

THE WORLD LEADER
in Synthetic Lubricants



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U N I F L O R™
Performance To The Limit

In addition to UniFlor™ brand lubricants,
Nye Lubricants, Inc., stocks all commercially available
synthetic oils and several proprietary synthetic fluids.
For any custom-formulated synthetic oil and grease,
Nye is the source.

There's a **NEW DESIGN**
ENGINEERING CREDOemerging.

It has to last longer, much longer. Warranties drive sales.

It has to take the heat and the cold. Extreme is the way of the future.

It has to be strong, tightly engineered.

It has to be quiet, velvet-smooth, sleek, clean.

It has to be tough, work in harsh environments.

It has to be done yesterday.

With performance standards like these, you need to know about UniFlor™. It's a unique family of fluorinated oils, greases, and sealants – exclusively by Nye Lubricants, Inc. It's designed to take performance to the limit, whatever limit you choose to set.



ADDING LIFE

to Your Design

automotive components

oxygen sensors

EGR sensors

ABS mechanisms

multifunction switches

electric switches

door latches

paperboard manufacturing

industrial bearings

Most moving parts need a lubricant to prevent wear and extend operating life. Since high-quality components are often lubricated for life – or minimally, to achieve extended lubrication intervals, the thermooxidative stability of the lubricant is critical. Excessive evaporation or oxidation spells failure.

With UniFlor, thermooxidative stability is assured. The most stable of all lubricants, UniFlor consistently outlasts petroleum and other synthetic lubricants in rigorous laboratory tests. In the field, it performs just as well.

UniFlor lubricants are specified for dozens of automotive components – oxygen and EGR sensors,

ABS mechanisms, multifunction switches, to name a few – to ensure

10-year, 150,000-mile performance. UniFlor extends the

operating life of switches in professional hair dryers

and ensures long life and trouble-free operation for

door latches on commercial ovens. In paperboard

manufacturing plants, the UniFlor product family is

extending lubricant intervals for high-temperature,

industrial bearings from once a day or less, to once a

week or longer – while it eliminates safety hazards,

speeds change-overs, and reduces unplanned

downtime.

Whether you need a long-life com-

ponent to survive in a competitive marketplace

or you want to gain a competitive advantage by

being the first to introduce a longer-life product

in your industry, think UniFlor. It's the lubricant

made to add life to your design.



Thermogravimetric Analysis (TGA)
for UniFlor Oils versus Standard Hydrocarbon Oils



TGA is an excellent method for measuring the thermooxidative stability of oil. This graph illustrates weight loss as a function of temperature.

Temperature Range °C

-100 -80 -60 -40 -20 0 20 40 60 80 100 120 140 160 180 200 220 240 260

Polyglycols

Synthetic Hydrocarbons

Synthetic Esters

Silicones

UNIFLOR™
Performance To The Limit

You not only have to design for long life, you often have to design for long life at extreme temperatures. And the trend seems to be more of the same. Highly engineered devices in many industries are getting smaller, faster, and hotter – operating environments where UniFlor shines.

No other family of lubricants matches UniFlor's operating temperature range. Many UniFlor products withstand continuous high temperatures of 250°C – and even higher spikes. In the cold zone, unique UniFlor formulations stay fluid and lubricious at -90°C.

More than its ability to lubricate at extreme temperatures, UniFlor's broad temperature capability can deliver some not-so-apparent advantages. In an automotive dimmer switch, UniFlor reduces costs by eliminating the need for a heat sink or a fan. Because UniFlor cannot varnish at high temperatures, it eliminates the hours spent chipping off baked-on lubricants from the shafts of high-temperature industrial bearings during change-overs. In one extremely delicate application, a custom-formulated UniFlor lubricant survives rapid temperature cycling from -40°C to 150°C – a competitive advantage that the component manufacturer considers a trade secret.

Specified for jet engine and satellite components, UniFlor oils and greases are sure to meet your most challenging terrestrial temperature requirements.



- jet engine components
- automotive - underhood
- commercial ovens
- high-temperature bearings
- satellite components
- professional hair dryers
- appliances
- snowmobiles

Challenging

TEMPERATURE LIMITS



UniFlor base oils are inert – which is excellent news for design and production engineers concerned about lubricant- material compatibility.

Water-white oils and smooth white grease, UniFlor lubricants do not crack, craze, discolor, or dissolve plastics. They do

not cause natural rubber or elastomers to swell, shrink, or become brittle. And they have no adverse effect on metals. In fact, their low surface tension and broad temperature capability enable them to wet and lubricate clean metal surfaces effectively under a wide range of operating conditions and loads.

