FUCHS Special Applications

NYETORR 6350EL & 6370

PFPE ultra-high-vacuum greases deliver the highest load-carrying capacity and life-endurance performance in the aerospace industry.

LUBRICANTS.
TECHNOLOGY.
PEOPLE.

FUCHS

MOVING YOUR WORLD

Lubricating Space Mechanisms

When compared with the top-performing PFPE lubricants on the market, NYETORR 6350EL & 6370EL demonstrate a significant improvement in friction, wear and durability, thus extending the life of bearings and other space mechanisms.

NYETORR 6350EL & 6370EL have shown greater than a 12x improvement in the life of rolling element bearings over traditional vacuum lubricants, while also demonstrating excellent performance in both boundary and mixed lubrication regimes. The outgassing of these new greases demonstrates less than half the mass loss when compared with any other available PFPE greases on the market.

NYETORR 6350EL & 6370EL provide:

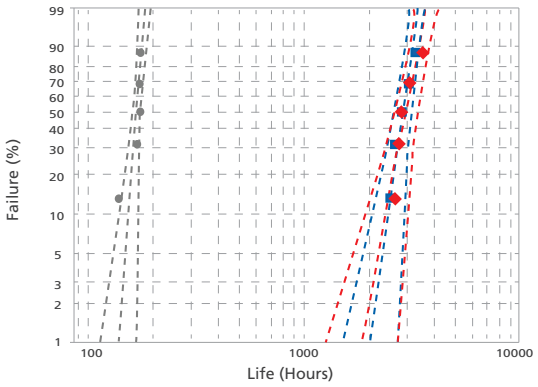
- Excellent low-temperature performance
- The lowest level of outgassing
- The highest load-carrying & life endurance performance

The introduction of NYETORR 6350EL & 6370EL marks a leap forward in PFPE lubricant technology. These greases increase the durability, functionality and reliability of any rolling or sliding space mechanism to prolong the life of components and outlast your mission life requirements.

Graph Key: Heritage PFPE | NYETORR 6350EL | NYETORR 6370EL

Component Life

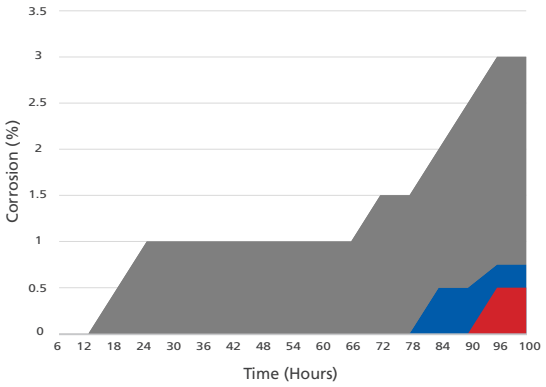
Weibull Life Probability Plot



Test Details: R0F+ Deep Groove Ball Bearing Life (Fr = 100N, Fa = 200N, 230 °C, 10,000 RPM)

Bearing Corrosion

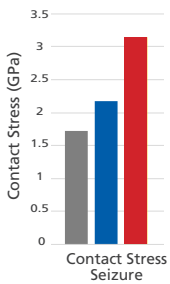
Corrosion Performance (ASTM D1743)



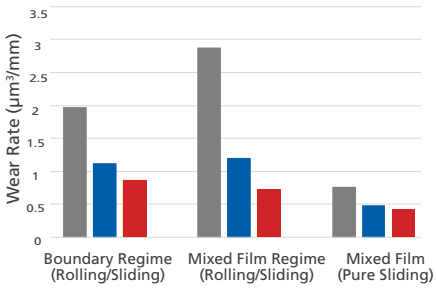
Test Details: 52°C in Distilled Water

Load Capacity & Wear

Load Capacity



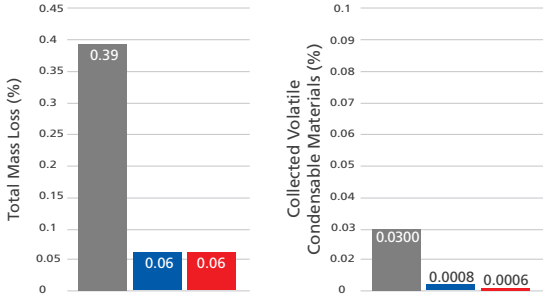
Wear Rate



Test Details: Tested using a SRV Reciprocating Tribometer & Mini Traction Machine

