

L I N E A R L U B R I C A N T S

1st Edition



www.helixlinear.com



Introduction

Many factors must be considered when designing or selecting a lead screw or acme screw. Operating load, speed, accuracy, environment, and power requirements all play major roles in the design decision. A properly selected lubricant minimizes friction, reduces torque, increases the screw's efficiency, and extends performance life.

Enhancing grease performance

High quality synthetic greases offer many performance advantages over mineral-based lubricants. Synthetic lubricants function over wider temperature ranges; they offer greater thermo-oxidative stability and lower volatility; and they retain the viscosity needed to provide an adequate film thickness through a specified range of operating temperatures, speeds and loads. Special additive packages can further improve grease's natural ability to resist water wash-out and reduce wear in the presence of shock-loading and vibration.

Specifying a lubricant

Proper lubrication plays an especially vital role in the performance and life of Acme lead screws with bronze or polymer nuts. Even with self-lubricated nuts, lead screw performance can be significantly enhanced with light greases. Additional lubrication can also reduce heat in these units. Our Helix Copolymer or plastic nuts benefit from silicone-based greases and PTFE additives, which lower friction, increase efficiency and prolong performance life. Solid lubricants such as our Helix PTFE dry coating may also improve the roughness associated with the increased preloads of anti-backlash nuts.

Ultrafiltration

Ultrafiltration removes virtually all particulate matter from grease and oil. For greases, it also improves the homogeneity of the thickening agent.

Lead screw applications, where precise motion and smooth, quiet operation are desired, can take advantage of this ultrafiltration technology. Ultrafiltration of grease and oil results in lubricants with unsurpassed cleanliness. For greases, ultrafiltration also improves the homogeneity of the thickening agent.



Greases for All Purpose Applications – Page 4

Part Number	Volume	Temp Range (C)	Applications
APG-2G	2 gram Packet	-54 to 125	A lithium soap thickened, light viscosity, synthetic hydrocarbon grease for instruments and bearings. Excellent for wide temperature performance.
APG-50G	50 Gram Jar		

Greases for Medical Grade Applications – Page 5

Part Number	Volume	Temp Range (C)	Applications
MLG-4G	4 gram Packet	-65 to 250	A PTFE thickened, high viscosity, completely fluorinated grease for use in high temperature applications exposed to aggressive chemicals. It possesses excellent thermo-oxidative stability and low vapor pressure characteristics.
MLG-100G	100 Gram Jar		

Greases for Semiconductor/Static Dissipative Applications – Page 6

Part Number	Volume	Temp Range (C)	Applications
SSG-3.5G	3.5 Gram Pipette	-65 to 250	A PTFE thickened, heavy viscosity. Perfluoropolyether grease intended for high vacuum and clean room applications, spacecraft and semiconductor manufacturing equipment. Benefits include very low vapor pressure.
SSG-50G	50 Gram Jar		

Greases for Military and Aerospace Applications – Page 7

Part Number	Volume	Temp Range (C)	Applications
MAG-4G	4 gram Packet	-80 to 200	A PTFE Thickened, medium viscosity, completely fluorinated grease intended for components where wide temperature and low torque are critical. Meets MIL-RRF-27617F, Type IV specifications for aircraft ANO instrument; fuel and oxidizer resistant.
MAG-100G	100 Gram Jar		

Greases for General Industrial Applications – Page 8

Product Name	NLGI Grade Number	Gelling Agent	Temp. Range	Net Contents Per Unit	Part No.	Total Weight	Benefits
PAG-1 Grease	2	Calcium	15°F to 400°F	1	NLU-1001	1 lb.	<ul style="list-style-type: none"> • Shear stability • High temperature resistant • Corrosion protection • Separation resistant • Extreme pressure properties • Shelf stable • Water resistant
				Case of 12	NLU-2001	13 lb.	
E-100 Spray				1	NLU-1002	1 lb.	
				Case of 12	NLU-2002	12 lb.	

All Purpose Grade

Linear Lubricants

A lithium soap thickened, light viscosity, synthetic hydrocarbon grease for instruments and bearings. Excellent for wide temperature performance.

