

Nye[®] LubeLetter

Since 1844

April 2020



Lubrication



Collaboration



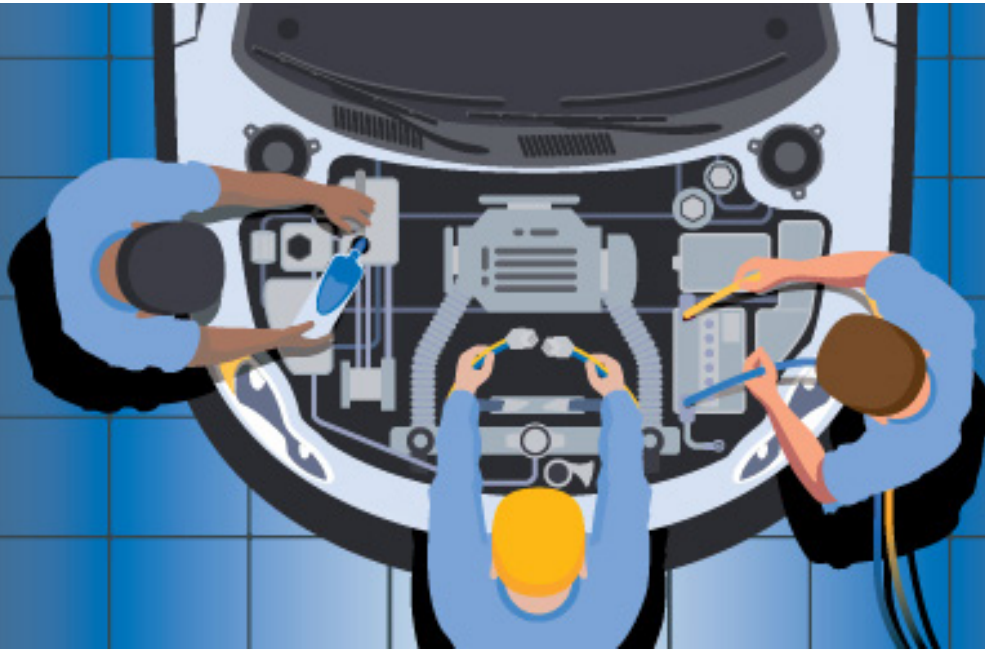
Innovation





NyoGel® 760G in Service Bulletins

When parts need to be repaired or routinely serviced, OEMs must be prepared to issue recommended products and solutions. These bulletins play an important role in ensuring that dealerships or service providers provide their customers with the right solution that will solve current issues and/or prevent future problems from occurring.



While almost all connectors work flawlessly when cars are rolling fresh off the assembly line, the true reliability of the electrical system of a car only becomes apparent after the cars are exposed to their harsh everyday operating conditions:

- Constant vibration and shock
- Extreme temperatures & humidity
- Exposure to ice melt, saltwater, dirt and dust

Over many decades, Nye has helped several prominent OEMs with their costly recall campaigns by providing a field fix for connector failures that could have been avoided by using [Nye's Connector Grease](#), NyoGel® 760G, in the initial design. NyoGel® 760G is the universal standard for dielectric grease specified by leading OEMs across many industries. The grease was engineered to improve the functionality, reliability, and longevity of electrical connectors, switches, printed circuit boards, and wire nuts.

Product	Chemistry	Temperature Range	Water Washout (1 hr @ 80°C)	Copper Corrosion (ASTM D-4048)
NyoGel® 760G	PAO / Silica	-40 to 135 °C	2%	1a, Slight Tarnish

Advantages of NyoGel® 760G

- Extends the functional life of components.
- Improves the reliability of connections.
- Seals and protects components from environmental elements.
- Prevents fretting wear and corrosion.
- Reduces insertion force.
- Insulates against electrical short circuits.
- Specified by: Ford (WSB-M1C239-A), GM (9986087, 12377900, 1645644), Chrysler (MS-9469, 04661991, 05013781AA) and others.

Easy Application

NyoGel® 760G is offered in 110-pound kegs, 7-pound pails, 30cc syringes, and 100-gram tubes to suit different dispersing needs. See our [Dispensing Brochure](#) for our list of recommended dispensing companies.

Service Bulletins

Below is a list of service bulletins where NyoGel® 760G is listed as the recommended maintenance solution for components experiencing issues related to fretting corrosion, water intrusion, and/or oxidation.