Outgassing

Vacuum Stability (ASTM E595)



Test Details: 125 °C, 24 h, 8.0 x 10^{-6} Torr

The Future of Space

The future of space exploration and the mechanisms that make it possible will require even more protection from the exposure to a variety of extreme conditions. The durability and reliability of all the mechanisms, including the lubrication, will need to be improved for long range space exploration missions to be possible. These missions will include exposure to ultra-high vacuum, radiation and temperature extremes (both hot & cold); thus making higher performance and extended life lubricants a requirement.

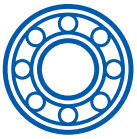
First and foremost, the future of lubricants for space mechanisms will require a longer expected life and reliability, as the ability to service or replace components during extended voyages will be very limited or non-existent. Low outgassing materials to prevent contamination of any critical system on the vessel will also be a requirement. Finally, the environmental durability of a lubricant will be important for the extreme temperatures of deep space, as well as possible exposure to ozone, radiation, or other corrosive gasses.

Whatever trials lie ahead, FUCHS and our Research & Development team is ready to meet the challenges on planet Earth, new unexplored planets, and the deep regions of space in-between.

Typical Applications

Ball/Lead Screws

Gears/Actuators



Precision Bearings

Advantages of NYETORR

- Extends functional life of components
- Increases load-carrying capabilities
- Ensures extremely low outgassing
- Reduces friction & wear
- Improves durability and reliability of mechanisms
- Provides excellent corrosion protection

FUCHS Today:

Our performance is reflected in the value we bring to our customers. FUCHS is a leader in the innovation, formulation and provision of synthetic lubricants, enabling and improving breakthrough products and critical new technologies. We bring proven experience, deep technical knowledge and intense customer focus to solve our customers' toughest challenges, adding tangible value to products in a wide range of industries and applications.

Lubricant Properties		Heritage PFPE	NYETORR 6350	NYETORR 6370EL	Test Method
Base Oil		PFPE	PFPE	PFPE	
Temperature Range		-80 to 204°C	-80 to 250 °C	-90 to 250 °C	
Kinematic Viscosity	40°C	148 cSt	200 cSt	362 cSt	ASTM D445
	100°C	45 cSt	48 cSt	103 cSt	ASTM D445
Worked Penetration (P60)		288	281	285	ASTM D1403
Oil Separation (24h, 100°C)		6.24%	6.30%	4.73%	ASTM D6184
Particulate Count (10 - 34 microns)		<1,000/cc	<400/cc	<400/cc	FED-STD791D
4 Ball-Wear (40-kg load, 1200RPM, 1 hr, 75°C)		0.91 mm	0.74 mm	0.67 mm	ASTM D2266
Vacuum Stability	TML	0.39	0.06	0.06	ASTM E595
	CVCM	0.0300	0.0008	0.0006	NASA SP-R-0022A
ROF+ Bearing Life L50 (Fr=100N, Fa=200N, 230°C, 10,000RPM)		167 h	>2,400 h	>2,200 h	CTM*
Bearing Corrosion (96 h, 52 °C, Distilled Water)		Fail	No Corrosion	No Corrosion	ASTM D1743
Knudsen Vapor Pressure	25 °C	5.28 E^{-08}	7.05 E^{-16}	6.29 E^{-16}	CTM*
	200 °C	2.12 E^{-05}	2.92 E^{-06}	2.96 E^{-06}	CTM*
Dynamic Particle Generation		ISO 5	ISO 4	ISO 4	CTM*

*CTM: Company Test Method

FUCHS Lubricants

Innovative lubricants need experienced application engineers

Every lubricant change should be preceded by expert consultation on the application in question. Only then can the best lubricant system can be selected. Experienced FUCHS engineers will be glad to advise on products for the application in question and also on our full range of lubricants.

FUCHS LUBRICANTS CO.
12 Howland Road
Fairhaven, MA 02719
United States
Phone 508-996-6721
E-mail inquiry@fuchs.com
www.fuchs.com/us