

## TEST BEFORE YOU DRIVE

Nye's application testing services can provide you with data to help qualify your design. Life and compatibility testing using standard and custom test apparatus are a few of the ways Nye's engineers can assist in validating your design.





# TEST BEFORE YOU DRIVE

**NYE'S APPLICATION TESTING SERVICES FOR THE AUTOMOTIVE INDUSTRY**

## Validating Your Design

Nye Lubricants is a recognized leader in innovative lubrication solutions, which are customized to our customers' applications. When selecting a lubricant for the Automotive Industry, many factors such as material compatibility, operating conditions, and environmental conditions need to be considered.

The service provided by Nye does not end with a lubricant solution that is either custom or selected from our hundreds of existing formulations – it often begins here. A team of highly experienced test engineers in the Applications Development and Validation Testing Lab (ADVT) focus on developing a deeper understanding of lubricant applications and complex mechanical and electrical systems. Applied Tribology testing and targeted component testing/simulation provide the ADVT group with a better understanding of how lubricants function in dynamic applications. This testing helps predict performance, wear, and lifetime more accurately so that we supply you with the solution that best meets your requirements.

For many customers, actual application testing is often unfeasible, as planning and executing simulated application tests in-house are time consuming, costly and require experienced personnel and labs that may not be readily available. Nye's Application Engineers work with you to design and build test equipment or tribological simulations to validate our lubricants for various mechanisms. We collaborate with customers on the initial design, prototyping, and final design to meet their specific needs. Through custom modification and a collaborative partnership, we make sure you get exactly what is needed to ensure confidence for your application.

*Nye's Application Engineers will work with you to design and build test equipment or tribological simulations to validate the lubricant for your component.*

## FRICITION & WEAR

In Nye's Applied Science and Tribology Lab (ASTL), we have a large variety of friction and wear test equipment to ensure all your application needs are met. Flexible testing capabilities in the ASTL allow us to perform very complex tribological tests on a variety of metals, plastics and soft contacts. Nye's experienced Tribology and ADVT engineers provide an expanded toolkit to simulate the contact mechanics of your applications and extend the life of your components.



### SRV Tribometer

The **SRV (Oscillating, Friction & Wear)** test rig runs custom tests with options that include: rotational and linear oscillatory motion, tests up to 2,000 N load, 2,000 RPM, and a maximum temperature of 180°C. Specimens include ball on disc, pin on disc, cylinder on disc, and custom geometries.

### Mini Traction Machine (MTM)

The **Mini Traction Machine** measures friction in a mixture of rolling/sliding contacts to simulate applications, like rolling element bearings and gears. Unlike other tribological tests where speed is either measured as the amount of rotations during a period of time or the oscillatory frequency, the MTM allows for the speed element to be a combination of sliding and rolling speed to produce the entrainment speed. The MTM provides a very good testing method for scuffing and galling of metal surfaces by allowing for the ball and disc to be driven in different directions (contra-rotation). This produces a tribological test that can operate with high sliding/rolling speeds and low entrainment speed.



## ENDURANCE & DURABILITY



### ROF+ Bearing Tester

Lubricant life is critical to rolling element bearings. The **ROF+ Bearing Tester** tests the functionality and life of lubricating greases in rolling bearing applications at various conditions. The ROF+ tests lubricating greases at speeds up to 25,000 RPM (900,000 dmN), temperatures up to 230°C, radial loads of 50-900 N, and axial loads of 100-1,100 N. The standard bearings are 6204 deep groove ball bearings or 7204 angular contact ball bearings, but other geometries including customer supplied can be utilized.

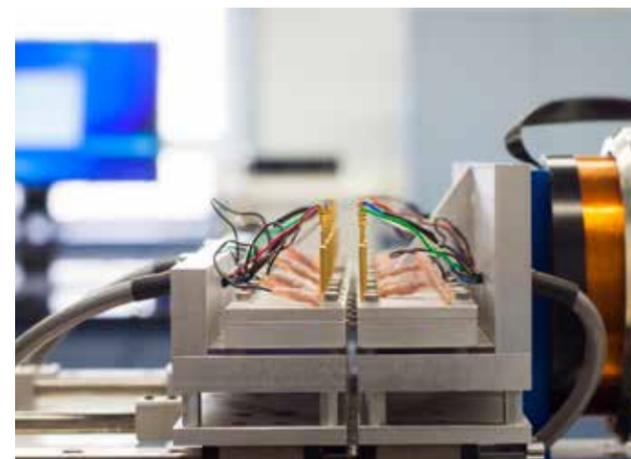
Using this test, we estimate the grease life, temperature limits, and speed factor (dmN) for our products that are to be used in bearing applications.

### Instron Force Testing

Our Instron Tensile Test Rig can affix a wide variety of customer components to test the efficacy of a lubricant in a multitude of linear applications. Applications can range from headrest actuation and feel, to steering column collapsible spline shaft testing. Plotting the required force to move a component throughout its range of motion provides valuable data that can then be relayed back to the customer for approval, or further design considerations. Interchangeable load cells allow the Instron to test components as small as a single electrical connector's insertion force, to components as large as steering columns with splined shafts designed to collapse in the event of a head on collision.



## VIBRATION



### Terminal Fretting Test Rigs

Fretting wear is the result of micromotion caused by vibration or thermal cycles. Wear and oxidation lead to increased friction, heat, degradation, and contact resistance, which leads to the failure of tribo-contacts. Nye's modular fretting test rig, or multi-terminal fretter, allows us to test a variety of components and geometries to ensure our lubricant will outlast your component life requirements. Standard geometries include: cylinder on cylinder, ball on disc, and electrical terminals, but we can accept a wide variety of geometries and supplied components.

This methodology validates the performance of a lubricant in a real-world fretting environment. Durability and life probabilities are then determined to better understand the performance and life improvements made to the system. Life test specs are determined by the customer.

## CUSTOM TESTING



Nye's Application Engineers will work with you to design and build custom test equipment that validates our lubricant for your application. With our custom modification and a collaborative partnership, we can ensure that the test rig meets your application requirements. Nye engineers are currently using the data collected by our test rigs to formulate next-generation greases for the Automotive Industry.

Our custom test rig for **Electric Power Steering** simulates road conditions and life endurance tests on customer supplied EPS units while measuring frictional torque, heat generation, wear, and more. Our EPS Test Rig is composed of three separate rigs that accurately simulate EPS operations: A Magnetic Brake System, On-Road Conditions, and a Parking Check.

### ***Additional Test Capabilities Include:***

- Water Washout Tester
- Falex 4-Ball Wear Stand
- Copper Corrosion Testing

Please contact Nye for a full list of our testing capabilities, or to discuss custom testing options.



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