)
Lightweight housings or casings, or oil additive as a detergent or dispersant	Oil additives usually used for detergents or dispersants	Could be detergent oil additive	Anti-wear or antioxidant oil additive	Anti-wear additive	Anti-wear additive

Non-Metallic Contaminants

Fuel	Soot	Water
Percent fuel contained in the oil sample. Excessive fuel dilution impairs the oil's lubricating qualities and is indicative of operation or maintenance defect.	Measures the amount of combustion solids in the oil sample. May be mostly carbon from incomplete combustion, but can also be oxidized/nitrated fuel.	Percent water found in the oil sample. Could be from cooling system leaks, condensation due to frequent shutdowns, low-temperature operations, poor sump ventilation, or outside water contamination.

How To Read Your Fluid Analysis Report

Xamine reports produce a wealth of important data and useful recommendations for identifying and correcting the root cause of abnormal conditions. Use the report descriptions and explanations below to better understand your results. Your LE lubrication consultant can assist you in effectively using individual test reports as well as taking advantage of the full data management capabilities of the program.

Xamine™ Oil Analysis Program

Lubricant Analysis Report

800-537-7683

0 1 2 3 4 — NORMAL / ABNORMAL / CRITICAL

Overall report severity based on comments.

Account Information		Component Information		Sample Information	
Account Number:		Component ID:	400-170 GB	Tracking Number:	
Company Name:		Secondary ID:	HARP DRIVE LINE 4 WIRECUT	Lab Number:	I-744603
Contact:		Component Type:	HELICAL GEAR	Lab Location:	Indianapolis
Address:		Manufacturer:	SUMITOMO	Data Analyst:	JUK
Phone Number:		Model:	CHHJ-4175DCY-210	Sampled:	13-May-2012
		Application:	FOOD/BEVERAGE PLANT	Received:	21-May-2012
		Sump Capacity:	1 qt	Completed:	22-May-2012

Filter Information		Miscellaneous Information		Product Information	
Filter Type:	NONE	Wildcard 1:		Product Manufacturer:	LUBRICATION ENGINEERS
Micron Rating:	0	Wildcard 2:		Product Name:	4090(H1) QUINPLEX WHITE GEAR O
		Wildcard 3:		Viscosity Grade:	ISO 220
		Miscellaneous:			

Comments: Flagged data does not indicate an immediate need for maintenance action. Continue to observe the trend and monitor equipment and fluid conditions. Gear and/or bearing metal is at a MODERATE LEVEL; Viscosity is SLIGHTLY LOW; ZINC slightly HIGH for this product; Lubricant change acknowledged; Sample information has been added or tests have been rerun or additional testing was added and the report has been regenerated; Sample RUSHED per customer request.

	Wear Metals (ppm)										Contaminant Metals (ppm)			Multi-Source Metals (ppm)						Additive Metals (ppm)				
Sample #	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorous	Zinc
3	14	0	0	0	0	0	0	0	0	0	3	0	23	0	0	0	0	0	0	5	4	1	248	25
4	12	0	0	0	0	0	0	0	0	0	2	0	19	0	0	0	0	0	0	7	4	1	218	24
5	1	0	0	0	0	0	1	0	0	0	43	0	0	0	0	0	0	0	0	0	0	0	547	13
6	19	0	0	0	0	0	0	0	0	0	45	0	0	0	0	0	0	0	1	0	3	2	498	2
7	357	3	0	0	0	0	0	0	0	0	28	0	0	0	0	0	1	0	4	0	7	5	682	17
8	0	0	0	0	0	0	1	0	0	0	9	0	0	0	0	0	0	0	2	0	1	0	602	12

