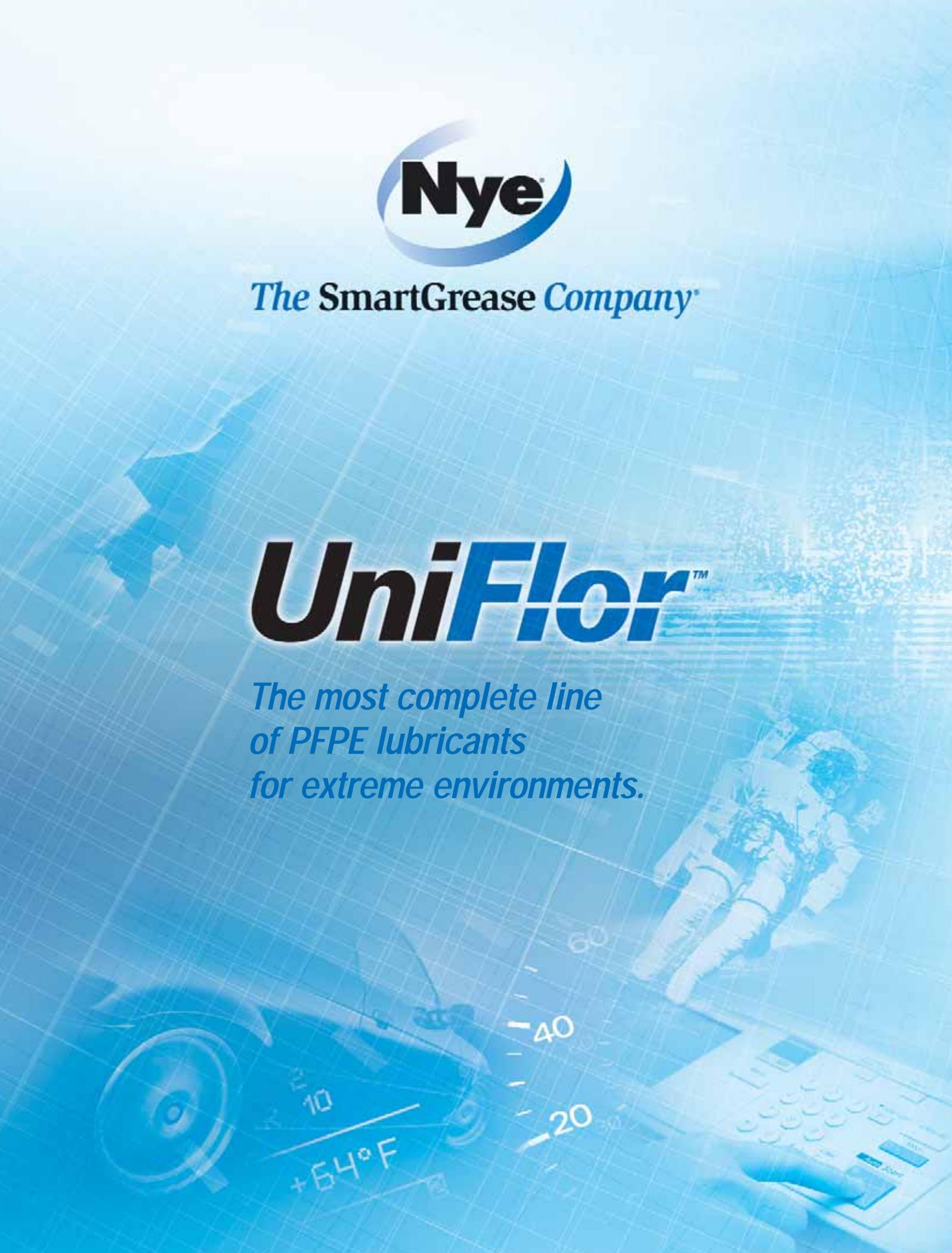




The SmartGrease Company

UniFlor™

*The most complete line
of PFPE lubricants
for extreme environments.*



UniFlor™

Engineered for Extremes

UniFlor perfluoropolyether (PFPE) lubricants are designed for applications that require wide temperature service up to 250°C, low volatility, oxygen compatibility, fuel and chemical resistance, non-flammability, or superior compatibility with plastics and elastomers.

