

Sanyo Chemical Develops New Anti-Wear and Anti-Seizure Polymer Additive for EV Drive Units

– Addressing the Challenges of Low-Viscosity Lubricants to Enhance Durability and Efficiency of Electric Vehicles —

Kyoto, Japan – [July 2, 2025] – Sanyo Chemical Industries, Ltd. has developed a new anti-wear and anti-seizure polymer additive, “ACLUBE NS-100,” specifically designed for E-Axle drive units in electric vehicles (EVs). This additive addresses the challenges associated with the trend toward lower-viscosity lubricants for EVs (E-fluid), such as thinner oil films and increased risk of wear and seizure. ACLUBE NS-100 demonstrates excellent anti-wear property and anti-seizure property. In addition, it offers multiple properties required for E-fluid, such as copper corrosion resistance, electrical insulation, and oxidation stability. These features contribute to enhanced durability of E-Axle units and help to improve both the driving range and energy efficiency of EVs.

Background

With the global push for carbon neutrality, electrification of automobiles has been strongly accelerating, and the adoption of highly efficient E-Axle drive units—which integrate the motor, inverter, and gears—is expanding. E-fluid is required to provide a wide range of properties, including anti-wear property, cooling capability, electrical insulation, and copper corrosion resistance. These properties are among the basic requirements for E-fluid.

Recently, E-fluid has become lower in viscosity to improve cruising range by providing cooling properties and reducing viscous resistance. However, this trend results in thinner oil films, increasing the risk of wear and seizure in sliding parts and other mechanical components—a new technical challenge. To address this, Sanyo Chemical has developed a new polymer additive that maintains high anti-wear property and anti-seizure property even in low-viscosity environments, while also meeting the diverse performance requirements of E-fluid.

Product Features

The newly developed ACLUBE NS-100 utilizes Sanyo’s proprietary organic polymer technology, which was cultivated through the ACLUBE series originally developed for engine vehicle lubricants to improve viscosity characteristics. With a unique design that introduces adsorptive functional groups to the polymer side chains, this additive offers the following features:

1. Excellent Oil Film Formation, Anti-Wear Property, and Anti-Seizure Property
 - (1) Adsorptive functional groups on the side chains enable the formation of a sufficiently thick oil film, even at low viscosity.
 - (2) With only 2 wt% addition as the polymer component, ACLUBE NS-100 improves the last non-seizure load by up to approximately 25% compared to the base E-fluid (without additive) (as evaluated by the 4-ball method).
 - (3) Reduces the risk of drive unit failure due to wear or seizure, contributing to higher efficiency and longer life of gear components.
 - (4) IT can be used in combination with other additives, such as phosphorus compounds, for even greater anti-wear and anti-seizure property.

2. Provides the Basic Properties Required for E-fluid

- (1) The optimized organic polymer structure ensures that the product possesses copper corrosion resistance, electrical insulation, oxidation stability, and other essential properties required for E-fluid.
- (2) Performance equal to or better than conventional products has been confirmed through copper strip corrosion tests, volume resistivity measurements, and accelerated oxidation tests.

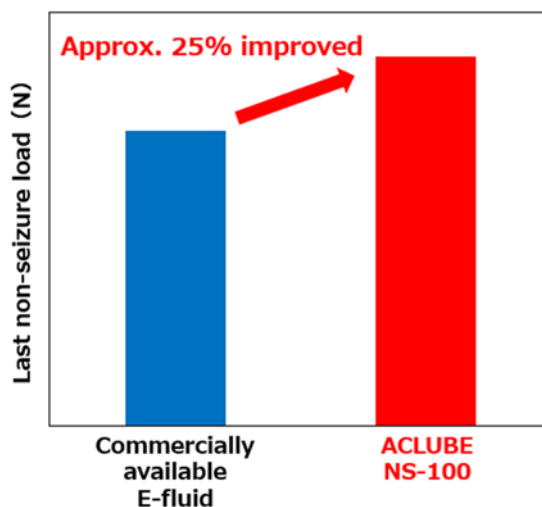
Future Outlook

ACLUBE NS-100 has already been adopted by major customers, having demonstrated high anti-wear property and reliability in field evaluations by domestic and international lubricant manufacturers. Sanyo Chemical will continue to meet the evolving needs of users, drive further innovation, and expand the application of this technology to a wide range of electrified mobility and industrial machinery, contributing to the realization of a more sustainable society.

Reference Data

■ **Anti-Seizure Performance (Seizure Resistance)**

The addition of ACLUBE NS-100 improved the last non-seizure load, an indicator of anti-seizure property, by approximately 25%.



Test conditions: 3.3 wt% of the additive (polymer component: 2.0 wt%) was added to commercially available E-fluid. The evaluation was conducted using a four-ball tester in accordance with ASTM D2783. Test conditions: rotational speed 1760 rpm, room temperature, each load applied for 10 seconds. Test balls: AISI 52100 (diameter 12.7 mm), test oil volume: 10 mL. The load was increased in 40 N increments, and the last non-seizure load (maximum load without seizure) was determined based on the wear scar diameter and the occurrence of seizure.

About Sanyo Chemical

Sanyo Chemical established in 1949 in Kyoto, Japan, is a global manufacturer and seller of performance chemicals. Beginning as a manufacturer of soap and textile agents we have since diversified our product portfolio to meet the needs of the market. Today, we feature over 3,000 diverse types of products and have established an international presence. Our portfolio of chemicals spans a variety of industries and types, from automotive components to daily-use electronics, as well as cosmetics and medical equipment, all with the aim of creating safe and environmentally friendlier offerings, improving lives and societies across the world. We aim to contribute to realize a sustainable society through our corporate activities

<https://www.sanyo-chemical.co.jp/eng>

Contact

Corporate Governance Department

Corporate Planning Division

Tel : +81-75-541-4312

pr-group@sanyo-chemical.group