	Sample Information							Contaminants			Fluid Properties					
Sample #	Date Sampled	Date Received	Lube Time mo	Unit Time yr	Lube Change	Lube Added qt	Filter Change	Fuel Dilution % Vol	Soot % Vol	Water % Vol	Viscosity 40°C cSt	Viscosity 100 °C cSt	Acid Number mg KOH/g	Base Number mg KOH/g	Oxidation abs/cm	Nitration abs/0.1 mm
3	19-Oct-2008	28-Oct-2008	2		Yes		Unk			<.1 - Hotplate	395		1.81			
4	26-Apr-2009	05-May-2009	6		Yes		Unk			<.1 - Hotplate	411		1.59			
5	17-Oct-2009	28-Oct-2009	6		Yes		No			<.1 - Hotplate	440		1.55			
6	06-Aug-2010	09-Aug-2010	2	9	No		No			<.1 - Hotplate	190		1.30			
7	13-May-2012	21-May-2012	5	3	Yes		No			<.1 - Hotplate	190		0.28			
8	13-May-2012	18-May-2012	5	5	Unk		Unk			<.1 - Hotplate	193		1.02			

Manufacturer and Model can identify OEM's standard maintenance guidelines and possible wear patterns to expect, as well as the metallurgies involved.

Application identifies in what type of environment the equipment operates and is useful in determining exposure to possible contaminants.

Accurate, thorough and complete information allows for more in-depth analysis and can eliminate confusion when interpreting results.




Equipment and Sample Information

In order to make effective recommendations, LE's data analysts must have complete and accurate equipment and sample information.

Component ID and **Secondary ID** allow each customer to uniquely identify equipment being tested and its location.

Component Type should give as much detail as possible. What kind of compressor, gearbox, engine, etc., influences flagging parameters and depth of analysis. Different metallurgies require different lubrication and have great impact on how results are interpreted.

Severity Status Levels:
0 - Results are normal.
1 - At least one or more items have violated initial flagging points but are still considered minor.
2 - A trend is developing.
3 - Simple maintenance and/or diagnostics are recommended.
4 - Failure is eminent if maintenance is not performed.

Xamine™ Oil Analysis Program
300 Bailey Ave. Fort Worth, TX 76107
817.916.3200 www.le-inc.com

Lubricant Analysis Report

800-537-7683

0	1	2	3	4
NORMAL		ABNORMAL		CRITICAL

Overall report severity based on comments.

Account Information	Component Information	Sample Information
ount Number:	Component ID: 400-170 GB	Tracking Number:
mpany Name:	Secondary ID: HARP DRIVE LINE 4 WIRECUT	Lab Number: I-744603
Contact:	Component Type: HELICAL GEAR	Lab Location: Indianapolis
Address:	Manufacturer: SUMITOMO	Data Analyst: JUK
hone Number:	Model: CHHJ-4175DCY-210	Sampled: 13-May-2012
	Application: FOOD/BEVERAGE PLANT	Received: 21-May-2012
	Sump Capacity: 1 qt	Completed: 22-May-2012
Filter Information	**Miscellaneous Information**	**Product Information**
Filter Type: NONE	Wildcard 1	Product Manufacturer: LUBRICATION ENGINEERS
Micron Rating: 0	Wildcard 2	Product Name: 4090(H1) QUINPLEX WHITE GEAR O
	Wildcard 3	Viscosity Grade: ISO 220
	Miscellaneous	

The **Lab #** is assigned to the sample upon entry for processing and should be the reference number used when contacting LE with questions, concerns or feedback.

Data Analyst's Initials

Make note of the difference between the **Date Sampled** and the **Date Received** by the lab. Turnaround issues may point to storing samples too long before shipping or to shipping service problems. Also noted is testing **Date Completed.**

Filter Type and **Micron Rating** can be important details for the analyst to assess fluid cleanliness and wear levels.

Sump Capacity identifies the total volume of oil in which wear metals are suspended and is critical when trending wear metal concentrations.

Product Manufacturer, Name and Viscosity Grade identify a lube's properties and its viscosity and is critical in determining if the right lube is being used.

Recommendations

A data analyst's job is to explain and, if necessary, recommend actions for rectifying significant changes in the lubricant or the unit's condition. Reviewing comments before looking at the actual test results will provide a road map to the report's most important information. Any actions that need to be taken are listed first in order of severity. Justifications for recommending those actions immediately follow.

