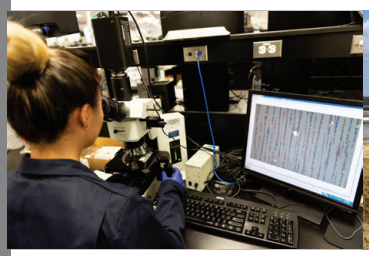
KOMATSU®

Fluid analysis to **protect your equipment**



KOWA
Komatsu Oil & Wear Analysis
USA

OIL AND WEAR ANALYSIS

Why **KOWA?**

KOWA uses highly reputable, independent laboratories across North America to ensure that you are provided with an unbiased appraisal of the condition of your equipment. KOWA's testing facilities are ISO accredited to ensure the highest degree of accuracy and confidence. KOWA offers 'Next-day Turnaround' upon receipt of samples for routine analysis. Oil analysis results are compared to Komatsu guidelines to eliminate any guesswork. KOWA is your best defense for proactively maintaining your equipment.

Optimize the life of your **equipment**

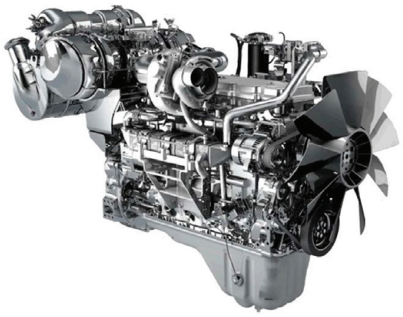
Analyzing engine oil and other fluids is the best way to look inside a machine's engine and powertrain. It can help you identify trends and make informed repair and maintenance decisions.

The Komatsu Oil & Wear Analysis (KOWA) program allows you to pinpoint and solve equipment problems by providing a full range of information on both the lubricant and the machine that can support your operations and maintenance decisions.

The basic KOWA sample identifies abnormal wear and contaminants. Oil life can vary by operating conditions:

- Environment
- Idle Time
- Extended Downtime
- Application Severity

Protect your **modern engine**



KOWA oil analysis with Base Number (BN) is the best tool to get the most out of your oil.

- Avoid unexpected failure due to depleted oil serviceability
- Identify the optimal time to change out a major component

Be aware of your equipment's operating conditions - your oil drain interval may be too long.

Ensure your **coolant** offers the highest protection

KOWA Coolant Analysis helps maintain cooling system efficiency and identify potential problems before they lead to premature engine failures.

- Up to 50% of engine problems can be caused by an improperly functioning cooling system
- Newer engines run hotter, placing more demands on the cooling system
- Optimize coolant serviceability and drain intervals
- Identify issues related to coolant degradation, metal corrosion and scaling

Prolong the life of your **hydraulic system**

Hydraulic testing with ISO Particle Count helps determine the overall level of contamination.

- Up to 85% of hydraulic problems are associated with excessive contamination
- Prolong equipment life by proactively reducing the negative effects of contamination

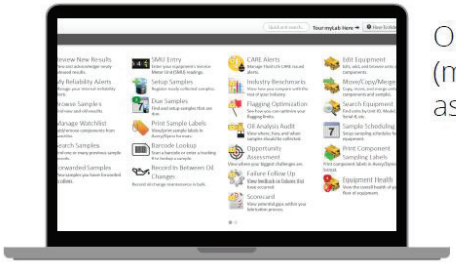
Utilize your oil analysis results to help manage your overall efforts toward contamination control.

Monitor the quality and cleanliness of **diesel fuel**

KOWA Fuel Analysis supports your fuel management program.

