Nye®

Lubenotes:

Design Engineer's Guide to Selecting a Lubricant

Impregnating Oils for Sintered Bearings

Sintered powdered metal or "porous" bearings, which are impregnated with lubricating oil through a vacuum process, are generally used as an alternative to expensive rolling element bearings. In addition to impregnation, a small reservoir, usually an oil-soaked felt pad, is sometimes placed adjacent to the bearing to augment oil supply and thus extend bearing life.

In operation, heat from the shaft's rotation draws oil from the bearing to the bearing-shaft interface. As the oil is forced from the loaded zone, it is reabsorbed through capillary action into the bearing. Some hydrodynamic lubrication (where the shaft actually rotates on a film of oil) may take place. More commonly, however, porous metal bearings operate under mixed film or boundary lubrication conditions.

Nye impregnating oils are designed to promote film formation, to counteract the otherwise lubricant starved, mixed film and boundary conditions which are common with porous metal bearings. They are also engineered to meet especially demanding specifications, such as exceptionally low starting torque, heavily loaded applications, extreme temperatures, resistance to chemicals, fuels and solvents — whenever component quality and long life is the primary design objective.

Advantage of specially engineered sintered bearing oils. The quality of the impregnating oil determines the life and performance of countless rotary designs that use sintered bearings — in automotive components, computer peripherals, exercise equipment, appliances, and all types and sizes of electric motors. Put simply, if the oil oxidizes, evaporates or migrates, the device fails — which makes the selection of the impregnating oil as critical as any other design decision.

More and more OEMs are recognizing the price-performance advantage of specially engineered, synthetic impregnating oils. With much wider useful temperature ranges and better oxidation resistance than petroleum products, synthetic oils with special film-forming additives deliver improved performance and longer life for only a fractional increase in unit bearing cost. Their stability and longer life may also offer a design advantage, permitting smaller bearings where larger bearings might otherwise be specified primarily to compensate for the higher oxidation and evaporation rates of petroleum oils.

Oil migration, a particular problem when nearby, sensitive components are threatened with contamination, can be prevented with NyeBar® fluorocarbon barrier films. Low surface energy and non-wettable, they are applied to the shaft to prevent oil creep.

Selecting the right lubricant for your application. Following is a partial list of popular Nye lubricants for sintered metal bearings. Additional oils and greases are available to meet a wide range of application requirements. For technical specifications, evaluation samples, questions about any Nye products, or to discuss a lubricant *custom-designed* for your application — call us at (508) 996-6721 or visit our web site at www.nyelubricants.com.

Contact Nye at 1.508.996.6721
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The SmartGrease™ *Company*

Sintered Bearing Oils	Temp Range (°C)	Viscosity @40°C	Application Focus
Nye Synthetic Oil 132B	-60 to 120	20 cSt	PAO, plastic compatible, light viscosity oil for improved low torque start-up.
Nye Synthetic Oil 181B	-40 to 125	60 cSt	PAO, plastic compatible, medium high viscosity oil; most commonly used viscosity for sintered bearings.
Nye Synthetic Oil 188B	-40 to 125	105 cSt	PAO, plastic compatible, high viscosity oil for improved load bearing characteristics.
Nye Synthetic Oil 310B	-20 to 125	500-560 cSt	High viscosity PAO with additives to reduce friction and wear in sintered iron bearings.
Nye Synthetic Oil 634B*	-40 to 150	35 cSt	Light viscosity polyolester-based oil with copper pacifier and anti-wear additives for low torque applications.
Nye Synthetic Oil 605*	-40 to 150	60 cSt	Medium viscosity, polyolester oil; excellent lubricity; contains copper pacifiers and load bearing additives.
Nye Synthetic Oil 590*	-40 to 175	82 cSt	Medium viscosity polyester oil; excellent wide-temperature serviceability and corrosion protection.
UniFlor™ 8910	-75 to 225	90 cSt	Medium viscosity, exceptional lubricity and chemical inertness; low volatility and wide-temperature capability.
UniFlor™ 8920	-65 to 250	150 cSt	High viscosity, good film strength, exceptional lubricity and chemical inertness, very wide temperature capability.

* *Ester-based oils may adversely affect some plastics, such as ABS, polycarbonates, and polyphenylene oxides. If compatibility questions arise, contact Nye Lubricants prior to lubricant selection.*

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