Company	Component	Mass Loss
BAE Systems	HybriDrive®	System Manual401393-397
Caterpillar Inc.	Fuel Injectors	Service Bulletin03-40-001
C. E. Niehoff & Co.	C510 Alternator	Service Bulletin 4-7
Daimler Trucks American	DEF Gauge Stuck	Service Bulletin 4-7
EATON, Roadranger	Input Shaft Sensor for Hybrid Transmissions Lightning 18-way ECU Connector	Service Bulletin TAIB0847 Service Bulletin TMIB-0156
Emerson Climate Technologies	Copeland Discus™ Compressors	Service Bulletin AE8-1368 R2
General Motors	Brake Lights and Powertrain, Braking, and Suspension Control Modules	Service Bulletin 09-06-03-004A Service Bulletin 09-06-03-004B Service Bulletin 09-06-03-004C Service Bulletin 09-06-03-004D
Harley Davidson	Emerson Climate TechnologiesDiagnostic Trouble Codes P2135 and P2101	Technical Document TT418
Hyundai	Control Wiring Harness	Service Bulletin 03-40-001
Navistar, Inc.		AC Bus Operation and Maintenance Manual: 0000001425 3915018R2 Operation and Maintenance Manual: 0000001581 2645901R5 ProStar+ Operation Manual: 0000001301 3933971R5

* These service bulletins were not issued by Nye Lubricants. Please contact the corresponding OEM for more information regarding the bulletin in question.

Contact An Engineer

**Jeffrey Wheeler –
Regional Engineering
Manager (Electric &
Autonomous Systems)**



Jeff Wheeler has been with Nye for three years as a part of our automotive team working out of the Detroit office. Within the automotive team Jeff helps customers find lubrication solutions for their electrified systems and components. Prior to working for Nye, Jeff worked as an engineer for the United States Steel Corporation. Jeff holds a Bachelor of Science degree in Chemical Engineering from Michigan State University.

[Click here](#) to contact Jeff today.



Case Study: Protecting Transistors in Medical Devices Against Moisture

Background

A medical device manufacturer approached Nye in search of a lubricant for their new transistor design. The transistors within this Saline Solution IV were located on a printed circuit board that was positioned next to a tube containing saline. The manufacturer was concerned that the coating on their PCB would not sufficiently prevent saline intrusion. Connector lubricants can act as a seal to keep dirt and moisture away from critical components. This customer needed a biocompatible lubricant that would seal the transistors and protect them from saline, water intrusion, and corrosion.

Challenge

- Can the lubricant seal the transistor to keep out saline and prevent corrosion?
- Can we provide a small dispensing option for hand-held application?

Soultion

NyeMed® 7560, 10cc Syringe
A medium viscosity, UV-dyed, synthetic hydrocarbon grease

- Provides an environmental seal to protect against moisture and oxidation
- Biocompatible against three ISO 10993 standards
- Does not swell most plastics and elastomers
- Specifications: GM: 9985880



Product	Temperture Range	Oil Separation (24 hrs @ 100°C)	Evaporation (24 hrs @ 150°C)	Cytotoxicity L929 Agar Diffusion (Direct Contact)
NyeMed®	-40 to 120 °C	1.5%	0.3%	Grade 0 No Cellular Reactivity

Results

Given the customer’s operating conditions, Nye provided a sample of NyeMed® 7560, a biocompatible lubricant with proven success in cable and connector applications. The customer conducted stringent validation testing which included immersing the lubricant in saline. NyeMed® 7560 passed these tests, proving that our lubricant prevented corrosion, did not interfere with electric signals, and was compatible with PCB materials. The customer implemented NyeMed® 7560 in their design and remains satisfied with its performance.



Meet The Author

Alex Balan - Regional Engineering Manager

Alex Balan has been with Nye for 5 years and helps our customers in the Midwestern United States find the right lubrication solution for their application. Before coming to Nye, Alex worked for several prominent specialty coating manufacturers in both technical and sales capacities. Alex holds a Master’s degree in Chemical Engineering with a focus on Macromolecular Technology.

