



# Lubeletter

Synthetic Lubricant News from The SmartGrease Company™

## NEWSClips

**A New Asian Business Development Manager,** Gene Hsu, joined Nye in June. He holds a BSME from Georgia Institute of Technology and an MBA from Georgia Tech. Jay Weikel, who joined Nye in 1995 as a Regional Engineering Manager, recently accepted the new position of EU Business Development Manager.

**Nye sales at mid-year** were up 13.3% over the same period in 2003. President George Mock attributes the performance to “partnering with customers to develop synthetic lubricants that ‘know’ how their products are supposed to perform.”

**Nye received ISO 14001** certification in June, the international standard for controlling and improving a company's environmental performance.

**A new guide to Mil-Spec and NSN** lubricants from Nye is available in the technical literature section at SmartGrease.com.

**Microsoft® Business Solutions** General Manager of Product Planning came to Nye HQ to make sure their new ERP package “meets the needs of companies like Nye.” Nye currently uses Microsoft Great Plains.®



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## New Synthetic Fluid Boosts Performance of Lubes for Auto Components

Experimental synthetic greases formulated at Nye for CV joints and automotive electrical connectors suggest that alkylated naphthalene (AN) blendstocks — synthetic fluids made from a reaction of olefins and naphthalene — offer a value proposition OEMs want: breakthrough lubricant performance without budget-busting cost.

In laboratory tests, a grease made from a blend of AN and select polyalphaolefin (PAO) fluids showed significant performance enhancements over grease made only with PAO oil. PAO greases typically can withstand continuous exposure to temperatures of 125°C, but a grease made from a blend of 10% AN and 90% PAO was still functional after 24 hours at 150°C in an oxygen-rich environment. A 25% AN-blend survived 175°C under the same conditions.

Certain PAOs blended with ANs also showed significant reductions in acid number and viscosity change, further indications of improved oxidation stability.

Blending ANs and specific PAOs also improved antiwear performance when compared to PAO-ester blends. In one test, two oils were subjected to a Four-Ball Wear test (1,800 rpm, 95°C, 80 kg load, 30 min). Oil A consisted of 78% PAO, 20% ester, and 2% antiwear additive. Oil B replaced

the ester with an equal amount of AN. The ester blend resulted in a wear scar of 2.09 mm. The wear scar with the AN blend was only 0.82.

ANs display excellent additive solvency, a plus when compared to ester and ester-blend oils. High polar esters often compete with antiwear additives for a metal surface; so the additive performance may be compromised. The “competition” between the ester and the antiwear additive is minimized when the ester is replaced with AN. Because the AN molecule has a lower affinity for the metal surface, it is less likely to form a lubricant film and interfere with the performance of the antiwear additive.

ANs also show reduced seal swell compared to esters and none of the seal shrinkage associated with PAOs. One polyolester, for example, increased the volume of a fluoroelastomer test strip by 4.7%; an AN of compatible viscosity increased the volume by only 0.8%

While ANs cost more than PAOs, ounce for ounce, using ANs as a blendstock can enable some PAOs to deliver the performance benefits of more expensive synthetic oils at a fraction of the cost.



### ExxonMobil's Synesstic™ AN Blendstocks offer:

- step-out hydrolytic stability
- thermal and oxidative stability superior to mineral oils, PAO, diesters, and alkyl benzenes
- excellent additive solubility
- compatibility with a wide range of elastomers
- non-emulsive properties.



## 12 New Synthetic Food-Grade Lubricants

The faster food processing machinery runs, the more likely it will benefit from synthetic oils and greases.

While many mineral-oil-based products meet the NSF International's food-grade requirements, they often do not measure up to the more demanding temperature and load requirements of modern food, beverage, and pharmaceutical processing equipment.

Like mineral oils, synthetic food grade lubricants are nontoxic, odorless, colorless, tasteless, and conform to the requirements of NSF H-1 for use in and around food processing areas. However, synthetics tolerate both lower

and higher temperatures, offer improved anti-wear properties, extend lubrication intervals, and lengthen the service life of moving parts.

In June, Nye received NSF certification for 12 synthetic food grade lubricants. Formulations include synthetic hydrocarbon, silicone, and perfluoropolyether oils and greases, with temperature capabilities from -50°C to 260°C.

Nye will custom-design synthetic food-grade lubricants to meet a customer's specific operating requirements. We will also be submitting new food-grade lubricants to NSF for registration.



### Food Grade Synthetic Oils and Greases\*

Product	Type	Chemistry	Temp. Range (°C)
DHL 400	Oil	PAO	-40 to 150
NSO 269	Oil	PAO	-50 to 120
UniFlor™ 8320	Oil	PFPE	-20 to 175
UniFlor™ 8620	Oil	PFPE	-20 to 260
NyoGel® 670F	Grease	PAO	-30 to 120
Fluorocarbon Gel 880FG	Grease	Silicone	-40 to 200

\*Partial List

## Experimental Grease Boosts Conductivity and Temperature Range

A new experimental electrically conductive bearing grease boosts the upper temperature limit and the conductivity of its predecessor, NyoGel® 758G.

NyoGel 758G consists of a blend of synthetic ester oils, lithium soap, and a proprietary package of standard lubricant additives that not only fortifies the oil and protects it from oxidation, but also works synergistically to create an electron pathway through the grease. Because NyoGel 758G does not rely primarily on abrasive metal or carbon to achieve conductivity, it has excellent channeling ability, which makes it suitable for long-life bearings.

However, NyoGel 758G's upper temperature limit is 150°C, typical for many ester-based greases. In a new application for a printer bearing, a customer requested a temperature



capability to 180°C, which was achieved by modifying the ester blend. The resistivity of the experimental grease dropped to 388 ohms-cm — nearly a three-fold improvement in conductivity compared to NyoGel 758G.

Electrically conductive grease is one way to help reduce current-related bearing damage. Compared to mechanical and electronic add-ons, electrically conductive grease is very economical. It changes the ground path through the bearing, thereby reducing the likelihood of arcing that pits the rolling elements and damages the raceway.



Get smart about grease

Why not log on to SmartGrease.com to schedule an onsite Lunch & Learn Lubricant Seminar? You provide the meeting facilities and at least 10 engineers; Nye will do the rest.

The *Get Smart About Grease Seminar™* is not a lecture on Nye's products. It is an intensive, interactive presentation about the fundamentals of lubricant engineering. You may choose a basic or more advanced curriculum, depending on the audience's understanding of lubricant chemistry. The seminar includes case studies that show how lubricants are designed for specific products. Case studies can be tailored to your company's products and design concerns.

Companies that have taken advantage of Nye's on-site seminars through July 2004 include Amphenol Aerospace, Applied Materials, Axcelis Technologies, Dana Corp., Delphi Corp., Haldex, Honeywell Aerospace, Jiffy-Tite, Sony, and The Barden Corporation.



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