Lubricant Properties	Typical Value	Test Method
Recommended Service Range (°C)	-54 to 125	
Thickener	Lithium Soap	
Base Oil	Polyalphaolefin	
Type		
Kinematic Viscosity, -40°C	8400 cSt	ASTM D-445
40°C	32.6 cSt	
100°C	5.7 cSt	
Viscosity Index	135	ASTM D-2270
Pour Point, °C	-60	ASTM D-97
Apparent Viscosity		

Typical Properties of the Grease	Typical Value	Test Method
Color, Appearance	Off-White, Smooth	
Penetration (1/10 mm)	NLGI Grade	
	2	ASTM D-217
	Unworked	272
	Worked, 60X	278
Density	25°C	0.92 g/cm ³
Dropping Point		207
Oil Separation	24 hours, 100°C	2.4
Evaporation	24 hours, 100°C	0.1
4 Ball Wear	60 minute(s), 1200RPM, 40kg load, 75°C	0.6 mm
Low Temp Torque	Starting Torque, -40°C	1180 g/cm
	Running Torque, 10 minute(s), -40°C	796 g/cm
	60 minute(s), -40°C	236 g/cm
SRV, Step Load		700 N
Load Wear Index		

The typical properties shown on this product data sheet should not be used as a basis for preparing specifications. Refer to our product MSDS for detailed safety information on this product.



APG-50G



APG-2G

Medical Grade

Linear Lubricants

A PTFE thickened, heavy viscosity, completely fluorinated grease for use in high temperature applications exposed to aggressive chemicals. It possesses excellent thermo-oxidative stability and low vapor pressure characteristics.

Lubricant Properties	Typical Value	Test Method
Recommended Service Range (°C)	-65 to 250	
Thickener	PTFE	
Base Oil	Perfluoropolyether	
Type		
Kinematic Viscosity, 100°C	40 cSt	ASTM D-445
40°C	135 cSt	ASTM D-445
Viscosity Index	334	ASTM D-2270
Flash Point, °C	None, Non-Flammable	ASTM D-92
Pour Point, °C	-73	ASTM D-97

Typical Properties of the Grease	Typical Value	Test Method
Color, Appearance	White	
Penetration (1/10 mm)	Unworked	269
	Worked, 60X	295
	NLGI Grade	2
Density	25°C	1.83 g/cm ³
Oil Separation	24 hour(s), 100°C	4.7%
Evaporation	24 hour(s), 200°C	0.1%

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MLG-100G



MLG-4G

Semiconductor/Static Dissipative

Linear Lubricants

A PTFE thickened, heavy viscosity, perfluoropolyether grease intended for high vacuum and clean room applications, spacecraft and semiconductor manufacturing equipment. Benefits include very low vapor pressure.

Lubricant Properties	Typical Value	Test Method
Recommended Service Range (°C)	-65 to 250	
Thickener	PTFE	
Base Oil	Perfluoropolyether	
Type		
Kinematic Viscosity, -40°C	2300 cSt	ASTM D-445
40°C	140 cSt	
100°C	45 cSt	
Viscosity Index	345	ASTM D-2270
Pour Point, °C	-75	ASTM D-97

Typical Properties of the Grease	Typical Value	Test Method
Color, Appearance	White, Smooth	
Penetration (1/10 mm)		
Unworked	255	ASTM D-217
Worked, 60X	273	ASTM D-217
NLGI Grade	1.5	ASTM D-217
Density	1.91 g/cm ³	NYE CTM
25°C		
Oil Separation	5.8	ASTM D-6184
24 hours, 100°C		
Evaporation	0.02	
24 hours, 100°C		
Low Temp Torque		
Starting Torque, -25°C	236g/cm	
Running Torque, 10 minute(s), -25°C	142 g/cm	
60 minute(s), -25°C	100 g/cm	
SRV, Step Load	100 N	ASTM D-5706
Load Wear Index		ASTM D-2596
Weld Load	620	

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SSG-50G



SSG-3.5G

Aerospace & Military Grade

Linear Lubricants

A PTFE thickened, medium viscosity, completely fluorinated grease intended for components where wide temperature and low torque are critical.

Meets MIL-RRF-27617F, Type IV specifications for aircraft ANO instruments; fuel and oxidizer resistant.

