

MINING

FLUID ANALYSIS



Take regular samples representative of normal operating conditions. Send them to POLARIS for testing and analysis.



POLARIS processes the sample. Testing is completed, recommendations are made and a data analysis report is generated.



POLARIS sends the results to the customer via e-mail. The customer evaluates the recommended course of action.



Customer takes action and performs the necessary maintenance.



Harsh operating conditions, extreme load variations and the high-dollar costs involved in equipment replacement make fluid analysis a necessary part of doing business in the mining industry. Routine testing identifies small problems before they become major failures allowing you to meet the demands of your customers on time. Maximize asset reliability and regain control of your production schedules with an effective fluid analysis program by POLARIS Laboratories . . . *it costs so little to protect so much.*

- **Improve Asset Reliability**
- **Increase Equipment Life**
- **Maximize Equipment Performance**
- **Extend Drain Intervals**



**POLARIS
Laboratories, LLC**

It's not just fluid analysis. It's what we do with it.

TOLL FREE 877-808-3750 • www.polarislabs.com

ISO 17025: 2005



The heavy-duty equipment required by mining applications is often exposed to extreme, uncontrollable environmental factors for long periods of time, yet is still expected to maintain maximum performance levels. Contamination and wear are eminent and when left unchecked, can halt production in a heartbeat. Monitoring the condition of both the fluid and the unit through analysis identifies wear-causing contaminants and their effect on component performance. Sampling frequency should be based on the unit's criticality to production, as well as the costs involved in replacement or repair.

Diesel Engines

Routinely monitoring a diesel engine oil's viscosity, as well as its ability to neutralize acids and disperse and suspend soot particles produced during combustion, can indicate whether or not anti-wear additive and dispersant/detergent levels are providing sufficient engine protection.

TEST PACKAGE - OIL

Basic - monitors both the unit and the fluid for wear and contamination

- 24 Metals by ICP
- Viscosity @ 100°C
- % Fuel Dilution
- % Soot
- % Water by Crackle

TEST PACKAGE - WATER BASED FLUIDS

Testing monitors water levels to maintain fire-resistance capabilities and pH to avoid acid formation and maintain system cleanliness.

- 18 Metals by ICP
- pH
- % Water
- Particle Count

TEST PACKAGES - DIESEL FUEL

Go/No Go - can detect problems causing fuel filter plugging and determine fuel's impact on fuel filter life

- ICP Metals
- Pour Point
- Water & Sediment
- Bacteria, Fungi & Mold
- Thermal Stability

Advanced - can determine if product in storage tanks complies with required supplier specifications

Test include Go/No Go package plus:

- Viscosity
- % Sulfur
- API Gravity
- Flash Point
- Cetane Index
- Cloud Point
- Distillation

TEST PACKAGES - COOLANT

Level 1

The following tests monitor coolant maintenance levels to ensure proper engine metal protection, glycol levels for freeze and boil point control, nitrite for prime metal pitting protection and acidity/alkalinity for adequate corrosion protection.

- Visual (color, oil and/or fuel contamination, magnetic/non-magnetic precipitation & odor)
- Freeze Point
- Nitrates
- pH
- Glycol
- Boil Point
- Foam
- TDS (Total Dissolved Solids)
- Specific Conductance
- Carboxylic Acid (ELC only)

Level 2

Level 2 testing monitors the corrosive attributes of the coolant itself - acidic or alkaline - in addition to metal movement - the corrosiveness of each metal affected.

This level includes all Level 1 tests plus:

- Total Hardness
- SCA Number
- Corrosion Metals & Inhibitors - Iron, Copper, Aluminum, Lead, Tin, Zinc, Calcium, Magnesium, Phosphate, Borate, Molybdate, Silicate

Level 3

Level 3 testing identifies possible sources of problems detected in testing levels 1 and 2 such as combustion gas leaks, air contamination, electrical ground problems, localized over-heating, chemical breakdown or other contamination sources inside or outside the system.

This level includes all tests in Levels 1 & 2 plus:

- Contaminants & Inhibitors - Chloride, Nitrite, Phosphate, Sulfate, Glycolate

Gear Systems

Although contamination by dirt and water should be closely monitored in manual transmissions, differentials, final drives and planetaries, the biggest concern for these systems is the type of wear occurring.

- Particle quantifying provides an index of large > 5 microns ferrous wear.
- Particle quantifying with ICP iron values covers small and large ferrous wear to determine if analytical ferrography is necessary.

Advanced

- 24 Metals by ICP
- % Water by Crackle
- Viscosity @ 40°C
- Particle Quantifier

Hydraulics

Hydraulic systems, including automatic powershift transmissions, require a low enough viscosity to minimize friction loss, yet high enough to prevent fluid leakage and protect against wear. Hydraulic fluids should have good oxidation stability to prevent sludge, sufficient water separability and air release properties and resistance to foaming.

Advanced

- 24 Metals by ICP
- % Water by Crackle
- Viscosity @ 40°C
- Particle Count