Comments	Flagged data does not indicate an immediate need for maintenance action. Continue to observe the trend and monitor equipment and fluid conditions. Gear and/or bearing metal is at a MODERATE LEVEL; Viscosity is SLIGHTLY LOW; ZINC slightly HIGH for this product; Lubricant change acknowledged; Sample information has been added or tests have been rerun or additional testing was added and the report has been regenerated; Sample RUSHED per customer request.

	Wear Metals (ppm)										Contaminant Metals (ppm)			Multi-Source Metals (ppm)						Additive Metals (ppm)				
Sample #	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorous	Zinc
3	14	0	0	0	0	0	0	0	0	0	3	0	23	0	0	0	0	0	0	5	4	1	248	25
4	12	0	0	0	0	0	0	0	0	0	2	0	19	0	0	0	0	0	0	7	4	1	218	24
5	1	0	0	0	0	0	1	0	0	0	43	0	0	0	0	0	0	0	0	0	0	0	547	13
6	19	0	0	0	0	0	0	0	0	0	45	0	0	0	0	0	0	0	1	0	3	2	498	2
7	357	3	0	0	0	0	0	0	0	0	28	0	0	0	0	0	1	0	4	0	7	5	682	17
8	0	0	0	0	0	0	0	1	0	0	9	0	0	0	0	0	0	0	2	0	1	0	602	12

	Sample Information							Contaminants			Fluid Properties					
Sample #	Date Sampled	Date Received	Lube Time mo	Unit Time yr	Lube Change	Lube Added qt	Filter Change	Fuel Dilution % Vol	Soot % Vol	Water % Vol	Viscosity 40°C cSt	Viscosity 100 °C cSt	Acid Number mg KOH/g	Base Number mg KOH/g	Oxidation abs/cm	Nitration abs/0.1 mm
3	19-Oct-2008	28-Oct-2008	2		Yes		Unk			<.1 - Hotplate	395		1.81			
4	26-Apr-2009	05-May-2009	6		Yes		Unk			<.1 - Hotplate	411		1.59			
5	17-Oct-2009	28-Oct-2009	6		Yes		No			<.1 - Hotplate	440		1.55			
	[illegible]	Aug-2010	2	9	No					Hotplate	190		1.30			

Laboratory might request additional unit and lube information if incomplete on sample label.

Elemental Analysis

Elemental analysis, or spectroscopy, identifies the type and amount of wear particles, contamination and oil additives. Determining metal content can alert you to the type and severity of wear occurring in the unit. Measurements are expressed in parts per million (ppm).

Combinations of these **Wear Metals** can identify components within the machine that are wearing. Knowing what metal a unit is made of can greatly influence an analyst's recommendations and determine the value of elemental analysis.

Knowledge of the environmental conditions in which a unit operates can explain varying levels of **Contaminant Metals**. Excessive levels of dust and dirt can be abrasive and can accelerate wear.

Multi-Source Metals and **Additive Metals** could turn up in test results for a variety of reasons. Molybdenum, antimony and boron are additives in some oils. Magnesium, calcium and barium are often used in detergent/dispersant additives. Phosphorous is used as an extreme pressure additive in gear oils. Phosphorous and zinc are used in the anti-wear additive ZDDP (zinc dialkyl-dithio-phosphate).

	Wear Metals (ppm)										Contaminant Metals (ppm)			Multi-Source Metals (ppm)						Additive Metals (ppm)				
Sample #	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorous	Zinc
3	14	0	0	0	0	0	0	0	0	0	3	0	23	0	0	0	0	0	0	5	4	1	248	25
4	12	0	0	0	0	0	0	0	0	0	2	0	19	0	0	0	0	0	0	7	4	1	218	24
5	1	0	0	0	0	0	1	0	0	0	43	0	0	0	0	0	0	0	0	0	0	0	547	13
6	19	0	0	0	0	0	0	0	0	0	45	0	0	0	0	0	0	0	1	0	3	2	498	2

Test Data

Test results are listed according to age of the sample – oldest to most recent, top to bottom – so that trends are apparent. Significant changes are in the yellow areas of the report.

