

Case Study

NYE LUBRICANTS SUCCESS STORIES

CONFIDENTIAL



Industry: Semiconductor

Application: Wafer Transfer Robot in Vacuum Environment

Component: Bearing

BACKGROUND

A company that manufactures robots for the semiconductor industry needed a high temperature, ultra-low outgassing, grease for robots operating on OLED Display (organic light-emitting diode) manufacturing lines. The environmental conditions were high vacuum and typical operating temperatures were in the range of 160°C to 240°C. The company was using NyeTorr® 5300 and NyeTorr® 6300 greases in the application, but wanted to improve the outgassing properties.

For more information, contact our technical expert.

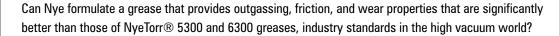
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CHALLENGE



Bearing in Robot Arm



SOLUTION



- Nye chemists were given testing requirement specs that the new grease had to exceed.
- An experimental grease, now known as Nye Exp. JG160802, was formulated.
- Vapor pressure, outgassing, and vacuum stability tests were conducted.
- 4. Testing results were at the lowest edge of detection Nye had ever seen for a lubricant.
- Testing was also completed to ensure friction and wear characteristics of the grease were not affected by the special processing necessary for low outgassing results.

Lubricant Properties		Exp. JG160802	NyeTorr® 6300	Test Method
Base Oil		PFPE	PFPE	
Thickener		PTFE	PTFE	
Temperature Range		-70 to 250°C	-65 to 250°C	
Kinematic Viscosity	40°C	204.5 cSt	186.8 cSt	ASTM D-445
	100°C	61.6 cSt	56.1 cSt	
Outgassing/TML (125°C, 24h)		0.007 %	0.026 %	ASTM E-595
4 Ball Wear (24h, 1200RPM)	20kg	0.6 mm	1.0 mm	ASTM D-2266
	40kg	1.1 mm	1.3 mm	
Knudsen Vapor Pressure (torr)	200°C	3.05 E-08	8.55 E-08	CTM - 053

RESULTS

Exp. JG160802 grease met customer requirements for all specs, including outgassing results that were four times lower than NyeTorr® 6300 results. Exp. JG160802 is currently being used in the bearing as an ultralow outgassing grease with low torque and good friction and wear properties.