Since 1844 Nye®

Lubenotes:

Design Engineer's Guide to Selecting a Lubricant

Lubricants for Gear Motors, Gear Boxes and Power Tool Gearing

The rolling and sliding actions which occur in all types of gearing, such as spur, helical, worm, spiral bevel or hypoid, present a different type of challenge to lubricants compared to ball or roller bearings. Many designers, especially worm gear designers, are interested in increasing gear box efficiency. Modern designs require the most in power transfer with minimal noise and heat generation. In some cases, oils are being replaced by specially designed synthetic greases to reduce component cost by eliminating the need for seals and the machining costs associated with oil seal designs. Other gear train designs may have special operating environments including high and low temperature, corrosion and oxidation concerns.

With modern lubricants, these challenges can be met very effectively. Utilizing various synthetic base oils and gellants these lubricants not only minimize friction but can inhibit wear and corrosion, dampen noise and control free motion. They can meet broad temperature requirements without oxidizing or evaporating. And they can provide manufacturers of today's power transmission devices with an "edge" that will increase the performance and life of their products.

Synthetic vs. petroleum-based lubricants. In theory, the "perfect lubricant" won't oxidize, suffer thermal breakdown, evaporate or allow surface contact for the life of the device. Generally ambient temperature range plays a major role in determining whether to use a synthetic or petroleum-based lubricant. Synthetics tend to function better at wider temperature ranges than petroleum products. Petroleum products begin to degrade at or before 100°C, whereas synthetic hydrocarbon lubricants function well to 125°C. By comparison, UniFlor™ fluoroether lubricants provide excellent lubricating qualities to 250°C.

Synthetics offer extreme low temperature advantages as well. Synthetic lubricants have lower vapor pressures than petroleum products, consequently, even without the presence of oxygen, synthetics are less volatile, an important factor in ensuring that the lubricant does not breakdown. In summary, the chemical homogeneity of synthetic lubricants results in greater load carrying capacity, higher viscosity indexes, better lubricity, greater efficiency and extended serviceability than their petroleum-based counterparts.

Selecting the right lubricant for your application. Following is a partial list of popular Nye lubricants for gearing applications. Additional oils and greases are available to meet a wide range of application requirements. For technical specifications, evaluation samples, questions about any Nye products, or to discuss a lubricant custom-designed for your application — call us at +1.508.996.6721 or visit our website at NyeLubricants.com.

On the back of this page is a partial list of the most commonly used Nye synthetic lubricants for gearing applications.

Contact Nye at +1.508.996.6721
or contact@nyelubricants.com

Lubenotes: Lubricants for Gear Motors, Gear Boxes and Power Tool Gearing

General Purpose Gear Greases	Base Oil Chemistry	Temp Range (°C)	ISO Viscosity Grade	Base Oil Viscosity @ 40°C	NLGI Grade	Dropping Point (°C)	Consistency
NyoGel® 788	PAO/Polybutene	-20 to 125	460	291	1	Over 350	Medium/Soft
Rheolube® 368AX-1*	PAO	-20 to 125	220	259	2	255	Medium
NyoGel® 792D	PAO	-30 to 125	150	182	0	260	Semi-fluid
Rheolube® 368SM*	PAO	-40 to 120	220	243	0.5	200	Very Soft
Rheolube® 377AL*	PAO	-40 to 125	46	45	1	194	Soft
Rheolube® 723GR	PAO	-40 to 125	68	80.6	0.5	205	Very Soft
Rheolube® 363AX-1*	PAO	-50 to 125	46	40.7	2	220	Medium
Instrument Grease 794A	PAO/Ester	-20 to 150	460	440	2	260	Medium
Rheolube® 380*	PAO/Ester	-50 to 130	32	33.6	2	194	Medium
Rheolube® 380-G1*	PAO/Ester	-50 to 130	32	37	1	190	Soft

** EP-Fortified*

High-Temperature Gear Greases	Base Oil Chemistry	Temp Range (°C)	ISO Viscosity Grade	Base Oil Viscosity @ 40°C	NLGI Grade	Dropping Point (°C)	Consistency
UniFlor™ 8531	PFPE	-40 to 225	220	230	2	Non-melting	Medium
UniFlor™ 8511	PFPE	-50 to 225	68	65	2	Non-melting	Medium

Flea-Power Gear Grease	Base Oil Chemistry	Temp Range (°C)	ISO Viscosity Grade	Base Oil Viscosity @ 40°C	NLGI Grade	Dropping Point (°C)	Consistency
NyoGel® 741E	Phenylmethyl Silicone	-50 to 200	150	151	0	223	Semi-fluid

Food Grade Gear Greases	Base Oil Chemistry	Temp Range (°C)	ISO Viscosity Grade	Base Oil Viscosity @ 40°C	NLGI Grade	Dropping Point (°C)	Consistency
NyoGel® 670F	PAO	-35 to 120	220	194	2	Non-melting	Medium
Fluorocarbon Gel 800	Ester	-35 to 150	100	104.5	2	300	Medium
Fluorocarbon Gel 800GR-1	Ester	-35 to 150	100	104.5	1	306	Soft
UniFlor™ 8931	PFPE	-70 to 250	320	310	2	Non-melting	Medium

Nye Lubricants, Inc. 12 Howland Road Fairhaven, MA 02719 USA Ph: +1.508.996.6721 NyeLubricants.com