Samples are listed by **Date Sampled** in the lab – oldest first. They are also assigned a **Sample Number** for easy internal tracking. Important to note is whether or not the **Lube** has been **Changed** since the last sample was taken.

Unit Time is the age of the equipment. **Lube Time** is how long the oil has been used.

Viscosity measures a lubricant's resistance to flow at temperature and is considered its most important physical property. Depending on lube grade, it is tested at 40 and/or 100 degrees Centigrade and reported in Centistokes.

	Sample Information							Contaminants			Fluid Properties					
Sample #	Date Sampled	Date Received	Lube Time	Unit Time	Lube Change	Lube Added	Filter Change	Fuel Dilution % Vol	Soot % Vol	Water % Vol	Viscosity 40°C cSt	Viscosity 100 °C cSt	Acid Number mg KOH/g	Base Number mg KOH/g	Oxidation abs/cm	Nitration abs/0.1 mm
1	15-Jun-2012	26-Jun-2012			No		No				30.4		0.67			

	Particle Count (particles/mL)										Additional Testing	
Sample #	ISO Code Based On 4/6/14	> 4 µm	> 6 µm	> 10 µm	> 14 µm	> 21 µm	> 38 µm	> 70 µm	> 100 µm	Test Method	Water by Karl Fischer ppm	
1	9/17/12	2982	713	102	38	16	3	1	0	Laser	140	

The **ISO Code** is an index number that represents a range of particles within a specific micron range, i.e., 4, 6, 14. Each class designates a range of measured particles per one ml of sample.

The **Particle Count** is a cumulative range between 4 and 100 microns. This test is valuable in determining large particle wear in filtered systems.

Fuel and **Soot** are reported in % of volume. High fuel dilution decreases unit load capacity. Excessive soot is a sign of reduced combustion efficiency. (only tested on engine oil samples)

Water in oil decreases lubricity, prevents additives from working and furthers oxidation. Its presence can be determined by crackle or FTIR and is reported in % of volume. Water by Karl Fischer ASTM D6304 determines the **amount** of water present. These results appear in the Additional Testing section of your report.

Sample Information / Component Registration Form

A Sample Information / Component Registration Form is included with every sample kit. Fill it out only when sampling a new component for the first time or to notify the laboratory of a change in component or fluid information already registered with the laboratory. Complete, up-to-date information ensures that you receive the proper testing and an accurate analysis of the results.

Step 1

- Fill out the Sample Information / Component Registration Form completely and accurately.
- Use this form only for first-time samples, changes in unit or fluid information previously submitted, requests for additional testing, and requests that a sample be expedited (rush requests).
- Include it in the mailing envelope with the sample jar.