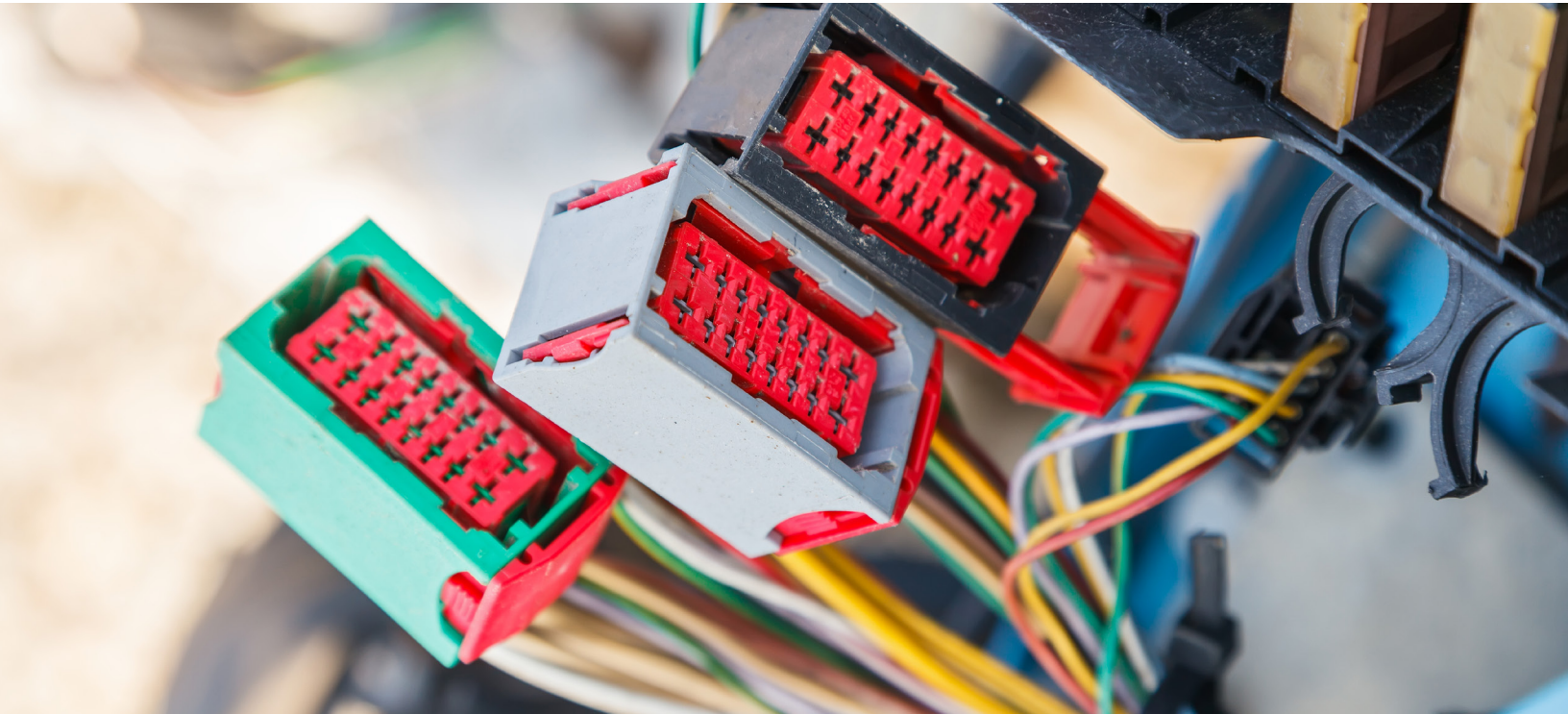
[Click here](#) to contact Alan Balan today.



Sulfur and Connector Grease – What You Need to Know

One of the most common questions we get about our connector grease is if it contains sulfur. Engineers are concerned that a grease that contains sulfur, in any form, will interact with terminal metal plating materials, posing a risk to continuity. The short answer is yes, our connector greases contain inactive sulfur. But there is a difference between inactive and active sulfur molecules and their effect on connector applications.

Inactive sulfur is **not harmful** to connector applications. But first, let's explore why sulfur is used in the first place.



Why is Sulfur Used in Grease?

