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 (508) 996-6721 or visit our Web site at www.nyelubricants.com.

General Purpose Gear Greases	Temp Range (°C) Grade	ISO Viscosity	Base Oil Viscosity @ 40°C	NLGI Grade	Dropping Point (°C)	Consistency
Rheolube 380G1*	-50 to 130	32	32	1	190	Soft
Rheolube 380*	-50 to 130	32	32	2	190	Medium
Rheolube 377AL*	-40 to 125	46	45	1	200	Soft
Rheolube 363AX-1*	-40 to 125	68	60	2	200	Medium
Rheolube 723GR	-40 to 125	68	73	1	205	Soft
NyoGel® 792D	-30 to 125	150	182	00	260	Semi-fluid
Rheolube 790G	-40 to 125	150	148	1	260	Soft
Rheolube 368SM*	-40 to 125	320	284	0	200	Very Soft
Rheolube 368AX-1*	-20 to 125	220	225	2	200	Medium
Rheolube 788	-20 to 125	460	409	1	260	Soft
Rheolube 794	-20 to 150	460	460	2	260	Medium

* *EP-Fortified*

High-Temperature Gear Greases	Temp Range (°C)	ISO Viscosity Grade	Base Oil Viscosity @ 40°C	NLGI Grade	Dropping Point (°C)	Consistency
UniFlor™ 8511	-50 to 225	68	65	2	Non-melting	Medium
UniFlor™ 8531	-30 to 225	320	270	2	Non-melting	Medium

Flea-Power Gear Greases	Temp Range (°C)	ISO Viscosity Grade	Base Oil Viscosity @ 40°C	NLGI Grade	Dropping Point (°C)	Consistency
Fluorocarbon Gel 813-1	-70 to 200	68	53	1	Non-melting	Soft
NyoGel® 781A	-70 to 200	68	55	0	200	Very Soft
NyoGel® 741F	-54 to 200	68	84	00	227	Semi-fluid

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