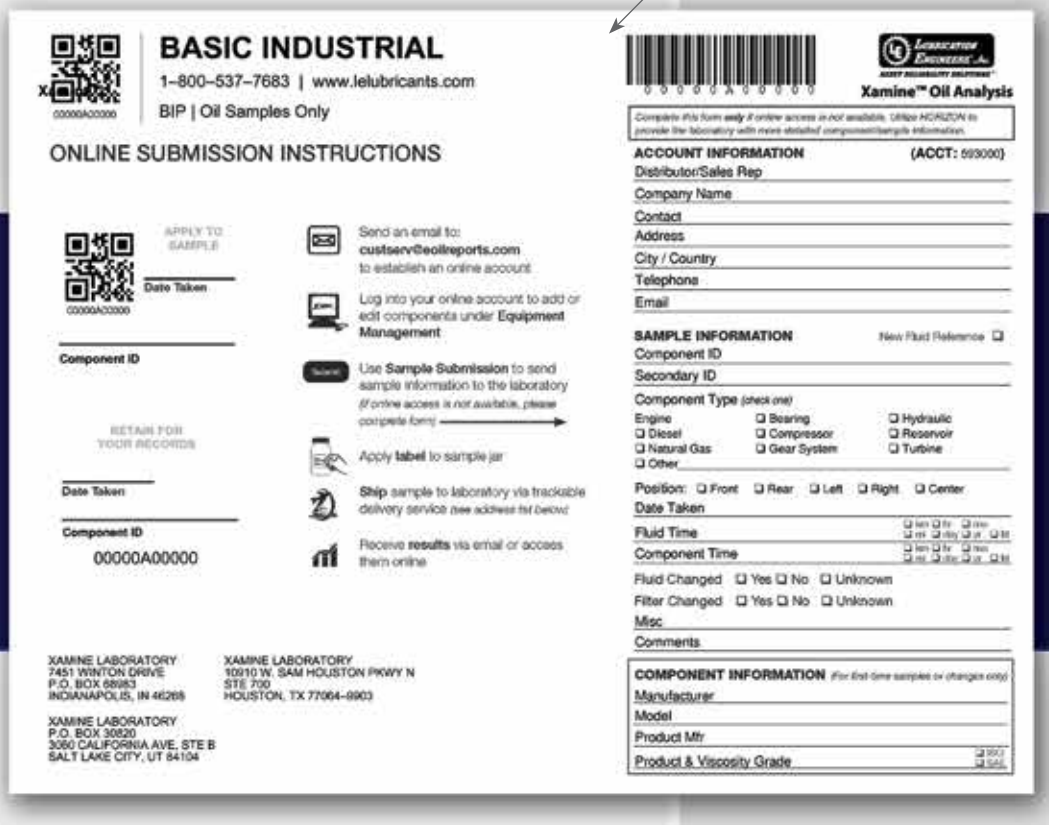
Sample Labels

Two barcode labels are provided with every Sample Information / Component Registration Form. Every sample submitted to the laboratory must have a barcode attached to the bottle. Make sure the Component ID is listed on both the barcode label and the paperwork. If your sample is submitted online, you will still need to attach a barcode label – with the Component ID written on it – to the sample bottle.

Step 2

- Attach one barcode sticker label to sample jar and retain the second barcode sticker label for your records.

NOTE: When you provide the most accurate and complete unit and fluid information, your laboratory can deliver the most accurate and complete results and recommendations.



BASIC INDUSTRIAL

1–800–537–7683 | www.lelubricants.com

BIP | Oil Samples Only

ONLINE SUBMISSION INSTRUCTIONS

APPLY TO SAMPLE

Date Taken

Component ID

RETAIN FOR YOUR RECORDS

Date Taken

Component ID

00000A00000

Send an email to: **custserv@oilreports.com** to establish an online account

Log into your online account to add or edit components under **Equipment Management**

Use **Sample Submission** to send sample information to the laboratory *(If online access is not available, please complete form)*

Apply **label** to sample jar

Ship sample to laboratory via trackable delivery service *(see address list below)*

Receive **results** via email or access them online

XAMINE LABORATORY
7451 WINTON DRIVE
P.O. BOX 68983
INDIANAPOLIS, IN 46268

XAMINE LABORATORY
10910 W. SAM HOUSTON PKWY N
STE 700
HOUSTON, TX 77064-6903

XAMINE LABORATORY
P.O. BOX 30820
3080 CALIFORNIA AVE, STE B
SALT LAKE CITY, UT 84104

Xamine™ Oil Analysis

*Complete this form **only** if online access is not available. Utilize HORIZON to provide the laboratory with more detailed component/sample information.*

ACCOUNT INFORMATION (ACCT: 693000)

Distributor/Sales Rep
Company Name
Contact
Address
City / Country
Telephone
Email

SAMPLE INFORMATION New Fluid Reference ❑

Component ID
Secondary ID
Component Type *(check one)*

Engine ❑ Diesel ❑ Natural Gas ❑ Other
❑ Bearing ❑ Compressor ❑ Gear System
❑ Hydraulic ❑ Reservoir ❑ Turbine

Position: ❑ Front ❑ Rear ❑ Left ❑ Right ❑ Center
Date Taken
Fluid Time
Component Time
Fluid Changed ❑ Yes ❑ No ❑ Unknown
Filter Changed ❑ Yes ❑ No ❑ Unknown
Misc
Comments

COMPONENT INFORMATION *(For first-time samples or changes only)*

Manufacturer
Model
Product Mfr
Product & Viscosity Grade

Sampling and Shipping

Write the address for the laboratory location nearest you on the mailing envelope. (See address choices on the Sample Information / Component Registration Form.) Apply the appropriate postage and ship. It is highly recommended that a trackable delivery service be used for shipping samples to the laboratory. Log on to **www.eoilreports.com** and enter the tracking number just below the barcode to track your sample's progress once it arrives at the laboratory.

