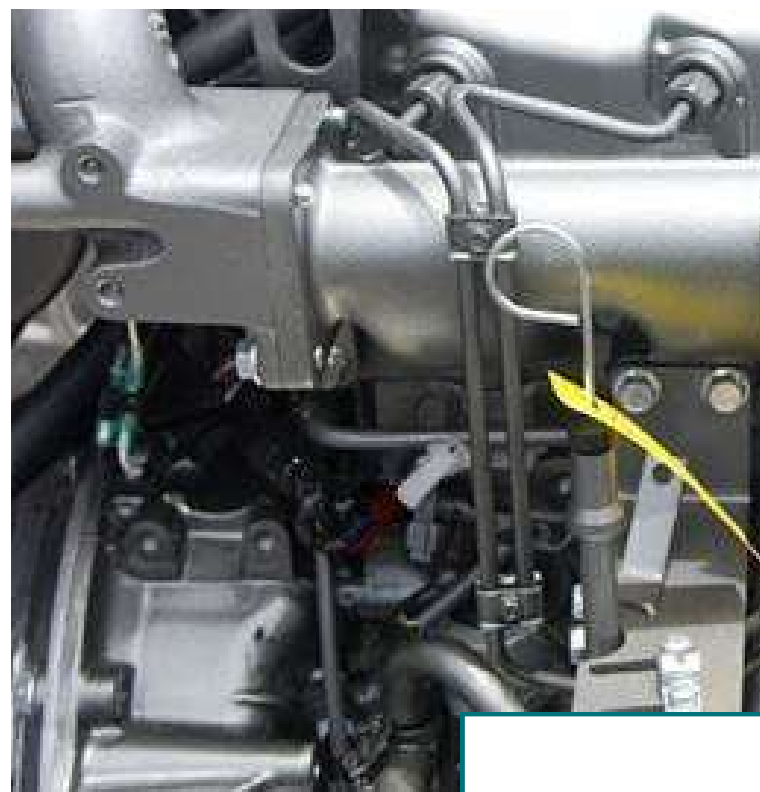
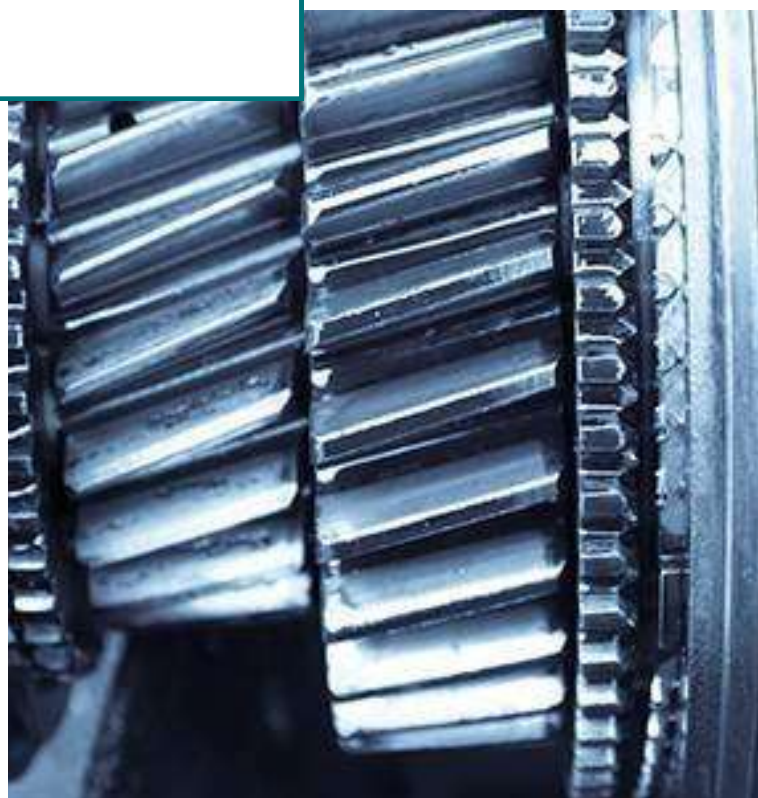




WHAT TESTING?