UniFlor can be used with confidence on automotive assembly lines to improve the tactile and acoustic qualities of moveable plastic parts in the passenger compartment. On weather-stripping it eliminates squeaking dry rubber. It can dissipate heat and reduce noise in high-speed or loaded plastic gears. Unlike petroleum lubricants, it's safe on EPDM rubber and can be spread onto gaskets, O-rings, and seals to ensure a tight barrier against water, salt-water, or aggressive chemicals. Use it on plastic control knobs, electric switch mechanicals, plastic hinges...and in hundreds of other applications – without the time and expense of prequalification and life-cycle testing.

UniFlor is the lubricant of choice when you don't want to worry about material compatibility today – or ten years down the road.



- moveable plastic parts
- weather-stripping
- high-speed plastic gears
- loaded plastic gears
- EPDM rubber
- gaskets
- O-rings
- seals
- plastic control knobs
- electric switch mechanicals
- plastic hinges

Taking the worry out of
MATERIAL COMPATIBILITY

Surviving HARSH CHEMICALS AND FLUIDS



UniFlor is the ideal candidate for a broad range of applications where lubricants must function in harsh operating environments. A fully fluorinated, non-toxic, ozone-safe material, it is unaffected by sulfuric acid, hydrochloric acid, alkalis, halogens, and petroleum solvents. Importantly, UniFlor is also nonflammable. It does not react with oxygen – even at 300 °C under 500 psi of pure oxygen.

UniFlor is an excellent lubricant and sealant for high pressure valves and valve stems, including those used in oxygen service, chemical processing, pulp manufacturing, natural gas delivery, and nuclear power plants. Because UniFlor resists gasoline, engine oil, brake and transmission fluids, it has become an important part of critical automotive components, including antilock braking systems, fuel sensors, and underhood sensors and bearings. In the telecommunications industry, it lubricates DIP switches because of its unique ability to survive solvent baths. UniFlor base oils are also specified by NASA for a variety of aerospace applications, which demand inertness to fuels and oxidants.

For mechanical and electromechanical devices in severe environments, no other lubricant, no other sealant, performs better or survives longer than UniFlor.

pressure valves
valve stems
oxygen service
chemical processing
pulp manufacturing
natural gas delivery
nuclear power plants
antilock braking systems
fuel sensors
underhood sensors
bearings
aerospace applications



Going to the extreme: LUBRICATING IN CLEAN ROOMS

highly engineered
ball and lead screws

slides

shafts

bearings

robotic devices

trolley tracks

HVAC actuators

motors

UniFlor has a successful track record in the aerospace industry, where many devices must operate for prolonged periods in the vacuum of space. In man-made vacuums and clean room environments, UniFlor performs equally well.

UniFlor can be used for highly engineered ball and lead screws, slides, shafts, bearings, such as those found in robotic devices, trolley tracks, HVAC actuators and motors. It reduces wear and extends the operating life of practically any mechanical and electromechanical part.



Why UniFlor? In addition to excellent lubricity, UniFlor offers consistently low outgassing

and low volatility which are essential for lubricants used in a clean room. Outgassing and volatility deplete the lubricant and become a source of contaminants that can disrupt nearby sensors and optics, or jeopardize sensitive products like semiconductor wafers. For lubricating larger, exposed surface areas in a Class 1000 or cleaner room, UniFlor oils and greases can be ultrafiltered. By removing microscopic particulates from the lubricant, ultrafiltration is the ultimate safeguard against lubricant-related contamination.

While long life, broad temperature excursions, material compatibility, and harsh environments challenge any lubricant, a moveable part inside a vacuum or clean room pushes the lubricant to yet another extreme. Even there, UniFlor oils and greases perform.



Vapor Pressure - torr, 25 °C
(Logarithmic Scale)

UniFlor is a family of perfluoropolyether (PFPE) oils and greases, formulated exclusively by Nye Lubricants.

Chemically, PFPEs are polymers composed of carbon, fluorine, and oxygen. Tribologically, they're ahead of their time: fluid and lubricious at -90 °C,

thermooxidatively stable at 250 °C,

nonflammable, non-toxic, chemically inert, compatible with most any design material, soft-white and buttery in appearance – and perfect for long service life.

UniFlor, however, takes you one step further.

Today, several chemical companies around the world synthesize PFPE oils. While all PFPE oils share similar characteristics – high-temperature capability and materials compatibility, for example – structurally each is slightly different, the result of different base materials and polymerization processes. Each PFPE oil has a different pour point, low temperature capability, volatility, viscosity, Viscosity Index, vapor pressure, and wear-prevention ability – all critical considerations in the field of lubrication. Unlike any other line of fluorinated lubricants, the UniFlor family includes every type of PFPE oil – which means design engineers now can get

from a single source the PFPE lubricants that best match the needs of their individual applications.

