OIL ANALYSIS PROGRAM OVERVIEW

LUBEWATCH®

CHEVRON SERVICES CAN HELP YOU **RUN BETTER LONGER**

Serviced by POLARIS Laboratories

LubeWatch®
Oil Analysis Program

Monitor Equipment Performance

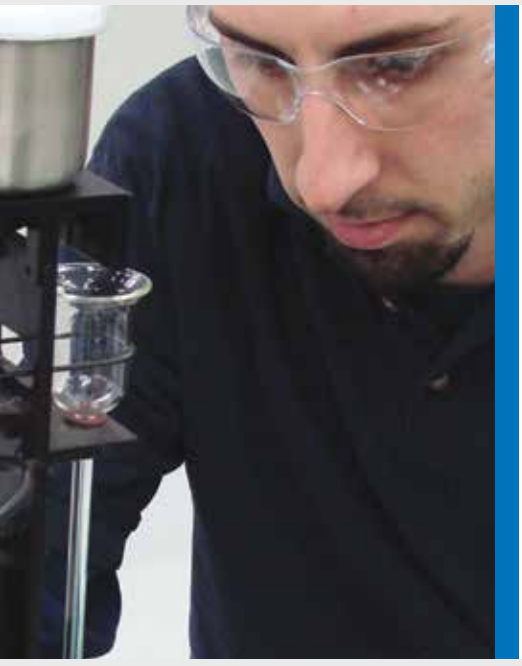
LubeWatch® oil analysis enables you to track the performance of equipment that is the lifeblood of your business. Through regular oil analysis, equipment life and oil replacement intervals can be optimized and lubricant needs can be identified, and the changing environment within the equipment can be monitored. This knowledge helps in the precise scheduling of maintenance work that can reduce downtime or even eliminate the risk of catastrophic failure.

The LubeWatch Oil Analysis Program Provides:

- Accurate results on six basic test packages and a wide variety of specialized testing procedures
- Reliable interpretation of test results and actionable recommendations based on the data
- 24-hour turnaround of tests and analyses (after receipt of the lab) with maintenance recommendations via phone, fax or e-mail in 90 percent of cases
- Advanced technical services including component failure and/or wear particle analysis
- Expert training and in-field counsel and support
- Cost-effective standard and specialty tests
- Added assurance of oil and system integrity when running on an extended oil drain interval program

OIL ANALYSIS HELPS INCREASE EQUIPMENT RELIABILITY

Reduce Maintenance Costs	Schedule Preventive Maintenance More Efficiently
Minimize Equipment Downtime	Minimize Oil Disposal
Maximize Oil Replacement Intervals	Optimize Equipment Life



OIL ANALYSIS CAN HELP YOUR EQUIPMENT RUN BETTER LONGER

Reach a new level of reliability using the LubeWatch Oil Analysis Program. The combination of knowledgeable people, targeted products and customized services such as LubeWatch, can help lower operational costs and maximize equipment uptime. The oil analysis program can be used to identify contamination or wear before it results in costly downtime.

To learn more, contact your marketer.

RBL RUN BETTER LONGER

CHEVRONLUBRICANTS.COM/RBL

Standard Test Packages and Specialty Tests

LubeWatch simplifies the process of testing by creating standard test packages for frequent, typical applications. **The six test packages for standard, used oil analysis are:**

C1

LUBRICATION — BASIC

Viscosity @ 40°C or 100°C (mod. ASTM D445)
Trace Elements & Additives (mod. ASTM D5185)
% Water (Crackle Test)[a]

C2

DIESEL CRANKCASE

Viscosity @ 100°C (mod. ASTM D445)
Trace Elements & Additives (mod. ASTM D5185)
% Water (Crackle Test)[a]
Glycol (ASTM D2982)
Fuel Dilution (ASTM D7593)
Fuel Soot by Wilks Soot Meter
Base Number (mod. ASTM D4739)

C3

NATURAL GAS

Viscosity @ 100°C (mod. ASTM D445)
Trace Elements & Additives (mod. ASTM D5185)
% Water by Karl Fischer (mod. ASTM D6304C)[a]
Oxidation (ASTM E2412)
Nitration (ASTM E2412)
Acid Number (mod. ASTM D664)

C4

INDUSTRIAL OILS

Viscosity @ 40°C (mod. ASTM D445)
Trace Elements & Additives (mod. ASTM D5185)
% Water by Karl Fischer (mod. ASTM D6304C)[a]
Oxidation (ASTM E2412)
Nitration (ASTM E2412)
Acid Number (mod. ASTM D664)
C4 PC: Includes all tests from C4 plus Particle Count (mod. ISO 11500)

C5

METAL WORKING FLUIDS

Viscosity @ 40°C (mod. ASTM D445)
Trace Elements & Additives (mod. ASTM D5185)
% Water by Karl Fisher (mod. ASTM D6304C)[a]
Chlorine (ASTM D5384)
Sulfur (ASTM D4951)
% Fat (ASTM E2412)

C6

TURBINE OILS

Viscosity @ 40°C (mod. ASTM D445)
Trace Elements & Additives (mod ASTM D5185)
% Water by Karl Fisher (mod. ASTM D6304C)[a]
Oxidation (ASTM E2412)
Particle Count (mod. ISO 11500)
Water Separability (ASTM D1401)
Oxidation by Rotary Pressure Vessel (ASTM D2272)

[a]For all paper machine oils and any oils in which free water is detected.

