

# LOW-OUTGASSING GREASE FOR FLAT PANEL DISPLAY

**INDUSTRY:**  
Semicon & In-Vacuum

**APPLICATION:**  
Flat Panel Display Robots

**COMPONENT:**  
Cross Arm Bearings

**LOCATION:**  
Japan & South Korea



## BACKGROUND

A semiconductor equipment manufacturer who specializes in automation and semiconductor production equipment approached Nye to find the right lubricant for their cross-arm robot bearings. These mechanisms, which manufacture flat panel displays, operate at high temperatures of up to 200°C under high vacuum. The manufacturer's customer was having issues with outgassing contamination caused by a heritage lubricant. The customer needed a soft, low outgassing lubricant that would reduce contamination and improve wear performance.

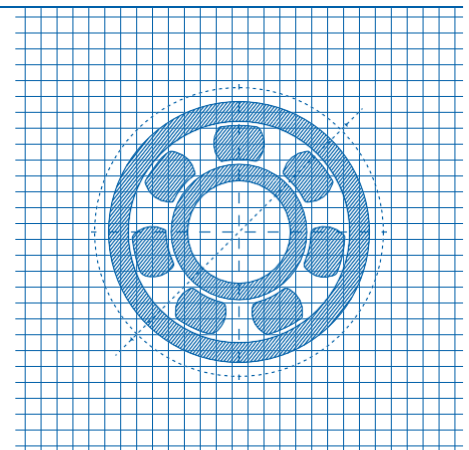
## CHALLENGE

- Can we provide a low outgassing, high-temperature, high-vacuum lubricant?
- Can we provide a soft grease for easy dispensing?

## SOLUTION NYETORR® 6300S

A PTFE thickened, heavy viscosity, perfluoropolyether grease.

- Wide operating temperature of -75 to 250°C
- Extremely low vapor pressure and outgassing properties
- NLGI Grade 1, softness comparable to mustard.
- Reduces friction to extend bearing life.



## RESULTS

Nye provided the customer with a sample of NyeTorr® 6300 which met their outgassing requirements but proved too stiff for their application. Nye formulated NyeTorr® 6300S, a softer version of NyeTorr® 6300 which was then tested and proven to have low outgassing properties and high penetration values for easy dispensing. NyeTorr® 6300S reduced the customer's risk of contamination and they remain satisfied with its performance.

Base Oil Properties	Conditions	NyeTorr® 6300S	Test Method
Chemistry		PFPE/PTFE	
Temperature Range		-75 to 250°C	
Kinematic Viscosity	-40°C	5818 cSt	ASTM D-445
	40°C	188.3 cSt	
	100°C	56.8 cSt	
<b>Grease Properties</b>			
Penetration (1/10mm)	Unworked	315	ASTM D-217
	Worked (60X)	321	
NLGI Grade		1	ASTM D-217
Oil Separation	24 hrs, 150°C	11.97%	ASTM D-6184
Evaporation	24 hrs, 150°C	0.12%	ASTM D-972
Low Temp Torque	Starting (-25°C)	147.5 g/cm	
	Running (10 mins, -25°C)	88.5 g/cm	
	Running (60 mins, -25°C)	74.7 g/cm	

**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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