NyeClean® 5057: REACH-Compliant In-Vacuum Grease

Nye Lubricants recently developed NyeClean® 5057, a PTFE thickened, medium viscosity, completely fluorinated grease. 5057 will replace a heritage semiconductor/in-vacuum lubricant that was recently discontinued after the introduction of new PFOA regulations.

Clean, Compliant Grease

NyeClean® 5057 is recommended for use in vacuum environments and was formulated specifically for bearings within semiconductor manufacturing equipment that require a durable and clean lubricant. NyeClean® 5057 is an inert grease that demonstrates excellent thermal and chemical stability, while also being resistant to solvents. NyeClean® 5057 complies with Annex XVII of REACH Regulation (EC) No. 1907/2006 and its amendments for Perfluorooctane sulfonates (PFOS) content (Formerly Directive 2006/122/EC).

This new grease was formulated using a unique perfluoropolyether (PFPE) base oil that remains stable over a wide temperature range (-50°C to +250°C) to accommodate demanding in-vacuum and environmental conditions. This base oil is characterized by a unique polymeric stability when in contact with a variety of metals at high temperatures.

Properties	Test Conditions	NyeClean® 5057	Test Method
Chemistry	-	PFPE / PTFE	-
Temperature Range	-	-50 to 250°C	-
Kinematic Viscosity	40°C	192 cSt	ASTM D445
NLGI Grade	-	2	ASTM D1403

Properties	Test Conditions	NyeClean® 5057	Test Method
Oil Separation	24 hrs, 100°C	5.80 wt%	ASTM D6184
Evaporation	24 hrs, 100°C	0.00 wt%	ASTM D972
4-Ball Wear	1 h, 1200 rpm, 75°C	20 kgf= 0.44 mm 40 kgf =1.15 mm	ASTM D2266
Microscopic Particulate Contamination	10-34 µm	<250 particles/cc	FED-STD-791 Method 3005.4

Meeting REACH Requirements

Thickened with a unique Polytetrafluoroethylene (PTFE) synthetic polymer, NyeClean® 5057 improves the friction, wear and energy consumption in the components where this lubricant is used. NyeClean® 5057 was validated using an exhaustive testing protocol to ensure that this new grease complies with the strict new regulatory statues.

Under REACH legislation passed in June 2017, products sold to or manufactured within the European Union will be limited to 25 parts per billion (ppb) of PFOA and its salt concentrations. All manufacturers are expected to fully comply by July of 2020 and there has been a push from healthcare, environmental, and other organizations to pass similar legislation in the United States. In fact, in February 2020, the SEMI International Standards Program introduced a new standard for the practice of restricting the use of PFOA, its related compounds, or their salts.

In order to properly certify to these new regulations, Nye contracted a respected independent laboratory to test NyeClean® 5057 for PFOS content. The laboratory used solvent extraction followed by analysis using a High-Performance Liquid Chromatography-Mass Spectrophotometer (HPLC-MS). With a Permissible Limit of 50 parts per million (ppm), and with an Equipment Detection Limit of 0.025 ppm, the independent results for PFOS were “Not Detected: PASS.” The laboratory then tested for PFOA content using the same method for which NyeClean® 5057 also received a passing rating.

Sample Today

NyeClean® 5057 meets all of the operating requirements our semiconductor and in-vacuum customers are looking for while meeting REACH requirements to help manufacturers remain compliant. Applications for NyeClean® 5057 include cleanroom manufacturing, robotics, metrology equipment, LCD/OLED displays manufacturing, bearings, linear guides, and many others.

For samples, technical information, safety data sheets or additional information regarding NyeClean 5057®, Contact Us.