With UniFlor, it's never one-size-fits-all. It's a careful matching or blending of the right PFPE oils and additives to ensure a perfect fit between the lubricant and your application. That's clearly

a UniFlor advantage.



8100

- economical, multi-purpose
- low evaporation
- plastic/elastomer compatible

8900

- ultra-wide temperature for precision instruments
- very high viscosity index
- very low vapor pressure

8500

- for high-speed bearings
- wide temperatures
- low evaporation

8600

- economical for industrial bearings and seals
- low evaporation

8700

- excellent metal-on-metal capabilities
- low evaporation
- high viscosity index
- low vapor pressure

Unlike any other line of fluorinated lubricants, the UniFlor family includes every type of PFPE oil, which means design engineers now can get from a single source the PFPE lubricants that best match the needs of their individual applications.

The
UNIFLOR ADVANTAGE

PERFORMANCE^{to} THE LIMIT

UniFlor[™] is the new brand name, but Nye's perfluoropolyether (PFPE) product line is hardly new. It consists of a growing family of more than 75 tested and field-proven lubricants that Nye has custom-formulated – long-life oils and greases for gears, slides, ball and lead screws, rolling element and powdered metal bearings, control cables, switches, connectors, sensors, and potentiometers.

In fact, UniFlor represents what Nye has been doing best for more than 150 years – working with specialty fluids to formulate high-performance lubricants for specific applications. Today, we stock every commercially available synthetic fluid, several proprietary fluids not available elsewhere – and each of the world's PFPE fluids.

More than quality and selection, Nye offers unsurpassed, hands-on experience. Nye works with design engineers in every major industry, including automotive, aerospace, appliance, aviation, electronics, electric motor vehicles, medical instrumentation, paperboard manufacturing, power tools, recreational equipment, and telecommunications. And we support their need for custom lubricants with evaluation sampling, pre-qualification testing, and ongoing R&D in one of the best equipped lubricant engineering laboratories in the world.

Call Nye to discuss how UniFlor can meet your lubricant needs. See how UniFlor can help you take performance to the limit.



UNIFLOR™ – THE WORLD'S MOST COMPREHENSIVE LINE OF FLUORINATED OILS AND GREASES

(partial listing)

UniFlor 8100 Series

Multipurpose, economical lubricants for gears, slides, and light - duty bearings, especially when wider temperature and plastic and elastomer compatibility is required.

	Prod. Number	Temp. Range °C	Base Oil Viscosity @40°C (cSt)	Pour Point °C	Viscosity Index	Vapor Pressure Torr@25 °C ^(a)
Grease	8132	-50 to 175	60	-54	119	10 ⁻⁷
	8132R	-50 to 175	60	-54	119	10 ⁻⁷
	8172	-35 to 225	167	-35	120	10 ⁻⁸
	8172R	-35 to 225	167	-35	120	10 ⁻⁸
	8182	-25 to 225	255	-29	132	10 ⁻⁸
	8182R	-25 to 225	255	-29	132	10 ⁻⁸
	8192	-20 to 250	400	-28	150	10 ⁻⁹
	8192R	-20 to 250	400	-28	150	10 ⁻⁹
Oil	8110	-54 to 125	25	-56	105	10 ⁻⁵
	8120	-50 to 150	31	-54	96	10 ⁻⁶
	8130	-50 to 175	60	-54	119	10 ⁻⁷
	8140	-45 to 200	70	-49	112	10 ⁻⁸
	8160	-45 to 200	100	-49	122	10 ⁻⁸
	8170	-35 to 225	167	-35	120	10 ⁻⁸
	8180	-25 to 225	255	-29	132	10 ⁻⁸
	8190	-20 to 250	400	-28	150	10 ⁻⁹

Explore the World of UniFlor™

All fluorinated lubricants are not the same. While each offers excellent compatibility with plastics and elastomers, there can be wide variations in temperature capabilities, viscosity, Viscosity Index, vapor pressure, and wear prevention characteristics. That's why you need a broad selection of fluorinated lubricants – one that includes all types of perfluoropolyether (PFPE) oils – to ensure you get the lubricant that's best for your application. That's why you need UniFlor.

UniFlor is the most complete family of fluorinated oils and greases available today. And it's growing. Nye specializes in custom formulating lubricants for specific components and operating environments. So if we don't have the best fluorinated lubricant for your application today, we'll work with you to design it.

