THE DESIGN ENGINEER'S GUIDE TO SELECTING A MOTION CONTROL GREASE

Lubricants engineered to minimize noise, vibration and wear while providing a quality feel.

Nye® Lubricants
Member of the FUCHS Group

WHAT CAN MOTION CONTROL GREASES DO?

ENHANCE THE QUALITY AND MECHANICAL PERFORMANCE OF YOUR DESIGN

How Does Motion Control Grease Work?

When faced with the challenge of reducing cost without sacrificing quality, specialty lubricants can be useful tools in a design engineer's bag of tricks. Protection against wear and corrosion is the primary function of most lubricants, and motion control greases are no different. All greases are formulated by mixing an oil with a thickener. The thickener holds the oil in place until the grease is sheared, by a lever, gear or detent, for instance. Then the oil is released, to some degree, to lubricate the moving parts.

The difference between a standard grease and motion control grease is resistance to shear stress. Motion control greases are formulated with viscous (high-molecular weight) synthetic oils, giving them a high internal shear stress resistance. Nye offers motion control greases with several different base oils and thickeners including:

- PAO/Silica
- PAO/PTFE
- Silicone
- PFPE/PTFE

While the consistency of motion control greases can vary greatly, they tend to be tackier than standard greases, comparable to sticky peanut butter. It takes a degree of force to move through the grease. Since moving parts are partially separated by a thin layer of lubricant, there is little, if any noise and wear. Because motion control grease is tacky, components exhibit little to no movement when an applied force is removed. Additionally, different consistencies can build precise tolerances to provide a custom desired 'quality' feel.

Control Motion

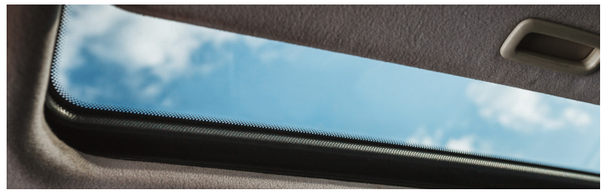
Nye offers a line of motion control greases that vary in shear resistance to assist engineers in controlling the precise torque and speed of their components. This can be useful in designs where even the slightest rotary motion can cause users to coast past the desired setting.

Provide A Tactile Feel

Shear resistance can also help control the precision of motion for a smooth quality feel. Lighter viscosity greases offer less resistance than higher viscosity greases. Nye recommends testing out several greases with different viscosities in order to choose which suits the feel you wish to achieve for your design.

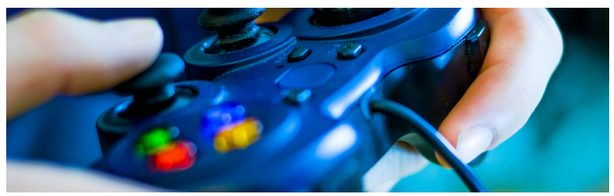
Minimize Noise & Vibration

Noise and vibration are often a result of friction between two components. A film of lubricant prevents two moving surfaces from coming in contact with one another to minimize noise. Preventing buzz, squeaks and rattles can improve the perceived quality of your design.



Reduce Friction & Wear

Motion control greases provide a barrier between moving components to reduce surface friction and prevent corrosion from occurring. This protects mechanical components from failure and ensures a pleasant user experience within haptic designs.



Case Study

Nye's ability to innovate, adapt, and develop solutions is as much in evidence today as it has been at any time during our history. For more than 40 years, Nye motion control greases have been used to improve the performance and perceived quality of mechanical devices.

In one case study, an automotive supplier reached out to Nye to find a grease that would lubricate their interior door handle. If not properly lubricated, components within the door handle experience friction during use which creates rattling that can be felt and heard by the passenger. Grease protects components and different viscosities allow engineers to control the torque and feel of handles. The supplier needed a lubricant to control the motion of the door handle to reduce the noise, vibration, and harshness that was emitted during use.

In addition to solutions for automotive components, Nye high-performance greases continue to be used to control motion and noise in medical, appliance, and consumer electronic applications. Nye greases are available in a variety of packaging sizes for both high-volume automated dispensing and small manual dispensing, such as field repair activities.

We have a track record of using our extensive technical knowledge to provide customer-focused solutions for demanding applications.

Automotive · **Medical** · **Appliance** · **Electronics**

Gears · **Lead Screws** · **Hinges** · **Potentiometers**

How to Select Your Motion Control Grease.

Nye Lubricants has a complete line of motion control greases designed with different chemistries, viscosities, and temperature properties. Selected products from Nye's more than 50 motion control grease offerings are shown below. Experimental and custom formulations are available upon request.

PAO/Silica — Resist displacement from plastic or metal surfaces and are suitable for moderately low temperature applications.

PAO/PTFE — Exhibit excellent shear stability for high load applications and are compatible with most plastics and elastomers.

Silicone/PTFE — Suitable over a wide operating temperature, and compatible with most plastics and elastomers.

PFPE/PTFE — Excellent shear stability for high load applications, used in extreme environments, and compatible with most plastics and elastomers.

PAO/Silica	Temperature Range	NLGI Grade (ASTM D217)	Viscosity Index (ASTM D2270)	Dynamic Viscosity (CTM-68) 50 s^{-1}	Tack Scale (CTM-90) (1 low, 5 high)
NyoGel® 774VLF	-50 to 120 °C	2	219	20 Pa•s	1
NyoGel® 774H	-20 to 120 °C	2	289	46 Pa•s	3
NyoGel® 774VH	-10 to 120 °C	3	323	105 Pa•s	4

PAO/PTFE	Temperature Range	NLGI Grade (ASTM D217)	Viscosity Index (ASTM D2270)	Dynamic Viscosity (CTM-68) 50 s^{-1}	Tack Scale (CTM-90) (1 low, 5 high)
Fluorocarbon Gel 868L	-40 to 125 °C	2	251	17 Pa•s	2
Fluorocarbon Gel 868	-40 to 125 °C	2	280	30 Pa•s	3
Fluorocarbon Gel 868VH	-20 to 125 °C	3	333	64 Pa•s	5

Silicone/PTFE	Temperature Range	NLGI Grade (ASTM D217)	Viscosity Index (ASTM D2270)	Dynamic Viscosity (CTM-68) 50 s^{-1}	Tack Scale (CTM-90) (1 low, 5 high)
Fluorocarbon Gel 880	-40 to 200 °C	2	658	38 Pa•s	3
Fluorocarbon Gel 891-V1	-40 to 200 °C	2	770	143 Pa•s	5
Fluorocarbon Gel 835C	0 to 200 °C	-	809	239 Pa•s	5

PFPE/PTFE	Temperature Range	NLGI Grade (ASTM D217)	Viscosity Index (ASTM D2270)	Dynamic Viscosity (CTM-68) 50 s^{-1}	Tack Scale (CTM-90) (1 low, 5 high)
Uniflor™ 8172	-45 to 225 °C	2	120	17 Pa•s	1
Uniflor™ 8322	-20 to 250 °C	3	138	35 Pa•s	2

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