Lubricant Properties	Typical Value	Test Method
Recommended Service Range (°C)	-80 to 200	
Thickener	PTFE	
Base Oil	Perfluoropolyether	
Type		
Kinematic Viscosity, 100°C	21.7 cSt	ASTM D-445
40°C	71 cSt	ASTM D-445
Viscosity Index	330	ASTM D-2270
Flash Point, °C	300	ASTM D-92
Pour Point, °C	-80	ASTM D-97

Typical Properties of the Grease	Typical Value	Test Method
Color, Appearance	White	
Penetration (1/10 mm)		
Unworked	297	ASTM D-217
Worked, 60X	300	ASTM D-217
NLGI Grade	1-2	ASTM D-217
Density	1.9 g/cm ³	NYE CTM
25°C		
Oil Separation	15.4	ASTM D-6184
30 hours, 204°C		
Evaporation	3.31%	ASTM D-972
22 hours, 204°C		
4 Ball Wear	0.72mm	ASTM D-4172
60 minute(s), 1200RPM, 40 kg load, 240°C		
Low Temp Torque		
Starting Torque, -73°C	1416 g/cm	
Running Torque, 10 minute(s), -73°C	472.9 g/cm	
60 minute(s), -73°C	456.2 g/cm	
Load Wear Index		ASTM D-2596

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MAG-100G



MAG-4G



Proper Lubrication is the key to continued performance and reliability of acme screw assemblies. Use E-100 spray and PAG-1 grease lubricants to maximize the life of your acme screw assembly.

Product Name	NLGI Grade Number	Gelling Agent	Temp. Range	Net Contents Per Unit	Part No.	Total Weight	Benefits
PAG-1 Grease	2	Calcium	10°F to +400°F	1	NLU-1001	1 lb.	<ul style="list-style-type: none"> • Shear stability • High temperature resistant • Corrosion protection • Separation resistant • Extreme pressure properties • Shelf stable • Water resistant
				Case of 12	NLU-2001	13 lb.	
E-100 Spray	2	Calcium	10°F to +400°F	1	NLU-1002	1 lb.	
				Case of 12	NLU-2002	12 lb.	



E-100 Spray

PAG-1 Grease

MINIATURE LINEAR GUIDES

The compact design of Helix Miniature Linear Guides offers greater design flexibility compared to other linear guidance systems. Helix has brought to market a new embedded inverse hook design that tightly secures block components to better handle impact forces more effectively by distributing the stress over a larger area, thereby improving your high speed running capability.

Design Features and Benefits

- Unique Ball Re-circulation Design reduces noise significantly, extends life and reduces maintenance
- HMR-EE Series Stainless Steel Reinforced Plates ensure a high level of robustness and supports higher running speeds

- Embedded Lubrication Pad efficiently lubricates balls, oils raceway and provides a selection of options for machine design
- High Load & High Moment Capacity due to greater surface contact than competing products
- Dust Proof Design restricts dust contamination and prolongs lubrication for longer life
- Sizes 3, 5, 7, 9, 12, 15
- Interchangeable with most brands
- Three accuracy grades available: Precision (P), High (H), Normal (N)
- One week delivery

Standard Rail with Standard Block



Wide Rail with Standard Block



Standard Rail with Long Block



Wide Rail with Long Block



EZZE-MOUNT™ bearing blocks contain precision anti-friction bearings and are designed to be used with lead screws. Single and double bearing base mount and flange mount versions of EZZE-MOUNT™ bearing blocks are available and provide a complete solution for most linear motion applications.

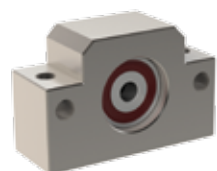
Bearing mounts must be designed to withstand both the radial and the thrust loads generated by the application's screw assembly.

Helix also provides the following end machining services:

- Screws cut to precision lengths
- Straightening
- CNC turning and milling
- Grinding
- Assembly of bearing mounts
- Inspection
- Specialized material handling and packaging



Universal-Mount
Double Bearing



Universal-Mount
Single Bearing



Flange-Mount
Double Bearing



Flange-Mount
Single Bearing



SCREW ASSEMBLIES

- 4mm – 150mm / 1/4" – 6"
- Alloy, Stainless Steel, Aluminum, Bronze, Brass, Titanium
- Standard or Anti-backlash Nuts
- +/- 0.0003" / inch Standard Lead Accuracy
- Rolled or Precision Ground Screws



CUSTOM NUTS

- Molded or Machined
- Engineered Plastic, Bronze, Steel, Aluminum
- Free-wheeling or Anti-backlash Nuts
- Integrate Other Components into the Nut Design
- Insert Molding – Threaded Inserts



PTFE COATINGS

- Increase Efficiency
- Eliminate Grease and Oil
- Extended Nut Life
- Coating Process is Fully Automated



END MACHINING SERVICES

- Increased Performance
- Precision Machining
- High Volume Machining

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