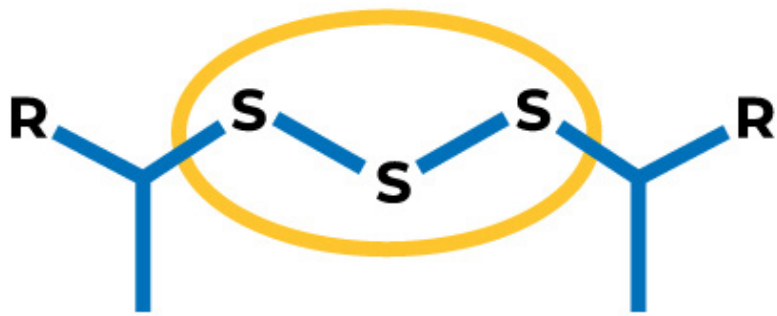
Sulfur is found in many anti-wear, extreme pressure, and antioxidant additives that enable applications to perform under extreme conditions. Sulfur additives have been known to reduce wear on metal surfaces and prevent the metal surfaces from welding together.

How Does Sulfur Affect Connectors?

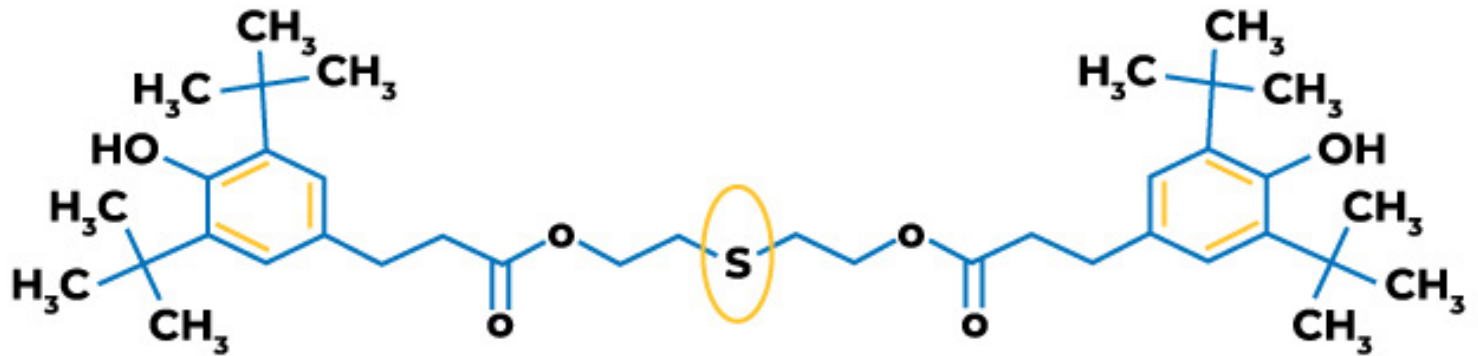
Most connectors are coated with a thin layer of a conductive metal like silver, tin, or copper-tin. These are all reactive metals. Active sulfur, when applied to a connector, reacts with the thin metal coating and creates metal sulfides, or tarnish. When these sulfides build up, they will flake off the surface of the connector and disrupt the surface morphology.

What is the Difference Between In-Active and Active Sulfur?

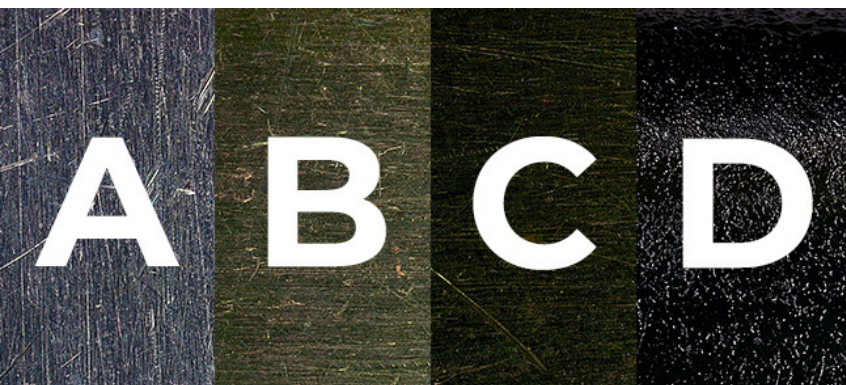
Not all sulfur is harmful to electric connectors. Active sulfur is harmful to connectors and can result in a loss of continuity, whereas inactive sulfur is not harmful.



Molecules containing active sulfur contain chains of two or more sulfur atoms in length. When sulfur molecules are connected to other sulfur molecules it creates a short chemical chain that can break easily. This break in the chain can result in those molecules interacting with other species. In other words, the chemical structure of active sulfur makes it a reactive material that attacks conductive metal coatings.