Step 3

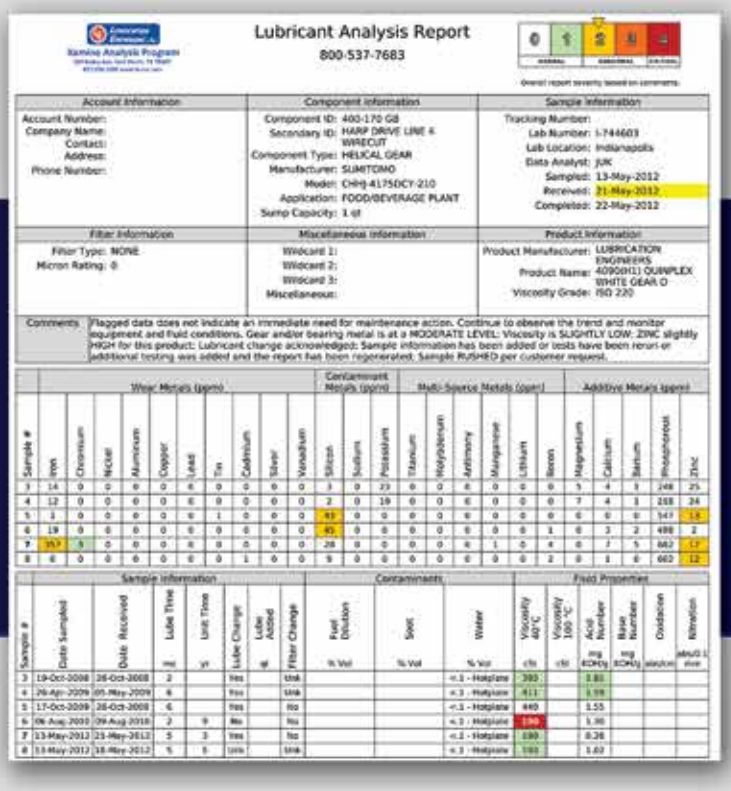
- Take representative samples.
- Write the address for the lab location nearest you on the mailing envelope.
- Include sample jar and component registration form, if applicable, in mailing envelope.
- Ship by trackable delivery service such as FedEx or UPS.
- Track sample progress through laboratory at **www.eoilreports.com**.

Test Reports and Data Management

LE's free online reporting option – **Horizon®** – is fast, bringing you Xamine test results almost immediately after processing is complete. **Horizon®** management reports allow you to make positive changes in your daily maintenance practices by keeping sampling on track, identifying bottlenecks in turnaround time that are costing you money and summarizing unit problems that could influence future purchasing decisions. Control over an extensive host of personal application settings and preferences gives you the power to access the information you need most.

Step 4

- Get test results almost immediately – **FREE** at **www.eoilreports.com**.
- Make positive changes in your daily maintenance practices.
- Keep sampling schedules on track.
- Identify bottlenecks in sample turnaround time.
- Influence future purchasing decisions.
- Be the first to get the information you need most.



Lubricant Analysis Report

800-537-7683

Labaratory Locations

Indianapolis

Salt Lake City

Houston

Indianapolis
7451 Winton Drive
Indianapolis, IN 46268

Houston
10910 W. Sam Houston Pkwy. N. Suite 700
Houston, TX 77064-6314

Salt Lake City
3060 W. California Avenue, Suite B
Salt Lake City, UT 84104

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300 Bailey Avenue • Fort Worth, TX 76107 • Fax: 800-228-1142
LE operates under an ISO 9001 Certified Quality System.

www.LElubricants.com
800-537-7683