



# MEDICAL DEVICE & EQUIPMENT LUBRICATION

Innovative solutions and enabling technologies, for a broad range of applications, from drug delivery devices to electrical connectors, optics and robotics.



# PRODUCTS FOR MEDICAL APPLICATIONS

LUBRICATION, SEALING, SURFACE PROTECTION & MOTION CONTROL



## Enhancing Value & Enabling Innovation

Carefully selected lubricants do much more than reduce friction and wear-rate between surfaces in device and equipment mechanisms. They can broaden a product's operating temperature range, reduce unwanted noise, control motion, improve touch-sensitivity and user perception, reduce variability and limit design or production costs by reducing the need for extremely tight dimensional tolerances. In short, **lubricants are critical design sub-components that add value to, or enable, breakthrough medical technology.**

Nye is your product development partner that offers:

- A broad selection of products formulated from multiple synthetic material classes, for flexibility and material compatibility
- Formulations specifically developed for MedTech
- Global collaboration with designers and their partners in complete confidence
- Custom formulation and testing
- Concept to post-production support
- Clean production areas, including an ISO 14644-1 Class 7 Cleanroom
- Specialty packaging

To help customers select the right product, Nye developed the NyeMed® Series of products based on diverse material classes. **Non-hazardous and proven to be biocompatible, NyeMed® products are designed, developed, and qualified utilizing a risk-based quality approach, with Design and Record Controls.** We offer additional services which can include the creation of limit samples, special characterization, and toxicological testing.

## Motion Control & Sealing

In medical equipment, viscous damping greases or gels can smooth operation, eliminate noise, and reduce the impact of environmental factors, e.g. by sealing gaps and orifices. These products provide appropriate viscous drag on parts while moving. This stress resistance controls motion and minimizes free-motion problems, such as backlash, stick-slip, or coasting. Products with appropriate rheological characteristics can be selected, or formulations can be tailored to the requirements of the application.

A special class of medical applications that utilize viscous damping gels involves the development of disposable and reusable devices such as: pumps, hand-held injectors or inhalers, for drug or implant delivery. These devices rely on our products to lubricate parts, absorb shock, control dose delivery rate, and ensure complete dose delivery while optimizing the feel and sound of the device. The result is enhancement of functionality, quality, and usability, thus leading to higher patient compliance, lower risk, and better treatment outcomes.

NyeMed® damping products share important physical characteristics: carefully controlled flow properties; low oil separation, and good compatibility with plastics. These products serve as a starting point for custom-design of experimental formulations for specific customer applications.

## Electrical Connectors, Contacts & Switches

Microelectronics are proliferating in medical devices, requiring increasing numbers of connectors and contacts. The benefits of lubricating electrical connectors and switches in medical devices include:

- Providing protection against sterilizing conditions, dust, reagents, moisture, and corrosive substances
- Reducing friction and wear
- Lowering insertion force

## Engineered Solutions for MedTech

### Robotics & Automation

This application class encompasses a broad range of mechanisms. Some will benefit from the use of our NyeMed® product line, while others will meet design requirements with our standard Nye products that have a proven record of success in automated equipment utilized in the Aerospace, Semiconductor and In-Vacuum industries.

- **Bearings:** Wide range of lubricants offered, from impregnating oils for sintered bearings to ultrafiltered greases for rolling element bearings. Greases can provide the elastohydrodynamic lubricating film needed to reduce friction and wear, while also serving as an effective seal to protect from contaminants and moisture.
- **Gear Motors & Gear Boxes:** Gear lubricants meet broad temperature requirements without oxidizing or evaporating. Lubricants minimize friction, inhibit wear and corrosion, dampen noise and control free motion.
- **Linear Positioning Devices & Sliding Parts:** Mechanisms require lubricants that exhibit stay-in-place properties, while minimizing friction, inhibiting wear, rust, and corrosion, damping noise, and controlling free motion.
- **Lead Screws & Ball Screws:** Lubricants reduce torque, increase efficiency, and extend performance life.

**A wide variety of Nye products from the NyeMed®, NyoGel®, Rheolube® and Uniflor™ product lines are available for use in equipment and devices. Please contact Nye to discuss your application.**

### NyeMed® Product Line



Nye Products	Type	Characteristics
NyeMed® 7325	Silicone	UV-dyed, high-viscosity gel or grease with a narrow viscosity specification.
NyeMed® 7364	Synthetic Hydrocarbon	Extremely stiff, tacky, very high viscosity gel or grease.
NyeMed® 7560	Synthetic Hydrocarbon	UV-dyed, medium-viscosity, clear gel or grease. Applications range from mild damping to protection of electrical contacts and connectors.
NyeMed® 7492	Ester	UV-dyed, low-viscosity gel or grease with high affinity for metal surfaces. Typical applications might include high-speed bearings, switches, etc.
NyeMed® 7630	Synthetic Hydrocarbon	Medium viscosity gel or grease that excels at high-speed and high-temperature applications, providing corrosion and wear protection
NyeMed® 7571	Perfluoropolyether	Medium viscosity gel or grease with high oxidative stability and lubricity, providing environmental protection for both plastic and metal substrates.
NyeMed® 7471	Perfluoropolyether	Inert fluid possessing a very wide temperature range (-70 to 250 °C), excellent oxidation resistance, high plastic/elastomer compatibility, and low solubility.
NyeMed® 7477	Perfluoropolyether	Medium viscosity inert gel or grease possessing a very wide temperature range (-70 to 250 °C), excellent oxidation resistance, high plastic/elastomer compatibility, and low solubility.



## Optics

In medical device applications, Nye's optical coupling (index matching) gels and fluids find value in laser treatment systems, blood glucometry and other applications where light absorption or sensitivity is measured. When applied between two solid materials, such as transparent plastics and glasses, they minimize internal reflection of light by matching the refractive index of the mating materials, thereby optimizing light transmission.

Characteristics of Nye's clear optical gels and fluids:

- Exhibit stable index of refraction
- Exhibit low outgassing and volatility
- Free from light-absorbing microscopic particulates
- Chemically stable and non-toxic
- Designed for reliability and long service life

Nye Products	Refractive Index	Type	Characteristics
SmartGel OC-431A-LVP	1.46	Thixotropic Gel	Ready-to-use, non-migrating, viscoelastic silicone with a high apparent viscosity
SmartGel OCF-463	1.63	Optical Fluid	Clear, hydrocarbon-based optical fluid with high refractive index

## Dental Handpieces

For high speed and precision bearings in dental handpiece equipment, Nye offers DHL 600. This NSF H1 registered oil, tested to 150°C, are specified by OEMs and sold under private labeling to dental practices.

## Potable Water

Nye has two products (880-FG & 885-FG) that have received NSF/ANSI 61, WRAS (UK), and ACS (FR) certification for use in drinking water applications.

Additional oils, fluids, greases, and dispersions are available to meet a wide range of application requirements in the medical industry. For technical specifications, evaluation samples, questions about any Nye products, or to discuss a lubricant custom-designed for your application — contact a Nye engineer.

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