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Nye® Lubeletter

Synthetic Lubricant News from The SmartGrease™ *Company*

New Connector Grease Slashes Insertion Force, Meets USCAR Standard

UniFlor™ 8917 "knows" how connectors are supposed to perform. A newly commercialized SmartGrease™ for connector contacts, UniFlor 8917 easily meets insertion force and resistance requirements of SAE/USCAR-2, Revision 3, The Performance Standard for Automotive Electrical Connection Systems.

The force required to mate a 6.35 mm terminal lubricated with UniFlor 8917 was 0.8 lbs. on the first mating and 0.3 lbs. on the tenth mating — well below USCAR's 75-Newton (16-pound) insertion force requirement. The average resistance after 10 mates across contacts lubricated with UniFlor 8917 was 0.489 milliohms, easily within the 10 milliohms of resistance allowed by the USCAR standard.

UniFlor 8917 is a novel, high-temperature, perfluoropolyether (PFPE) grease, the result of a two-year collaboration between Nye and one of the world's leading manufacturers of terminal products. Other PFPE connector greases are typically thickened with PTFE, which may burnish into the contact surface and increase resistance. UniFlor 8917 is thickened with urea, which keeps insertion force and resistance low.

The need to reduce insertion force has become as important as avoiding resistance spikes. NIOSH warns that employees who perform repetitive wiring tasks on assembly lines may be at risk of developing musculoskeletal disorders of the hand, wrist, and arm. The risk of injury is exacerbated in the auto industry where workers often have to mate connections in hard-to-reach positions. Consequently, connector manufacturers must address the ergonomics of secure connector mating, a key requirement for good electrical performance.

In the fiercely competitive automotive world, stringent connector design requirements — long life, optimal electrical performance, protection against oxidation and fretting corrosion, and low insertion force — are coupled with the mandate to reduce costs. UniFlor 8917 helps meet this objective as well.

Though PFPE's inertness and broad temperature range make it one of the most expensive synthetic oils, the cost of UniFlor 8917 is reasonable. For 2.8 mm terminals, using 15 mg of grease per terminal, one pound of UniFlor 8917 will lubricate 30,266 terminals at $0.0033 per terminal. For larger 6.35 mm terminals, using 45.9 mg of grease per terminal, one pound of UniFlor 8917 will lubricate 9,891 terminals at $0.01 per terminal. MORE On-line

NEWSClips

Former Torrington Company Manager of Product Technology Dr. Joseph F. Braza is Nye's new Director of Technology. Joe earned a doctorate in 1988 in mechanical engineering from Northwestern, specializing in tribology, and an M.B.A. in operations management from Rensselaer in 1995.

Shell Global Solutions named Nye its exclusive North American distributor for its Pennzane® fluids through 2013.

Dana Industrial Ltda.'s Walter Bordon, Marcus Zucchini, and Gustavo Simião collaborated with Nye's Brian Cichoski on a paper about high performance ball joints for the XII SAE Brazil International Congress and Exposition 2003. Nye designed the grease for the Dana ball joint.

Upcoming shows and seminars for Nye include 2003 Appliance Magazine Industry Tour, starting September 22; Motion System Design's Lunch and Learn seminar, Baltimore, September 26; and Gear Exp 2003, October 5-8 at the Greater Columbus (OH) Convention Center.

MORE On-line

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International Corner

ABB Promotes "Nye Inside"

ABB South Africa, a R2 billion manufacturer of electric power technologies, selected Nye's Rheolube™ 368AX-1 for a worm gear in its new 2,500-amp circuit breaker.

Corruflex, Nye's agent in South Africa, had to earn the business. ABB engineers reported that with a competitor's grease, gears showed wear scars after 1,000 cycles, which is the device's warranty. With Rheolube 368AX-1, a synthetic hydrocarbon grease designed for highly loaded gears, there were no wear scars after 1,200 cycles. Plus, this performance improvement was achieved with less grease. The worm gear uses only 100 grams of Rheolube 368AX-1, compared to 600 grams of the former grease.

Corruflex principal David Kuhn said, "One of the successes noted during a nationwide tour to launch the new circuit breaker was the smooth and effortless operation of the worm gear. The ABB engineer still receives inquiries as to what grease is being applied on the breaker." ABB now places a label on each circuit breaker that reads, "Lubricated by Nye Lubricants." MORE On-line

Grease Replaces Brushes in Patented Alternator

Prestolite Electric recently patented an improved brushless alternator whose unique design relies on an electrically conductive grease from Nye.

There are two types of alternators, brush-type and brushless. Brushes tend to wear, have a relatively short life compared to other parts of the alternator, and can produce sparks that can damage other nearby equipment. Brushless alternators overcome these disadvantages, however, they are typically less efficient in terms of AC current output, much larger in size, and more expensive.

In Prestolite's new alternator, the exciting current is supplied to the rotor through two relatively low friction ball bearing assemblies whose outer races are electrically connected to the inner races by a highly electrically conductive grease formulated by Nye — a grease that replaces alternator brushes. The alternator, which is designed for heavy duty and business class trucks, offers important commercial advantages. As explained in the patent (US 6,489,702 B1), consumers get the long-life associated with brushless alternators and the output characteristics of a brush-type alternator, which includes good output at low rpms. It also requires less space than conventional brushless alternators with the same output, and is more economical and lighter in weight — good news for OEMs. Nye worked closely with Prestolite and NTN Bearing to formulate an electrically conductive grease for the alternator.

Prestolite Electric is a global manufacturer of alternators and starter motors. NTN Bearing is a global manufacturer of bearings and constant velocity joints. MORE On-line

Non-Silicone Bushing Grease Approved by GM

General Motors assigned Part No. 9986233 to Nye's Fluorocarbon Gel 875R for stabilizer bushings. Fluorocarbon Gel 875R is a rust-inhibited, PTFE-thickened, heavy viscosity, synthetic hydrocarbon grease. Nye often recommends Fluorocarbon Gel 880, a PTFE-thickened silicone grease, for stabilizer bushings. GM wanted a non-silicone grease with the same capabilities. Stabilizer bushing grease eliminates the annoying (sometimes, down-right obscene) sound of rubber against metal that has been known to boost warranty expenses. MORE On-line

Check material compatibility when selecting a lubricant. Case in point: an EPDM O-ring for an icemaker (See photo below). A polyglycol oil was specified as an assembly aid but workers incorrectly used a polyalphaolefin (PAO) grease. The PAO-lubricated O-ring (left) swelled nearly 25%, while the polyglycol-lubricated O-ring (middle) and the control O-ring (right) remained virtually the same size after accelerated life testing.

Material and lubricant manufacturers can provide compatibility data. For critical applications, however, documentation should not replace testing at expected high and low operating temperatures. MORE On-line

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