



Nye Lubricants for Cleanroom and Vacuum Applications

Today's vast array of electromechanical devices in semiconductor wafer fabrication, flat panel, solar panel and LCD manufacturing equipment places increasingly challenging demands on the lubricants used to keep them running. Lubricants today must be able to handle higher loads, higher temperatures, extend component operating life and improve productivity. At the same time, they must also eliminate or minimize airborne particle and mist generation which could fog optics or contaminate wafers.

For more than 50 years, Nye has been working with NASA and leaders in the commercial aerospace industry, qualifying lubricants for mission critical components while addressing problems like outgassing, contamination, and starvation. Outgassing reduces the effectiveness of a lubricant and can contaminate nearby components.

Much of this research is now paying off in other industries where Nye is applying this technology to design lubricants for uses in components and sub-assemblies for cleanrooms, laboratories and semiconductor fabrication facilities, both in vacuum and non-vacuum applications. Nye has recently expanded its product line to offer a full complement of lubricants for high vacuum, clean room and vacuum pump applications.

The Right Lubricant for the Right Application — NyeTorr[®], NyeClean[™] and NyeVac

NyeTorr[®] is a unique line of lubricants designed for the rigorous demands of the Semiconductor Production Environment. These products have been developed with several key parameters in mind: Low Outgassing, High Temperature Stability, Aggressive Chemical Resistance, Wear Protection, and Cleanliness. The raw materials used in NyeTorr[®] formulations are tightly controlled on a molecular level to limit the Vapor Pressure, Outgassing, and Contamination. Nye tests and certifies the vapor pressure of each batch to guarantee that the vapor pressure on the label matches the actual vapor pressure of the lubricant. Additionally, all NyeTorr[®] lubricants are subjected to a proprietary "Ultrafiltration Process" which removes microscopic particulates and homogenizes agglomerated thickeners.

The **NyeClean[™]** line has been developed with its focus on a wide range of general purpose applications in lower vacuum cleanroom environments. In this product line, you will find the broadest range of lubricants developed for motion control applications like bearings, linear guides, and ball screws. Some of the benefits of the NyeClean[™] product line include Low Particle Generation, Wear Prevention and Low Torque.

The **NyeVac** product line has been designed with Vacuum Pumps in mind. The focus has been on Turbomolecular, High Vacuum, and Diffusion Pumps as well as Vacuum Sealing applications. The benefits of this line include products designed to meet high speed ratings, low back-streaming (in Diffusion Pumps), Low Wear and Low Torque. We strictly control the raw materials in this line to reduce contamination and limit the Vapor Pressure for critical applications.

Comparative matrix of Nye product lines for the semiconductor industry

	<i>Ultrafiltered</i> (<300 particles/cc, $35\ \mu\text{m}$)	<i>High Temperature</i> (capable of $> 175^\circ\text{C}$)	<i>Wear Resistance</i>	<i>Low Outgassing</i> (passing ASTM E-595 Result)	<i>Chemically Inert</i>	<i>Low Particulate Generation</i> (Class 100 Cleanroom capable)	<i>Low Vapor Pressure</i>	<i>Very Low Starting Torque</i> ($<200\ \text{g}\cdot\text{cm}$)	<i>Vacuum Capabilities</i>
NyeTorr 5200	■		■	■		■	■		★★★★★
NyeTorr 5300	■	■		■	■	■	■		★★★★★
NyeTorr 5350	■	■	■	■	■		■		★★★★★
NyeTorr 5380	■	■		■	■		■	■	★★★★★
NyeClean 5011			■					■	★★
NyeClean 5011A			■						★★
NyeClean 5023			■			■			★★
NyeClean 5033F		■	■			■			★★★
NyeClean 5067		■			■		■		★★★
NyeClean 5077		■	■	■	■		■	■	★★★★★
NyeClean 5087		■		■	■			■	★★★★★
NyeClean 5088		■		■	■		■		★★★★★
NyeClean 5097		■		■	■	■	■	■	★★★★★
NyeClean 5097R		■	■		■			■	★★★
NyeVac 9720			■	■			■		★★★★★
NyeVac 9721			■				■	■	★★★
NyeVac 9724			■	■			■		★★★★★