DREW XP WEAR CORROSION TESTER

DESCRIPTION

The DREW XP Wear Corrosion Tester is used for onboard testing to quickly determine the level of non-ferrous iron compounds caused by corrosive wear found in lube oil and to supplement existing tests for ferrous iron. The self-contained test kit includes a comparator, reference color wheel, test reagents with dropper caps, test vials, syringes, gloves, safety goggles, marker pen, and an easy-to-read instruction manual complete with pictures. Test results are available in minutes.

Corrosive wear involves material removal or loss by oxidative chemical reaction of the metal surface in the presence of water. Water in lube oil can be caused by the contamination or degradation of lubricants in service. Confirming water contamination through onboard testing allows operators to take immediate measures to prevent corrosive wear. The DREW XP Water Test Kit (PCN 1AB2766), available separately as a companion test kit, can be used to determine the amount of water present.

CORROSIVE WEAR PARTICLES OF LUBE OIL

Most lubricants contain corrosion inhibitors that protect against corrosive wear. When the lubricant additives become depleted due to extended service or excessive contamination by moisture, bacteria, combustion gases or other process fluids, the corrosion inhibitors are no longer capable of protecting against the acidic (or caustic) corrosive fluid. As a result, corrosion-induced wear or pitting can occur.

Corrosive wear will occur on metal surfaces even on a full oil fluid film whereby no metal-to-metal contact exists. While mild forms of corrosive wear result in surface staining or etching, severe corrosive wear can result in pitting, spalling, or rust. Onboard tests showing elevated concentrations of non-ferrous iron compounds or showing corrosive wear

PCN 1AB4425

particles in lube oil should trigger corrective action to prevent further machinery and/or lube oil problems.

Other measures utilized to reduce wear corrosion include the use of corrosion-resistant metallurgy, improved fluid contamination control from water contamination and acid formation, protective barrier coatings or surface treatments, and corrosion-controlling additives, such as rust inhibitors, metal deactivators, and overbased additives.

CORROSIVE WEAR PARTICLES OF CYLINDER OIL

During engine combustion, a small, controlled amount of acidic gases form and condense on the cylinder liner surface to maintain a very slight roughness to the surface. This slight roughness helps the cylinder oil film adhere to the surface and thus lubricate the cylinder liner. If the cylinder liner becomes too polished, the cylinder oil film will not adhere, and the cylinder liner will then become scuffed.

Acids from low-temperature corrosive wear or “cold”

FEATURES

- The DREW XP Wear Corrosion Tester determines the amount of non-ferrous wear corrosion content present as oxides of iron
- This kit has a range of 20 to 800 mg/kg (ppm)
- This kit contains enough test supplies and reagents for 100 test determinations
- Step-by-step testing procedures complete with pictures
- Results are provided in 5 minutes

BENEFITS

- Provides data to optimize engine, machinery and lubricant life
- Allows regular monitoring of lube oil in service to confirm acceptable non-ferrous wear corrosion content
- Enables operators to take timely measures to adjust base number and feed rate
- Enables operators to save on maintenance and operating costs
- Easy to follow

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corrosion can cause premature cylinder liner wear when the engine is operating at low load conditions. During low load operation, cylinder liner temperatures can fall below the dew point at which point corrosive sulfuric acids form. The amount of corrosive sulfuric acid formation depends mainly on fuel sulfur content.

IMO NOx Tier II and higher rated engines rely partly on relatively lower temperatures in the engine during combustion. Slow steaming, whereby the engines are operated at low load, often well below engine design load, can exacerbate low temperature conditions and subsequently may raise the probability of sulfuric acid formation. Normally, high combustion temperatures effectively burn off any acidic components that form, while cylinder lubricants with a certain level of alkaline content help to neutralize acids that reach cylinder liner surfaces.

Typically, the alkaline content of cylinder oil is selected based on fuel sulfur content. Inadequate base number of cylinder oil used during combustion can lead to high corrosive wear rates. Too high of an alkaline content can result in increased ash deposit formation in the combustion chamber and in the exhaust. Similarly, un-optimized cylinder oil feed rates can also lead to increased deposits as well as increased lube oil consumption.

To manage cylinder oil costs, routine testing of spent cylinder lube oil enables cylinder condition diagnosis and allows an optimized cylinder lube oil feed rate to be determined. Cylinder drain scrape-down oil samples can be sampled from each cylinder stuffing box and tested for non-ferrous wear corrosion content as well as for ferrous wear particles. 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 for a particular engine load and fuel sulfur content while preventing damage.

While the level of corrosive wear particles of cylinder oil can vary from engine to engine, engine manufacturers typically suggest that the amount of corrosive wear particles from each cylinder be no more than 200 mg/kg (ppm). Please consult the engine and lube oil manufacturer with the specific results of the analysis – both can then help further in optimizing oil consumption and in protecting the engine from corrosive wear.

Ferrous deposits can be tested using a separate onboard test kit, DREW XP Wear Debris Analyzer (PCN 1AB2768). The base number of spent cylinder lube oil can be determined using a separate onboard test kit, DREW XP Total Base Number Test Kit (PCN 1AB2763). Please refer to the respective product data sheets for more information regarding these kits.

The ability to determine non-ferrous wear corrosion content, ferrous wear particles, and residual base number over time would allow operators to evaluate complete cylinder wear rates with predefined or other statistical criteria, including fuel sulfur content, cylinder lube oil base number, and engine load.

CLEANUP AND HANDLING

While wear debris particles from rotors, housing, gears, and bearings (ferrous) can be detected with the DREW XP Wear Debris Analyzer , wear corrosion particles, primarily from the upper portion of the receiver tank, (largely non-ferrous) need to be analyzed using the DREW XP Wear Corrosion Tester. The life of downstream components, such as aftercoolers and dryers, is also often compromised by corrosion caused by acid gases, which pass through the compressor from the environment. These gases then condense with water in the coolers and dryers and drastically increase corrosion rates.

The combination of base number analysis with wear debris and wear corrosion detection can enhance compressor life and improve reliability.

The use of harsh chemicals for cleaning test kit instruments and accessories is not advisable. Use only approved cleaning agents (e.g., DREW XP Test Kit Cleaner – PCN 1AB2738) to clean test kit components, and wipe clean using a dry rag. Dispose of the used rag as used oil.

For precautions regarding the reagents included in the test kit, refer also to the DREW XP Wear Corrosion Tester Safety Data Sheet, which is available from your Drew Marine representative.

ORDERING INFORMATION

Description	PCN
Reorders	
DREW XP Wear Corrosion Tester	1AB4425
Spares and Replacements	
DREW XP Wear Corrosion Pack	1AB4428

Contact your Drew Marine representative for more information

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