

Squeaks & Rattles

The DUPONT™ KRYTOX® ADVANTAGE
Newsletter for the Automotive Industry

IN THIS ISSUE

Krytox® Is Indeed Durable!

1

Ending the Noise

1

Friction Test Unveiled at SAE Noise and Vibration Conference

2

Krytox® a “Band-aid”?

3

DuPont Krytox® can be the solution for quieting those squeaks and rattles!

Krytox® Is Indeed Durable!

This issue deals broadly with the subject of durability of Krytox® grease and oil—both, from the perspective of bench testing as well as “real world” results from the field. We hope you find this information valuable, and won’t hesitate to contact us if you have additional questions or comments!

Ending the Noise

The thousands of intricate parts and components that become the backbone and joints of a new automobile must fit and complement each other quietly, without friction or vibration—and the resulting silence should be standard—not an option.

While the customer expects and deserves a smooth, quiet ride, customer satisfaction depends largely on the quality of the lubricant that is used to minimize the shock and stress in the moving parts.

Automotive components lubricated with Krytox® will be silent. In fact, the unique combination of properties in Krytox® will solve your most difficult lubrication problems. The product is compatible with metals, elastomers, engineering plastics, and all automotive fluids. What’s more, it won’t attract contaminants, dust, or dirt. Decreasing surface-to-surface contact by acting as both a lubricant and an isolating film, Krytox® reduces friction, heat, wear—and, best of all, noise.

This exclusive space-age fluoro-polymer-based technology provides long-lasting protection over the broadest range of temperatures. It generally takes a very small amount of Krytox® to be effective and is quite easy to apply. Krytox® is typically a very cost-effective way to silence those unwanted noises!



The miracles of science™

Friction Test Unveiled at SAE Noise and Vibration Conference

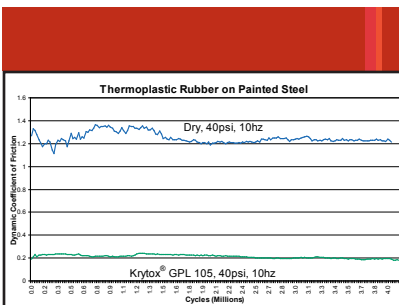
The DuPont Performance Lubricants Group published and presented an S.A.E. paper detailing the development of a new method for determining the coefficient of friction between materials from both a short and long-term perspective. The paper was presented in front of a packed house at the S.A.E. Noise and Vibration Conference and shows great promise toward better understanding the benefits and durability of Krytox® oil and grease in reducing friction levels and associated noises.

The paper, authored jointly by representatives of DuPont and Lewis Research, Inc. of Lewes, Delaware, details the apparatus used, as well as methodology developed to assess the coefficient of friction between a static and oscillating material specimen. Normal loads can be varied from 2 to 40 psi, and the oscillating frequency can range from 0 to 40 Hz. The custom designed soft-ware records at least 40 data points per cycle over the 1 mm oscillation stroke; both static and dynamic coefficients of friction are calculated, recorded, and tracked.

The value of this development can best be understood by reviewing some of the initial data developed.

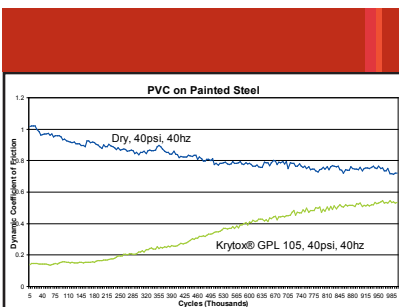
Case 1 T.P.R. on Painted Steel

A commercial grade of Thermoplastic Rubber (T.P.R.) was selected to be oscillated against a sample of painted sheet metal, yielding a coefficient of friction (C.O.F.) of 1.20. A second T.P.R. sample lubricated with a thin film of Krytox® GPL 105 oil prior to testing yielded a C.O.F. of 0.20 – over an 80% reduction! The longevity of this reduction was even more surprising, for after 4 million cycles, the Krytox® lubricated sample remained at the same C.O.F. of 0.20! This data is shown below.



Case 2 P.V.C. on Painted Steel

The same test plan used in Case 1 was employed again, only a commercial grade of P.V.C. was tested instead of the T.P.R. Again, a similar reduction in the C.O.F. was observed by lubricating the P.V.C. with the Krytox® GPL 105 oil. The long-term oscillation curves displayed a slightly different trend, however, as the two slopes showed some convergence, as opposed to the horizontal curves generated by the preceding case. Even after 1 million cycles, however, the sample lubricated with the Krytox® retained a 20% lower C.O.F.



From this work alone, you can see clear differences in how Krytox® performs on different material pairs. Our S.A.E. paper goes into much more detail using the test to explore the impact of varying lubricant parameters such as oil viscosity and film thickness. Our results indicate that this will be an invaluable tool to better anticipate and engineer lubrication solutions to these confounding S&R problems.

In the meantime, if you would like to learn more about this work, or think it might help you in solving your friction/noise problem, please contact your Krytox® representative.

Squeaks & Rattles

Krytox® a “Band-aid”?

Despite its excellent track record in the automotive industry, we occasionally run into engineers who are concerned that Krytox® is not a permanent solution to S&R problems; rather, they consider it more of a “band-aid” or short-term solution.

While a number of variables affect the longevity and durability of Krytox®, many automotive applications using Krytox® have demonstrated it to be a very effective long-term solution to their S&R problems. Actually, the largest application segment for Krytox® grease is found in the most demanding, lubed-for-life bearing applications in the industry, such as fan clutch bearings, alternator bearings, and even conveyor bearings used in the E-coat ovens in auto assembly plants.

One study conducted with General Motors highlights this impressively. Due to internal interest in this very issue, G.M. obtained a number of Chevy Cavalier convertibles from the field that had been in service for as long as four years. Krytox® had been installed on the windshield lace prior to assembly of these vehicles, to solve an itch problem occurring between the urethane lace and the sheet metal of the body. The windshields of these vehicles were removed and lace samples cut from around the windshields. These samples were then tested for any Krytox® remaining, using a sensitive “Fluorine Burn” analysis. Krytox® levels were found to be almost unchanged from the levels originally applied on all of the vehicles tested—even after service lives of up to 4 years!

Please contact your Krytox® representative if you are interested in more details about this study.

**For more information or technical assistance, call DuPont:
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