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What Testing

Regular fluid analysis let you know what is happening in your equipment and how to maximize its lifecycle. Equipment drives your business, and maximizes its performance. Regardless of the type of equipment you use, we are ready to help you make the informed maintenance decisions that keep your business running.

Your most important Assets

In your industry, your equipment is more than an ordinary investment – it's the backbone of your productivity and the driver of your business. For the best operating efficiencies possible, leverage your data to get high quality, actionable recommendations to maximize uptime and extend the life of your equipment.

Engines



Oil analysis can identify the four biggest engine killers before it's too late. Whether you are in the power generation, off-highway, mining or transportation industries, routine testing can tell you what's happening inside your equipment.

Fuel Dilution is the amount of raw, unburned fuel that ends up in the crankcase. It lowers viscosity creating friction-related wear almost immediately. Dilution levels above 10% could cause a crankcase explosion.

Soot is a sign of reduced combustion efficiency and is caused by over-fueling, air restrictions, blow-by, excessive engine brake use and/or excessive exhaust back pressure. Some engine designs are known for creating and retaining soot, but high soot levels still affect the engine and should be reduced as much as possible.

Coolant usually enters an engine through a broken head gaskets, EGR components, cracked cylinder heads, cracked block, faulty water pump or lube cooler and can cause wear in bearings, bushings, pistons, liners, cams and valves.

Dirt is detected by the presence of silicon and aluminum. It causes wear most rapidly in components made of iron, lead, copper and tin, such as pistons, bearings and liners.

Regular oil analysis will identify contamination and abnormal wear, allowing maintenance staff to extend oil drains safely, reduce maintenance costs and increase the life of the equipment.

Compressors



Compressors come in all shapes, sizes and applications. Some are critical to operations, and some are easily replaced. Manufacturing lines, refrigeration and gas compression all rely on compressor uptime, making compressor reliability critical to entire operations.

Lubrication in compressors must have strong resistance to oxidation due to high discharge temperatures and the continuous presence of heated air. The biggest concern is airborne contamination from manufacturing processes, dirt and water, which usually affects viscosity and causes oxidation.

Compressors used in refrigeration also face reduced viscosity problem due to gas entrainment. Regular oil analysis will identify contamination and abnormal wear, reducing maintenance costs and extending the life of the equipment.

Hydraulics



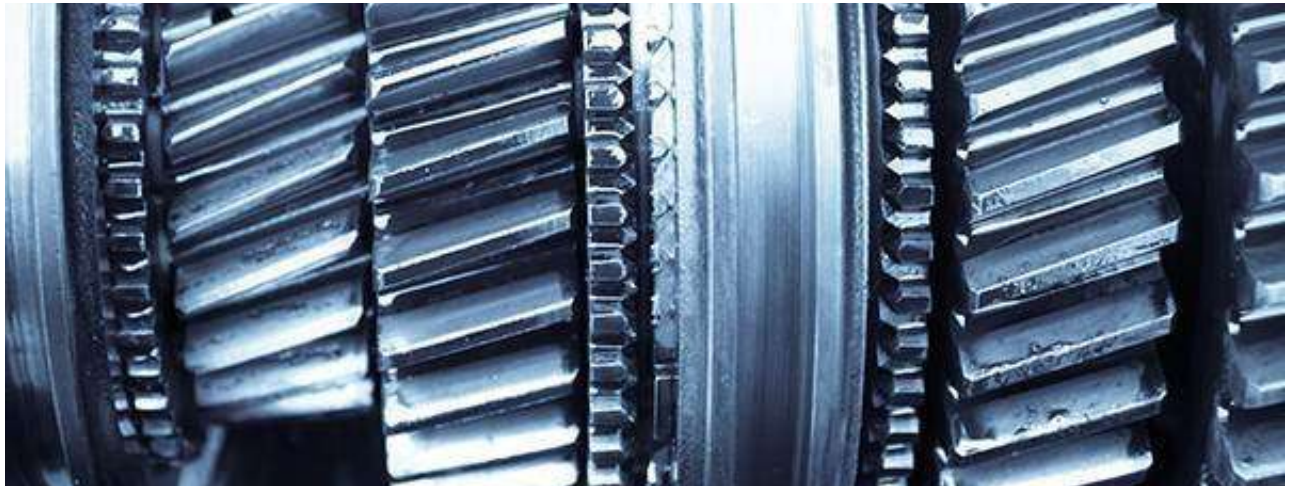
Hydraulic systems operate under extremely close tolerances and high pressure, making them susceptible to small amounts of contamination. Keeping the environment clean in industrial settings can reduce the risk of contamination, but off-highway and mining equipment expose their hydraulic systems to large amounts of dust and water.