Explore the UniFlor product family. It's divided into five different series – each for a specific type of application or environment.

Call Nye today at 508 - 996 - 6721.

We look forward to being your guide into the world of fluorinated lubricants.

It's called UniFlor.

UniFlor 8500 Series

High-speed, high temperature bearing lubricants that perform exceptionally in low-temperature, low-starting torque applications.

	Prod. Number	Temp. Range °C	Base Oil Viscosity @40°C (cSt)	Pour Point °C	Viscosity Index	Vapor Pressure Torr@25 °C ^(a)
Grease	8511	-50 to 225	65	-54	255	10 ⁻⁸
	8511E	-50 to 225	65	-54	255	10 ⁻⁸
	8511R	-50 to 225	65	-54	255	10 ⁻⁸
	8512	-50 to 225	65	-54	255	10 ⁻⁸
	8512S	-50 to 225	65	-54	255	10 ⁻⁸
	8512R	-50 to 225	65	-54	255	10 ⁻⁸
	8521	-45 to 225	168	-48	213	10 ⁻⁹
	8531	-40 to 225	230	-41	178	10 ⁻⁹
Oil	8510	-50 to 225	65	-54	255	10 ⁻⁸
	8520	-45 to 225	168	-48	213	10 ⁻⁹
	8530	-40 to 225	230	-41	178	10 ⁻⁹

^(a)) Data indicates maximum vapor pressure for each product. Under certain operating conditions, current formulations may offer even lower vapor pressures. For applications that require vapor pressures lower than 10⁻¹⁰ Torr @ 25°C, call Nye.

Suffix Legend: R = rust inhibitor; S = NLGI Grade 1 soft grease; E = Extreme Pressure Additive

UniFlor 8600 Series

Wide- temperature, viscous lubricants or sealants for industrial bearings and vacuum applications.

	Prod. Number	Temp. Range °C	Base Oil Viscosity @40°C (cSt)	Pour Point °C	Viscosity Index	Vapor Pressure Torr@25 °C ^(a)
Grease	8612	-20 to 250	345	-25	136	10 ⁻⁹
	8622	-15 to 250	510	-20	135	10 ⁻⁹
Oil	8610	-20 to 260	345	-25	136	10 ⁻⁹
	8620	-20 to 260	510	-20	135	10 ⁻⁹

UniFlor 8700 Series

Wide- temperature, high- load, bearing lubricants with ultra- low volatility that offers excellent resistance to oxide-induced catalysis.

	Prod. Number	Temp. Range °C	Base Oil Viscosity @40°C (cSt)	Pour Point °C	Viscosity Index	Vapor Pressure Torr@25 °C ^(a)
Grease	8711	-70 to 200	25	-75	150	10 ⁻⁷
	8731	-60 to 225	65	-65	180	10 ⁻⁸
	8751	-54 to 250	100	-60	200	10 ⁻¹⁰
	8751R	-54 to 250	100	-60	200	10 ⁻¹⁰
	8771	-50 to 250	200	-53	210	10 ⁻⁹
Oil	8710	-70 to 200	25	-75	150	10 ⁻⁷
	8730	-60 to 225	65	-65	180	10 ⁻⁸
	8750	-54 to 250	100	-60	200	10 ⁻¹⁰
	8770	-50 to 250	200	-53	210	10 ⁻⁹

UniFlor 8900 Series

Extreme- temperature lubricants for small, delicate precision instruments, sensors, potentiometers, actuators, and bearings where low - temperature and low torque are critical design parameters.

	Prod. Number	Temp. Range °C	Base Oil Viscosity @40°C (cSt)	Pour Point °C	Viscosity Index	Vapor Pressure Torr@25 °C ^(a)
Grease	8951	-90 to 200	18	-90	317	10 ⁻⁸
	8961	-80 to 200	33	-85	336	10 ⁻⁹
	8961R	-80 to 200	33	-85	336	10 ⁻⁹
	8971	-75 to 225	90	-80	320	10 ⁻⁹
	8971R	-75 to 225	90	-67	320	10 ⁻⁹
	8981	-65 to 250	140	-67	345	10 ⁻¹⁰
	8981R	-65 to 250	140	-67	345	10 ⁻¹⁰
	8981S	-65 to 250	140	-67	345	10 ⁻¹⁰
Oil	8950	-90 to 225	18	-90	317	10 ⁻⁹
	8970	-75 to 250	90	-80	320	10 ⁻⁹
	8980	-65 to 250	140	-66	345	10 ⁻¹⁰
	8990	-60 to 250	335	-63	365	10 ⁻¹⁰



The World Leader in Synthetic Lubricants

