Volume 31 Number 1

Nye Lubeletter

Synthetic Lubricant News from The SmartGrease™ Company

New Grease Offers Novel Approach to Preventing Arc-Related Bearing Damage

Electrostatic discharge from motor shafts can reduce the life of shaft-support bearings in AC and DC motors from years to a matter of months. Compounding the problem, currents from motor shafts or moving belts can even damage bearings in nearby equipment — a case of "damage by association." It's not a rare occurrence. It's estimated that millions of dollars are lost annually to zapped bearings.

Electrically conductive grease can provide a very economical, low-maintenance path to ground through the bearing. The problem is, most electrically conductive greases aren't very good bearing greases. Traditionally, they're made by mixing oil with metal or carbon thickeners. They're conductive, but they're also abrasive — a quality you don't want in bearing grease. Metals are too loose to "channel," i.e., move to the side to create an oily path on which the rolling element can spin around the race — a quality you do want in bearing grease.

Nye challenged the logic underpinning the formulation of traditional electrically conductive grease. Instead of making conductivity the prime objective, we focused first on making a good bearing grease. We chose a blend of synthetic ester oils for their affinity to metal, and a lithium soap gellant for its excellent channeling ability. Then, instead of relying on metal, carbon, or organic conductive additives to achieve conductivity, we experimented with non-conductive additives. NyoGel® 758G was the result. It has a volume resistivity of 300 ohm-cm, which is comparable to or lower than conductive greases based exclusively on conductive additives and thickeners. In effect, the non-conductive additives in NyoGel 758G work synergistically to create an electron pathway that allows for the efficient transfer of electrostatic currents through the bearing.

Recently, Nye supplied evaluation samples of NyoGel 758G to a paper manufacturer. After four months of tests in motor shaft bearings, the customer reported that voltage readings for bearings lubricated with NyoGel 758G remained in the <3.2V "safe range." Periodic vibration analysis, which can identify electrically induced fluting, confirmed that the bearings had not suffered electrical damage.

The manufacturer's maintenance manager said, "Our test motors have proven that the proper conductive lubricant can protect motor bearings from voltage-induced failure and achieve good mechanical performance as well. (NyoGel 758G) has the earmarks of a good conductive grease as well as a good bearing grease that will add life to our motor bearings." MORE On-line

Nye News Briefs

New regional engineering managers joined the Nye team: Bill Bovensiep at Nye's Detroit office and Al Geldres at the Chicago office.

Transition to Great Plains and Siebel, major upgrades to Nye's ERP, accounting, and CRM systems, moves along at a fast pace. Great Plains went live in January, Siebel in February.

International team expands with the addition of engineers Jason Galary and Christine Szuskiewicz (pronounced shash-ke'-vich). They'll focus on Asian markets.

Dow Corning technology manager Dr. Manfred Jungk of Wiesbaden, Germany, visited Nye headquarters to explore opportunities for collaboration.

MORE On-line

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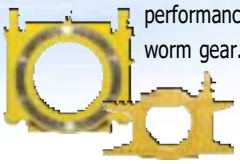
International Corner

5-Ton Grease

Roncari Forklift Attachments, based in Verona, Italy, switched to Nye's Fluorocarbon Gel 875MS when it significantly improved the performance of a cast iron worm gear. The gearbox's five-ton load capacity turns a 360° rotating clamp. Compared to the former grease, Fluorocarbon Gel 875MS — a PTFE-thickened, synthetic hydrocarbon grease — reduced hydraulic pump pressure 23% to 100 bar and extended relubrication intervals from 2,000 to 15,000 cycles. Roncari is served by Tecnolube Seal, Nye's authorized distributor in Italy. MORE On-line



Land Rover, Jaguar, Aston Martin Put Nye on "The Street"

Newgate Simms Ltd., Nye's authorized UK distributor, will present Nye's capabilities to Land Rover, Jaguar, and Aston Martin engineers at the Gaydon Design and Engineering Centre in Warwickshire, the creative focal point for Land Rover and Aston Martin concept, design and engineering work. The 900-acre site, refurbished at a cost of £29.3 million, includes engineering excellence centers, test facilities, a model development center, and "the street," a place to view cars in their natural environment. Newgate will display Nye's wares "on the street" on April 29.

Lubes for Food

NSF International approved two Nye greases and four Nye oils for incidental food contact (H1) for use in and around food processing areas. They include Fluorocarbon Gel 807, NyoGel 670, Nye Synthetic Oils 269, 271, 272, and NyOil®.

The NSF Nonfood Compounds Registration Program is a continuation of the USDA product approval and listing program, which is based on meeting regulatory requirements including FDA 21 CFR for appropriate use, ingredients, and labeling. MORE On-line

Ultrafiltered Grease Improves Precision Bearing Performance and Life

When bearing manufacturers learned how to make a complement of tiny steel balls to within a millionth of an inch, lubricant manufacturers had to figure out how to make grease and oil that wouldn't jeopardize that kind of precision.

Consider a disk drive bearing with 350µ balls. "Filtered" lubricants can have contaminants as large as 75µ. Balls speeding around the race at 10,000 rpm and hitting a 75µ piece of debris would be like a six-foot runner at top speed tripping over a 1-foot high block on the track. The bearing shudders, it jars the read/write head, and data error results — because of a lubricant.

Precision bearing manufacturers minimize such problems with "ultrafiltered" lubricants. There are three cleanliness levels for grease. Unfiltered can contain particles larger than 75µ. Filtered or "clean" grease cannot have any particles larger than 75µ and there must be fewer than 1000 particles/cm^3 between 24µ and 74µ. Ultrafiltered grease must not contain any particles larger than 35µ, nor may it have more than 1000 particles/cm^3 between 10µ and 34µ. There are also five cleanliness levels for oil: 50, 25, 10, 5, and 1, where each number refers to the largest particle in microns allowed in an oil.

Studies have shown that ultrafiltration also makes grease work better in applications where grease starvation is an issue. Ultrafiltration breaks up agglomerated soap thickeners, "homogenizing" the grease so it can slip more easily into the contact zone as a loaded bearing is about to turn. Plus, bearings with ultrafiltered grease usually run quieter.

Ultrafiltered grease can extend bearing life. One United States Army study compared two bearings lubricated with the same grease; one was ultrafiltered, the other was not. The bearing with the ultrafiltered grease ran 200 hours longer. MORE On-line

One place to learn more about grease is in the kitchen. For example, the National Lubricating Grease Institute (NLGI) has a standard classification (Grade 000 to Grade 6) to describe the stiffness of grease at room temperature, a grease characteristic that needs to be properly matched to the temperature range and torque of your product. Check the following table for culinary analogs to these NLGI grades.

NLGI Grade	Food Analog
000	ketchup
00	applesauce
0	brown mustard
1	tomato paste
2	peanut butter
3	vegetable shortening
4	frozen yogurt
5	smooth pâté
6	cheddar cheese spread

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