A unique family of PFPE oils and greases. While all PFPEs are composed of carbon, fluorine, and oxygen, the molecular structure of each PFPE fluid varies depending on the base materials and polymerization processes used by PFPE manufacturers. These structural differences have an effect on the fluid's pour point, volatility, viscosity, and Viscosity Index — all critical factors in lubricant formulation. Some PFPE oils, for example, have a pour point of only -20°C, while others offer pour points as low as -90°C. Similarly, some PFPE oils offer better wear resistance and vapor pressure properties than others. Unlike any other brand of fluorinated lubricants, the UniFlor family incorporates every available PFPE oil — a distinct advantage for the design engineer. UniFlor is the only family of PFPE lubricants that can ensure you get the PFPE lubricant that best matches the operating conditions of your product.

Formulated for Specific Applications. Each UniFlor oil and grease is custom-designed for your application. You'll find economical UniFlor formulations for gears, slides and bearings. Another UniFlor series is engineered for high-speed, high-temperature bearings. Wide-temperature, ultra-viscous UniFlor greases are available for heavy-duty industrial bearings. These products also serve as sealants for vacuum applications. Some UniFlor oils and greases combine wide-temperature, high-load capability and ultra-low volatility for metal-on-metal applications. Still other formulations are designed for delicate precision instruments, sensors, potentiometers and actuators where ultra-low temperature and low starting torque are critical design parameters. UniFlor is never a one-size-fits-all solution. Combining the right PFPE fluid – or blend of fluids – with appropriate thickeners and proprietary additives means you get the best PFPE lubricant for your application.

UniFlor. Another member of Nye's SmartGrease™ family of synthetic lubricants. It knows how you want your product to perform.

The Expanding UniFlor Universe

In 1966 W. H. Gumprecht published "A New Class of High-Temperature Fluids," a paper that introduced the first perfluoropolyether (PFPE) fluid to the world of lubrication. By the late 1960s, Nye Lubricants became one of the first companies to formulate and commercialize its own PFPE oils and greases, known today as UniFlor™.

Early UniFlor applications included oxygen service valves and military ordnance fusing. Working with NASA led to UniFlor's use in oxygen sensors in astronaut space suits. Soon, UniFlor found many applications in the aerospace industry, from fighter jets to satellites.

Gradually, the advantages of UniFlor chemistry solved a broad range of challenging lubricant problems. UniFlor entered the automotive world on throttle position sensors, components subjected to fuel vapors and temperatures of 150°C. Soon after, it was specified for exhaust gas recirculation sensors that required lubricant integrity at 200°C. Today, UniFlor is specified for anti-lock braking systems, idle air actuators, fuel sensors, separable electrical connectors, multifunction switches — and other automotive applications where exposure to high heat, fuel, automotive fluids and a wide range of plastics, elastomers and metals require highly stable, non-reactive lubricants.

UniFlor then found a home in industrial maintenance, especially in heavy duty bearings subjected to high heat and other extreme environments. UniFlor's thermo-oxidative stability extended lubrication intervals, decreased downtime, and reduced maintenance. Food-grade UniFlor products have also been introduced to commercial bakeries that need long-life, odorless NSF-registered lubricants for chains and other mechanical devices, such as those in ovens that continually cycle baked goods.

In 21st century, UniFlor began improving the life cycles and functionality of consumer products. Inert, plastic-compatible UniFlor is the choice of leading manufacturers of cell phones and computer printers, where it reduces wear without cracking, crazing or degrading even the most economical plastics.

For over 40 years UniFlor lubricants have improved performance, lengthened life cycles, cut design costs and survived extreme environments. Call Nye to find out how UniFlor may solve your design challenge.

How Design Engineers Are Using Nye's L



Electrical Connectors

Multi-pin separable automotive connectors often require significant mating force. By reducing insertion force, UniFlor mitigates the risk of repetitive strain injury for assembly workers. UniFlor also meets USCAR insertion force and circuit resistance standards, survives high temperatures, and prevents contact wear, corrosion and fretting.



Automotive Sensors

Electromechanical sensors need unimpeded contact because they signal the driver and critical automotive control systems. A thin coating of UniFlor on throttle and fuel sensors reduces wear, ensures good contact in high and low temperatures, and remains inert in the presence of fuel and automotive fluids.



Printers and Copiers

Fuser roll bearings in laser printers and copiers see temperatures of 200°C and above. While high heat provides near instant image fixing, it can also destroy a lubricant. An economical UniFlor lubricant withstands the heat and is compatible with the wide range of plastics used in gearing and shells.