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Regardless of the hydraulic system's application, parts of the equipment are constantly exposed to environment. Malfunctioning seals allow abrasives, water and air into the system, causing irregular operations and shorter equipment life. Testing hydraulic fluid will determine if the fluid is capable of maintaining normal operations.

Oxidation stability is required to prevent sludge from forming, and sufficient water separability and air release properties will resist foaming. Hydraulic fluid analysis can also confirm the fluid's viscosity and anti-wear properties.

Gear System



Industrial gearboxes are usually located in cleaner environments than mobile equipment. While mining, off-highway and transportation equipment is more susceptible to water and dirt contamination, vibration due to misalignment and fluid properties is a more common cause of abnormal equipment wear in industrial settings.

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Water and abrasives in the environment typically enter gear systems through malfunctioning seals and breathers and poor maintenance practices. Abrasive particles cause cutting wear between sliding surfaces. Water entrained in oil can cause erosion, corrosion, cavitation and hydrogen embrittlement. Left unchecked, water can saturate the lubrication and become free water, accelerating the damage. Fluid properties break down over time, under stress and under high temperatures.

Oil analysis can ensure the lubricant's viscosity and additives are appropriate for the equipment's speed and load, preventing excessive wear occurs. When contamination and lubricant properties are sufficient, wear may be a sign of equipment vibration caused by misalignment. Oil analysis can supplement regular vibration monitoring programs.

Testing gear lubrication regularly will identify when the fluid needs to be filtered or changed. If problems are caught early, fluid analysis will reduce maintenance costs, extend lubricant life and increase equipment life expectancy.

Turbines



Energy reliability is essential in the world today, so scheduling turbine maintenance can improve the bottom line of any energy generating unit. Oil drains for power-generating turbines are especially expensive because they require other energy producers to cover the gap in the grid, so it's critical to extend drains intervals safely and catch maintenance problems early. Fluid analysis can determine if:

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- Lubrication meets the standards for the extreme working conditions of turbines
- Trends will develop into catastrophic failures
- Changing the fluid will solve a problem
- If varnish (oil oxidation) is occurring

Proper fluid analysis will help you maximize equipment performance while limiting expensive oil changes and unexpected downtime.

Regular oil analysis will identify contamination and abnormal wear, reducing maintenance costs and extending the life of the equipment.

Transmissions



Mobile power transmissions, including differentials, final drives and planetaries are susceptible to dirt and water contamination due to their location on equipment, especially in the off- highway and mining conditions. Plus, the hydraulic qualities of automatic transmissions make them even more sensitive to dirt and water.

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Dirt particles slide between the sets of gears and wear the metal. The end result is larger particles in the lubrication, which accelerates wear further. Water contamination entrained in oil can cause erosion, corrosion, cavitation and hydrogen embrittlement. Left unchecked, water can saturate the lubrication and become free water, accelerating the damage.