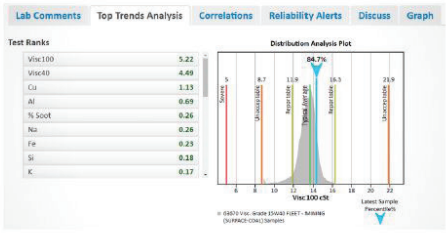
- Diesel fuel contamination is a major contributor to engine trouble
- Early detection of water contamination helps reduce the risk of microorganisms and corrosion
- Microorganisms in diesel fuel can clog filters
- Ultra low sulfur is required to maximize your Tier 4 engine's productivity

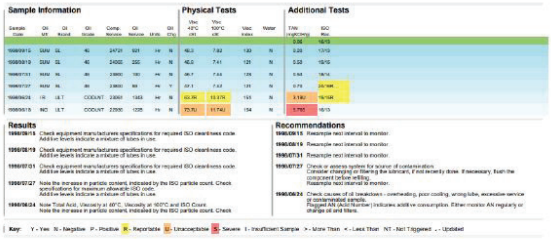
KOWA myLab **Online Reporting**



Online access to KOWA results (myLab) lets you manage all aspects of the testing program.

Powerful reporting tools let you track key findings and overall program statistics.





Quickly identify and resolve components in distress.

Available Testing Packages

Oil Analysis Packages	KOWA-A	KOWA-B	KOWA-C	KOWA-D
Description	**Basic Requirements**	**Tier 4 Engines**	**Standard Powertrain and Komatsu CARE Compliance**	**Advanced Powertrain / Fixed Plant Equip**
ICP Spectrometry (25 Elements) **Viscosity at 40C & 100C** **Viscosity Index** (VI) **Water Contamination** (Crackle Test) **Oxidation/Nitration/Sulfation** (Engines) **Soot %** (Engines) **% Fuel** (Engines) via Gas Chromatography **% Glycol** (Engines) via Gas Chromatography	•	•	•	•
Base Number (Engines)		•	•	•
ISO Particle Count (Hydraulics, Steering, Compressors) **ISO Particle Count with Optical Particle Classification** (Geared Components)			•	•
Acid Number (Hydraulics, Steering, Compressors and Geared Components) **Water %** via Karl-Fischer				•
Lab Turnaround	**End of Next Day**	**End of Next Day**	**End of Next Day**	**End of Next Day**
Sample Volume Requested	**100ml**	**100ml**	**100ml**	**100ml**

Coolant Analysis Packages	KOWACOOLANT-A	KOWACOOLANT-B
Description	**Physical Tests**	**Standard Tests**
Appearance (Odor, Color and Precipitates) **pH** **Conductivity** **Refractive Index** (% Glycol, Freeze Point and Boil Point)	•	•
Nitrites (ppm)		•
Lab Turnaround	**3 Days**	**3 Days**
Sample Volume Requested	**100ml**	**100ml**

Diesel Fuel Analysis Packages	KOWADIESEL-A	KOWADIESEL-B	KOWADIESEL-C
Description (*) indicates an outsourced test	**Fuel Contamination**	**Seasonal Checks**	**Quality Assurance**
ISO Particle Count **Water %** via Karl-Fischer	•	•	•
***Cetane Index** (Includes Density & Distillation) **Bacteria, Fungi & Mold**		•	•
***API Gravity** ***Flash Point** Closed Cup ***Sulphur Content** ***Bottom Solids & Water** ***Pour Point** ***Cloud Point**			•
Lab Turnaround	**End of Next Day**	**7 Days**	**7 Days**
Sample Volume Requested	**1000ml**	**1000ml**	**1000ml**

DEF Analysis Package	KOWADEF
Description	**Standard Requirements**
ISO Particle Count (Microscopy Method) **% Urea**	•
Lab Turnaround	**End of Next Day**
Sample Volume Requested	**100ml**

NOTES:

- (*) indicates an outsourced test
- Prepaid KOWA oil, coolant and DEF analysis kits are sold in cases of 10.
- Prepaid diesel fuel analysis kits are sold on an individual basis.
- Customer is responsible for shipping
- Testing may be performed at an alternate Fluid Life Laboratory without prior notice
- Test results are reported in an abbreviated format
- Contact your KOWA representative for a complete list of additional available individual tests for oil, coolant, diesel fuel, DEF, grease, and filters.

Sample Collection **Procedures**

The accuracy of the laboratory analysis is dependent on fluid sample quality. Collection of clean fluid samples representative of the main body of fluid are necessary for ensuring meaningful lab results. Erroneous readings may result from improper collection, handling, packaging and shipping practices prior to the sample being tested by the lab. For accurate comparison and trending of lab results over time, follow-up samples should be consistently taken from the same location using the same techniques as all previous samples.