EGR Valves

An "EGR valve" is the main emissions control component in an Exhaust Gas Recirculation system. Located on or near the engine, it is exposed to extreme temperatures and exhaust fumes. UniFlor provides durable wear protection to extend EGR service into the 100,000 mile range.



Multi-Function Switches

UniFlor prevents wear and corrosion of high-temperature switch contacts — without increasing circuit resistance. It also minimizes fretting corrosion caused by normal vibration during travel.

Anti-lock Brakes

Bearings, pistons and lead screws in anti-lock braking systems require a lubricant that can withstand high temperatures and exposure to brake fluid. At the same time, the lubricant must be compatible with EPDM rubber seals and o-rings. UniFlor successfully address all three concerns and is widely used for electronic and hydraulic brakes and traction control systems.



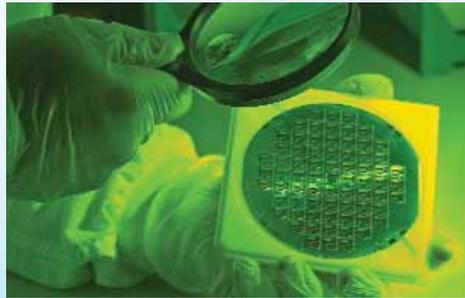
Cell Phones

In flip cell phone designs, perceived quality often hinges on a plastic hinge. OEMs and contract manufacturers use UniFlor to make the flip action smooth and silent over a long life cycle. UniFlor also eliminates compatibility issues. It won't crack, craze or degrade plastic parts.

Satellite Bearings

Satellites pivot, turn and twist to maintain flight paths and keep globe spanning communication systems linked. A variety of bearings are required to provide the right orbital motion. UniFlor is specified because it won't vaporize in the high vacuum of space or outgas materials that could contaminate sensitive instruments.

UniFlor Lubricants



Semiconductor Manufacturing

The highly sensitive process of manufacturing semiconductor wafers demands a clean, vacuum environment. Robotic arms, platforms, and linear slides used in vacuum chambers need a lubricant with low volatility — to ensure long component life and curtail outgassing, which can contaminate chips. UniFlor has exceptionally low vapor pressure and provides life-extending lubrication for semicon equipment.



Disk Drives

Computer disk drives require lubricants with low viscosity and low volatility. Their shrinking size and faster speeds demand a resilient lubricant even under boundary lubrication conditions. A custom formulated UniFlor — with its high temperature tolerance and high viscosity index — helps ensure drive reliability.



Food Production Equipment

Nye's food-grade UniFlor lubricants are NSF-registered. They are suitable for long lasting wear protection on commercial bakery equipment. Nontoxic and odorless, they meet the Nonfood Compound H-1 guidelines for incidental contact and conform to the Food and Drug Administration's CFR Title 21.



Space Suits

UniFlor lubricates oxygen valve bearings in space suits. The valves, which regulate oxygen flow, demand a lubricant that is highly inert so it won't react with oxygen, while ensuring prolonged use in the vacuum of space.



Jet Engine Actuators

UniFlor is specified for F-15 and F-16 jet engine thrust actuators. Thrust vectoring allows jets to direct engine power for maximum maneuverability, short take-offs and landings. The actuator physically redirects jet propulsion, requiring a lubricant that survives the engine's hot exhaust.



Oven Locks

Oven locks, which automatically lock oven doors when temperatures reach 232°C (450°F), use thermoplastic gears. UniFlor delivers the high-temperature tolerance, material compatibility and wear protection that extends oven lock life well beyond warranty requirements.

Singlefacer Roll Bearings

Singlefacer rolls press flutes into corrugated paperboard. Operating in an environment of heat, steam and chemicals, the heated roll bearings see continuous temperatures well above 200°C. A UniFlor grease developed for singlefacers ensures the bearing lasts the life of the roll. It also speeds changeovers, reduces downtime and lengthens lubrication service intervals.

Find Out How You Can Use Nye UniFlor

Call Nye at 1.508.996.6721 for help in selecting a UniFlor lubricant that will improve the performance of your next design. To locate the Nye engineering office nearest you, log on to SmartGrease.com.



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ISO 9001:2000
ISO/TS-16949



ISO 14001

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