

LOCKHEED MARTIN

INDUSTRY:
Aerospace

APPLICATION:
HD Satellite Camera

COMPONENT:
Bearings

LOCATION:
California



BACKGROUND

Lockheed Martin designs and manufactures advanced technology systems and products for the aerospace industry. Their new Expedite program involved the development of a satellite fitted with next-generation high-definition cameras. They were working with The Aerospace Corporation, a non-profit FFRDC organization, on a project to reduce volatile contaminants close to the camera's lens. Both companies were concerned that the cameras would be compromised if volatiles settled near the lens and fogged it up.

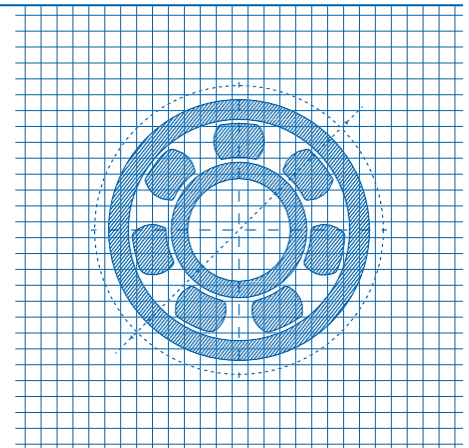
CHALLENGE

- Can Nye decrease the outgassing rate of both Rheolube® 2000 and Rheolube® 2004?
- Can this project be completed in time for the satellite launch?

SOLUTION

RHEOLUBE® 2000LO & RHEOLUBE® 2004LO

- A stripping procedure was developed by Lockheed Martin and Nye.
- Daily samples were rushed to The Aerospace Corporation to evaluate.
- Nye purchased a vacuum oven that was large enough and could pull the required vacuum level to treat the lubricant. Nye modified the vacuum oven to control and monitor heat precisely.
- Tests to confirm the extreme requirements of the lubricants were performed by Nye, Lockheed Martin and The Aerospace Corporation.



RESULTS

The result of all these efforts was the birth of Rheolube® 2000LO and Rheolube® 2004LO. Both are sodium complex soap thickened, cyclopentane greases intended for aerospace and vacuum instruments. The project was a huge success. According to an unclassified report by a Lockheed Martin employee the "Stripped Grease is Awesome." Nye demonstrated to Lockheed Martin our "can do attitude."

Base Oil Properties	Conditions	Rheolube® 2000LO	Rheolube® 2004LO	Test Method
Chemistry		Cyclopentane / Sodium Soap	Cyclopentane / Sodium Soap	
Temperature Range		-45 to 125°C	-45 to 125°C	
Kinematic Viscosity	40°C	110 cSt	110cSt	ASTM D-445
Grease Properties				
Oil Separation	24 hrs, 100°C	3.3%	0.1%	ASTM D-6184
Penetration	Worked 60x	270	271	ASTM D-217
Outgasing	45°C, 72 hours, 80K	6.0 ×10-10 g/cm²/s Maximum	6.0 ×10-10 g/cm²/s Maximum	ASTM E-1559

Since 1844: Our performance is reflected in the value we bring to our customers.

Nye Lubricants 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 customer focus to solve our customers' toughest challenges, adding tangible value to products in a wide range of industries and applications.

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