

## DESCRIPTION

Used lube oil analysis allows operators to evaluate test results against new oil specifications or absolute condemnable limits, as well as, relative comparisons available through trending over time. Routine lube oil analysis, using ferrography to detect early indications of wear problems, typically utilize microscopic evaluation of iron particles, particle size distribution, and determination of iron content from oil samples which are sent to a laboratory. The DREW XP Wear Debris Analyzer brings this capability onboard and allows non-technical personnel to quantitatively determine the amount of wear rates, such as iron in oil samples, in less than 3 seconds.

The ability to differentiate wear debris over time allows operators to evaluate wear rates with predefined or other statistical criteria. Generally, increase in wear rates can be detected well before equipment would demonstrate degraded state conditions, such as excessive vibration and noise, or an increase in operating temperature. Condition monitoring of machinery lubricants is an established method of predicting and avoiding impending machinery breakdown. The DREW XP Wear Debris Analyzer alerts onboard engineers in identifying worn equipment, before serious damage occurs.

The DREW XP Wear Debris Analyzer provides an accurate means of detecting and measuring ferrous wear debris in lubricating oils, and hydraulic oils, regardless of particle size. Designed specifically to bring laboratory precision onboard, the DREW XP Wear Debris Analyzer delivers reproducible test results in line with test results obtained from larger and more expensive laboratory instruments.

The DREW XP Wear Debris Analyzer is rugged, stable, and compact enough to bring on board, complete the analysis, and optimize the running condition. The test kit is suitable for rigs located in remote areas where landing samples to a shore-based analytical laboratory is impractical and often unreliable.

The technology in the DREW XP Wear Debris Analyzer, alone, can be used to improve operating efficiency, reduce equipment downtime, and increase operational profitability. Engineers on board will be more informed in decision-making, knowing that accurate measurements were utilized when assessing machinery and lubricant condition for planning preventive maintenance programs. For example, having the capability to optimize the main engine cylinder's lube oil feed rate, by analyzing the cylinder drain oil for ferrous wear, essentially pays for the test kit itself many times over.



PCN 1AB2768

## MEASUREMENT PRINCIPLE

Utilizing the latest technology in inductive coil magnetometry, the DREW XP Wear Debris Analyzer detects and measures the ferrous wear debris concentration within a sample, regardless of the range and distribution of wear particle sizes present. Within a few seconds, the test result is displayed in parts per million (ppm) of iron content up to 2,500 ppm with a resolution of 5 ppm.

The DREW XP Wear Debris Analyzer consist of a single sample cell designed for 5 ml test tubes. The test kit also includes zero, low, and high laboratory grade calibration standards that allow nonchemists to initiate an onboard test program.

Since many lubricated systems are comprised mainly of iron, abnormal wear would be occurring if there was a sudden increase in ferrous wear debris detected over time and would thus prompt further investigative action. The respective alarm level limits can be set by the equipment system manufacturer as a known limit, or through trending analysis and family analysis with data collected from the DREW XP Wear Debris Analyzer over a period of operating time. With older equipment, adjusting the acceptable ferrous wear debris level thresholds can be determined using a combination of analyses and operating experience using the particular equipment.

## IRON CONTENT IN LUBE OIL AND HYDRAULIC OIL

Since a majority of the components in lube oil systems (e.g.,



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pumps, actuating cylinders, etc.) are made of iron, ferrous wear debris can be used as a parameter in determining the amount of wear in the system. Unfortunately, once significant amounts of iron have been detected, the actual source of the wear debris is typically very difficult to isolate. In condition monitoring and preventative maintenance programs.

Repeating the test from the same sample points, and duplicating the previously tested results, is important when it comes to determining the actual source of the wear, and avoiding replacement of the system oil, as it would change the baseline conditions already obtained using the DREW XP Wear Debris Analyzer. In combination with a filter and other component inspections and other observations, including recent modifications or process changes to the system, operators can improve the isolation of the wear problems using the DREW XP Wear Debris Analyzer by shortening the time interval, e.g., 50 operating hours, between samples.

By shortening the time interval, operators can eliminate source locations of wear and can pinpoint the section where the wear debris may be originating. If the source of wear debris cannot be determined, continue sampling and monitoring using the DREW XP Wear Debris Analyzer for additional increase in iron content. Keep in mind that the goal is to isolate the problem while it is relatively small, and before it becomes larger and more expensive to repair or replace.

## IRON CONTENT IN CYLINDER DRAIN OIL

Apart from traditional monitoring of cylinder drain oil, optimizing the feed rate for cylinder oil can be done by monitoring the iron content of the cylinder drain oil by using the DREW XP Wear Debris Analyzer. Using the short time interval required for the cylinder oil to be dosed into the cylinder, and to influence the cylinder drain oil quality, the dosage of cylinder oil can be varied and minimized to

achieve the least amount of expensive cylinder oil used at a particular engine load point.

It is recommended, to ensure that the sampling and testing are ongoing, to incorporate and record acceptable engine component wear for various engine loads to capture trending and family analysis comparisons.

## ORDERING INFORMATION

Description	PCN
<b>Reorders</b>	
DREW XP Wear Debris Analyzer	1AB2768
<b>Spares and Replacements</b>	
Power Supply Pack w/adaptor plugs, 24VDC	1AB2824
Sample Tubes & Pipettes Pack, 500 count	1AB2833
<b>Related Products</b>	
DREW XP Wear Corrosion Tester	1AB4425



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