In inactive sulfur compounds, molecules contain fewer than two sulfur atoms in length. In the example shown above, sulfur is connected to carbon or oxygen, which creates a tight chemical structure. Because the structure is so tight, the sulfur molecules do not break off the chain. Thus, they cannot react with the conductive metal coating on the connector surface to create tarnish.



Nye chemists ran a series of tests to illustrate the effects of inactive and active sulfur.

Image A shows an untreated silver-plated coupon. The coupon seen in Image B was covered with grease containing inactive sulfur and heated at 100°C for 4 weeks. In this image you can see that the grease protects the coupon surface without creating tarnish.

In Image C, the coupon was coated in a modified grease that does not contain any sulfur and was subjected to the treatment described above. The coupon coated in grease without any sulfur does not tarnish the coupon but is also not protected by the inactive sulfur containing additives which prevent the metal from oxidizing.

Lastly, in Image D a coupon was treated with another modified grease, this time containing active sulfur. The coupon containing active sulfur completely tarnishes the metal surface in just one week and created sulfides that eventually flaked off the metal surface.

These results prove that not only is inactive sulfur safer to use than active sulfur, but inactive sulfur additives improve the overall performance of your connector when compared to a grease without sulfur.

Why is Sulfur Used in Grease?

Not all sulfur is bad for electric connectors! Additives containing inactive sulfur protect components against wear and oxidation without tarnishing conductive metal coatings.

To learn more about the benefits of connector grease, [click here](#).



Meet the Author

Dr. Amanda Walcott Stubbs – Tribologist

Amanda is the newest addition to Nye's research and development team. Amanda recently graduated from the Massachusetts Institute of Technology with a PhD in Inorganic Chemistry. At Nye Amanda's research will dive into how grease affects the metal surface at a chemical level to help us formulate products that meet our customer's needs.



Myths and Facts on Connector Lubrication

Wondering if you need grease for electrical contacts and connectors? Watch our video newest to uncover 6 facts and myths that will help make your design decision easier.

Click here to watch our video: <https://www.youtube.com/watch?v=UsQZdZv4e90>



Meet Nye - Scott Munday

Scott Munday has worked at Nye for the last 12 years. As an integral part of our sales team, Scott works with engineers in the Electronics, Appliance and Power Tools markets to find lubrication solutions that solve their design challenges. Scott holds a Bachelor of Science in Business Administration from Gardner-Webb University



Scott Munday

Regional
Engineering Manager

◆ What is one of the most common questions you get about connector grease?

The most common question I get revolves around the misconception that a conductive grease should be used to solve electrical intermittency issues. This then leads to a discussion about dielectric connector greases and the benefits that these greases provide to prevent fretting and corrosion.

◆ Why is it important that suppliers spec in a connector grease during the design phase of their project?

The importance of having the appropriate Nye connector grease spec'd into a connector application during the design phase is to ensure the best solution is incorporated to meet the design and operational parameters of the connector. The design phase will also allow for the testing of a couple of different lubricant options to see how they will perform in the design and under expected operating conditions. Another reason this is important is that the appropriate connector lubricant can reduce warranty claims due to electrical intermittencies in connectors once the product design enters the marketplace.

◆ **Wiring harness assemblies include dozens of connectors some of which that are very large. Why should connector grease be used in these applications?**

As larger and/or higher density connector assemblies become more and more common in all types of electrical applications, the primary concern here is the amount of force required to join the connectors together – commonly referred to as mating force. In addition to larger and higher density connector assemblies, sometimes connector housings can be mounted in hard to reach areas. Compounded with high mating force requirements, this scenario can lead to real ergonomic challenges and the possibility that the connectors are not mated correctly. Nye’s connector grease is designed to reduce the force needed to mate connectors and ensure solid connections.

◆ **Where and why is connector grease used in power tool applications?**

There is no doubt that battery powered tools provide a tremendous convenience to professional contractors and DIYers alike. The challenge with electrical connectors in these tools revolves more around the wear of removing and replacing the battery, as well as, corrosion from being used in outdoor and construction environments.

A connector grease on the contacts in the tools helps to reduce wear and keep out dust and moisture from the job site and home projects. By keeping dust and moisture away from the connectors, the reliability and durability of the tool is greatly increased.

◆ **What is your favorite thing about working for Nye?**

My favorite thing about working at Nye is the interaction with both existing and new customers and providing innovative solutions to their lubricant challenges.

[Click here](#) to contact Scott.



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more updates
next month!**

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