80% of oil analysis program users maximize equipment uptime through the use of oil analysis.*

*POLARIS OUTLOOK 2015 Benchmark Study for the Oil Analysis Industry

ON- AND OFF-HIGHWAY: AGRICULTURE, AUTOMOBILE, CONSTRUCTION, FORESTRY, MASS TRANSIT, MINING & QUARRYING, RAILROAD, TRUCKING

Equipment Type	Suggested Sampling Frequency		Sampling Location
	Hours	Miles	
Diesel Engines	250-500 hours	10,000-20,000 miles	Through Dipstick Retaining Tube or Sampling Valve Installed in Filter Return
Gasoline Engines	-	5,000 miles	Through Oil Level Checkpoint, Dipstick Retaining Tube or Oil Level Plug
Transmissions	500-1,000 hours	20,000-40,000 miles	Through Oil Level Plug or Dipstick Retaining Tube
Gears, Differentials and Final Drives	500-1,000 hours	20,000-40,000 miles	Through Oil Level Plug or Dipstick Retaining Tube
Hydraulics	1,000 hours	40,000 miles	Through Oil Fill Port of System Reservoir at Mid-Level

Always confirm that the sampling frequency is consistent with the original equipment manufacturer's recommendation for the equipment operating conditions and customer's maintenance practices.

MANUFACTURING & PROCESSING AND INLAND MARINE: CEMENT, FOOD & BEVERAGE, MARINE EQUIPMENT, NATURAL GAS DISTRIBUTION, OIL & GAS EXPLORATION, POWER GENERATION, PULP & PAPER, SUGAR MILLS

Equipment Type	Suggested Sampling Frequency		Sampling Location
	Normal Use	Intermittent Use	
Diesel Engines	Monthly 500 hours	Quarterly	Through Dipstick Retaining Tube or Sampling Valve Installed in Filter Return
Natural Gas Engines	Monthly 500 hours	Quarterly	Through Oil Level Checkpoint, Dipstick Retaining Tube or Oil Level Plug
Gas Turbines	Monthly 500 hours	Quarterly	Through Sample Valve Installed Upstream of the Filter on the Return Line or out of the System Reservoir
Steam Turbines	Bi-monthly	Quarterly	Through Sample Valve Installed Upstream of the Filter on the Return Line or out of the System Reservoir
Air, Gas Compressors	Monthly 500 hours	Quarterly	Through Sample Valve Installed Upstream of the Filter on the Return Line or Out of the System Reservoir
Refrigeration Compressors	Bi-monthly	Quarterly	Through Sample Valve Installed Upstream of the Filter on the Return Line or Out of the System Reservoir
Gears, Bearings	Bi-monthly	Quarterly	Through Sample Valve Installed Upstream of the Filter on the Return Line or Out of the System Reservoir
Hydraulics	Bi-monthly	Quarterly	Through Oil Fill Port of System Reservoir at Mid-Level

77% of oil analysis program users find that using information from oil analysis test results to improve their maintenance program helps their equipment perform more reliably.*

*POLARIS OUTLOOK 2015 Benchmark Study for the Oil Analysis Industry

Add LubeWatch® To Your Maintenance Program

69%
of oil analysis program users have used oil analysis test results to optimize oil drain intervals up to two times that of the standard drain.*

The LubeWatch Process

Submitting oil or other lubricants for LubeWatch oil analysis is simple. Contact your Chevron representative, or visit www.chevronlubricants.com to contact the LubeWatch program lab nearest your location. The lab will set up your account and send a sampling kit to you. After pulling a sample, simply send it back with complete sample information to the lab in the LubeWatch mailing container.

Most sample tests will be completed within 24 hours of receipt at the laboratory. You will receive an email to activate your HORIZON account and set a password. This allows you to view test results and submit sample information on HORIZON (www.eoilreports.com) or the HORIZON oil analysis app (free to download on Android and iOS devices). Select a default email setting to receive sample reports. You can adjust this setting in HORIZON and customize mobile alerts in the HORIZON app.+

Set a Foundation for Reliability

The best way to address the future is to have a firm grasp of the present. A detailed profile of the equipment's environment will help LubeWatch identify the oil, fuel and equipment types, applications and special needs. Therefore, it is important to thoroughly fill out a LubeWatch sample information form for all samples—particularly on the initial round. This confidential information will help LubeWatch labs conduct appropriate test procedures to accurately analyze the used oil samples. When complete and accurate equipment information from which the oil sample was taken has been provided, LubeWatch analysts can make the most accurate evaluation and recommendations that benefit your overall equipment effectiveness.

Achieve World-class Performance

Incredible care and attention to detail were brought to every aspect of the LubeWatch oil analysis program development and lab evaluation process. The driving force behind this intensive effort was to bring greater value through accurate and insightful data interpretation—as well as outstanding technical expertise and service—to our marketers and customers. We are very proud of this program and invite you to use our achievement to create new standards of your own.

Contact your Chevron representative for more information.

Reliability is a Commitment

Building reliability into day-to-day business operations takes commitment. We should know. At Chevron, we've created a corporate culture that revolves around safety and reliability. We combine that with our legacy of industry-leading innovation in product formulation. Operating safely and reliably is an extension of who we are, and it sets us apart from lubricant suppliers that just talk about reliability. At Chevron, we live it.

+Email subscription settings can be adjusted in HORIZON. Customize mobile alerts in the HORIZON App.

80% of oil analysis program users report that scheduled downtime saves money compared to the cost of unexpected equipment failures.*

**POLARIS OUTLOOK 2015 Benchmark Study for the Oil Analysis Industry*

Chevron Reliability — The RBL™ Program is our commitment of business support and reliability: Chevron's lubrication expertise combined with superior products and a tailored service program work together to help your business Run Better Longer.

A **Chevron** company product

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