Case Study

NYE LUBRICANTS SUCCESS STORIES

LOCKHEED MARTIN

Industry: Aerospace

Application: HD Satellite Camera

Component: Bearing

Location: Sunnyvale, CA

Time Period: January 2007 - March 2007

BACKGROUND

Lockheed Martin designs and manufactures advanced technology systems and products for the aerospace industry. The company was launching a new generation of high definition satellite cameras. They were working with The Aerospace Corporation 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, potentially fogging it up.

For more information, contact our technical expert.

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CHALLENGES

- 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

1. Several stripping procedures that would remove volatiles from the grease without depleting the additive package were developed.
2. Daily samples were rushed to The Aerospace Corporation to evaluate.
3. A stripping procedure was selected and verified by Lockheed Martin.
4. Nye upscaled the process to fulfill the volume of grease needed for the launch date.
5. Nye purchased a vacuum oven that was large enough and could pull the required vacuum level to treat the lubricant.
6. The vacuum oven was modified by Nye to control and monitor heat precisely.
7. Nye stripped production batches of both Rheolube® 2000 and Rheolube® 2004.
8. Tests to confirm the extreme requirements of the lubricants were performed by Nye, Lockheed Martin and The Aerospace Corporation.

HD Satellite Camera

RESULTS

Lubricant Properties		Rheolube® 2000-LO	Rheolube® 2004-LO	Test Method
Base Oil		Cyclopentane	Cyclopentane	
Thickener		Sodium Soap	Sodium Soap	ASTM D-445
Temperature Range		-45 to 125°C	-45 to 125°C	
Penetration	Unworked	290	261	ASTM D-1403
	Worked 60x	295	267	
Oil Seperation (24 hours, 100°C)		3.3%	0.43%	ASTM D-6184
Outgassing (45°C, 72 hours, 80K)		6.0 ×10-10 g/cm2/s Maximum	6.0 ×10-10 g/cm2/s Maximum	ASTM E-1559

The result of all these efforts was the birth of Rheolube® 2000-LO and Rheolube® 2004-LO. 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."