- Remove the sample bottle cap only when ready to take the sample. Keep the cap clean. Do not put it in your pocket or let it get contaminated in any way.
- Do not allow any airborne dirt, etc. to enter the sample bottle.
- Avoid contamination of the sample. Replace the sample bottle cap immediately after filling the bottle approximately ¾ full.
- All samples taken should be immediately forwarded to the lab for processing.
- Ensure that all sampling valves and drain plugs are clean and free of debris before taking a fluid sample.
- Refer to the applicable Komatsu machine Service Manual for sample valve and drain plug locations.
- Contact your Komatsu dealer to purchase additional or replacement sample valves or drain plugs.
- In cases where fluid samples must be pumped or otherwise drawn out of a component reservoir or housing, a hand operated fluid suction pump is also available from your Komatsu dealer.

Hydraulic Oil Samples:

- Samples should be taken from the circulating oil flow at operating temperature, with no functions actuated, using sampling valves that are permanently located on the machine.
- To obtain a representative oil sample, sampling valves must be purged before the actual oil sample is taken. Drain a minimum of 3 or 4 ounces of fluid into a separate container and discard this fluid using an approved recycling method
- Replace the dust cover on the sampling valve immediately after taking the oil sample and sealing the sample bottle.

Axle, Bogie, Differential, Gearbox and Planetary Oil Samples:

- Samples from these components are to be taken during the oil change process.
- To obtain a representative oil sample, ensure the oil is warm and has not settled for longer than 30 minutes after shutdown.
- Place the required drain container under the machine component to capture the used oil. This oil should be discarded using approved recycling methods.
- Remove the drain plug and allow approximately 50% of the oil to drain. Then place the oil sample bottle into the stream of draining oil to obtain a representative sample.

Diesel Fuel Samples:

- Samples taken from the machine should be from the fuel tank filler neck at operating temperature. Sample taking may be required from the on-site bulk storage tank or directly from the supplier if further samples are requested by the dealer or Komatsu.
- To obtain a representative fuel sample from the machine fuel tank, clean/remove all debris around fuel cap then remove cap, remove the fuel neck strainer and use a clean fuel siphon pump (for diesel fuel only) to fill sample bottle.

Diesel Exhaust Fluid Samples:

- Clean area around DEF tank fill cap.
- Remove DEF tank filler neck (if equipped).
- Thread sample bottle and tubing onto suction pump.
- Insert plastic tubing into DEF tank.
- Pull plunger on suction pump to collect sample.

Fill out Sample Information forms completely and accurately. If taking multiple fluid samples, fill out all of the required forms in their entirety, prior to taking any fluid samples. Then, immediately package each completed form together with the matching fluid sample in the outer shipping container as each individual sample is taken. This will reduce the possibility of mixing up forms and fluid samples. Incorrectly identified samples could result in a false warning alarm.

KOWA **Benefits**

- ISO accredited independent labs for objective results you can trust
- Results compared to Komatsu guidelines to eliminate guesswork
- Identify minor problems before they become major failures
- Maximize asset reliability/availability
- Reduce life-cycle costs (extend component life)
- Prioritize repairs based on machinery condition
- Better informed reselling and purchasing decisions
- Toll-free access for technical questions and support

KOWA **Lab Locations**

KOWA labs are located in both the U.S. and Canada, but your KOWA results are as close as an internet connection. The KOWA myLab web access provides immediate 24/7 access to reports and data, graphs, transit time statistics and a variety of management reports. Reporting options can be customized for each user by sample severity and can include e-mail notification.

United States
9555 James Ave S #210,
Bloomington, MN 55431

United States
3710 W Royal Ln #145
Irving, TX 75063

Canada
4371 Savaryn Dr SW
Edmonton, AB T6X 2E8

Canada
95 Copernicus Blvd
Brantford, ON N3P 1N4

KOWA
Komatsu Oil & Wear Analysis

Contact your Komatsu distributor today to place an order for KOWA kits. They have everything you need to get started.

For technical support, contact KOWA at 1 (877) 962-2400.

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