

Lubricant Analysis for Electric Vehicles Announced by TestOil

TestOil explains the lubricant needs of electric vehicles (EVs) and the lubricant analysis services the company provides.

CLEVELAND, OHIO, U.S., February 8, 2021 /EINPresswire.com/ -- TestOil, the industry leader in lubricant analysis, explains the lubricant needs of electric vehicles (EVs) and the lubricant analysis services the company provides. This analysis is becoming more and more critical for keeping EVs in optimal operating condition.

Like their internal combustion engine (ICE) counterparts, all EVs require several types of lubes, fluids and greases. While the performance requirements for EVs and ICE vehicles have some similarities, there are important differences that require specialized fluids and analysis.

TestOil President Mary Messuti explained, "Electric vehicles do require lubrication on many fronts. In fact, friction reduction, which extends time between charges, is even more important in these vehicles than it is in ICE vehicles. The fluid performance attributes of electrical conductivity, thermal transfer, copper corrosion protection and elastomer compatibility are key considerations."

Since EVs experience significant fluctuations in power flow and high motor speeds of up to 15,000 RPMs, they can require several fluids such as oil for the gear reducer and an oil specifically to boost cooling for the electric motor. In short, EV fluids need a different balance of properties, including the following:



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*TestOil President Mary
Messuti*

- Lubrication: low EHL traction, wear protection, reduced churning losses, optimized system oil flow, foam and air release, etc.
- Thermal management: high thermal properties and low viscosity
- Electrical properties: good conductivity, breakdown voltage and lack of corrosivity to electronics

Because many EV components, such as seals, are made from materials not typical in an ICE vehicle, there are different material compatibility requirements for EV fluids such as gear reducer fluids and coolant.

Gear Oil /Gear Reducer Fluids

An EV's gear reducer--equivalent to the transmission in an ICE vehicle--is more efficient if it is kept cool. This is a challenge in typical EV high-load conditions. A cooler gear reducer will allow more current to pass through the motor and deliver more torque. In an EV, these fluids come in contact with copper windings, insulation, laminates and rare earth materials—making adequate corrosion protection extremely important. Because there are no friction clutches in the gear reducer, some of the additives in today's ATF may not be necessary—as long as durability of planetary gears and bearings is maintained. Other ATF requirements such as anti-wear protection and contamination control continue to apply.

Coolants

Cooling strategies vary between EV manufacturers, for example: a single water-glycol system for the battery, motors and power electronics; a refrigeration system for the battery and water-glycol for the motor and electronics; and a forced air system for the battery and motors and water-glycol for electronics. EVs are more efficient in general if they can be kept cool. For the coolant, pumping losses have become a huge issue and are driving the need to lower viscosity fluids. Combining lubrication and thermal performance is a major challenge. Efficient cooling requires a specific combination of fluid properties such as high density, high thermal conductivity, high specific heat capacity and low dynamic viscosity. Improving heat transfer impacts other physical properties such as flash point and volatility--major considerations for low viscosity fluids.

In addition to gear oils and coolants, EVs also require specialized lubricants. Thermal management fluids for the battery and power electronics will soon be available to support fast charging and strong acceleration in order to increase range and ensure safety.

Both gear oils and coolants for EVs require a significant amount of additive chemistry—greater than ICE vehicles. While additives often deplete in ways that are unpredictable, this is especially true for today's newest EV fluids. They promise long life and performance, but there isn't much

historical data on the rate of additive depletion.

Another analysis consideration is the widespread use of sophisticated materials in EV components. These components tend to be both critical and expensive, making it important to identify any wear particles in the fluid early on while the components can still be saved and before damage to the vehicle occurs.

These two factors: increased additive chemistry and sophisticated materials; along with the relative newness of many EV fluid formulations, point to the importance of trend analysis for these fluids. TestOil 's expert lab analysts have the skill to gauge additive depletion and evaluate wear particles in all EV fluids—catching issues early while they are still minor and easy to mitigate. To find out more about lubrication: <https://bit.ly/2Mrl6lx>

With more than 30 years of experience in the oil analysis industry, TestOil focuses exclusively on assisting industrial facilities with reducing maintenance costs and avoiding unexpected downtime through oil analysis program implementation. As industry experts in diagnosing oil-related issues in equipment such as turbines, hydraulics, gearboxes, pumps, compressors and diesel generators, TestOil provides customers with a guarantee of same-day turnaround on all routine testing. With in-house, certified training professionals, TestOil offers lubrication and oil analysis training, private onsite training, certification training and exams, and educational webinars. For more information on partnering with TestOil on oil analysis programs or training opportunities visit www.testoil.com. Contact: 216-251-2510; sales@testoil.com.

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