



Dental Handpiece Lubricants 400 & 600

High Speed and Precision Bearing Oils

Few applications in the health care industry challenge a bearing lubricant more than the high-speed dental handpieces used to drill, shape, and polish teeth.

Bearing size and speed is one challenge. Dental handpieces contain a turbine with precision bearings, whose tiny steel or ceramic balls measure about one millimeter (1,000 microns) in diameter. They travel up to 500,000 rpm, corresponding to more than 8,000 revolutions per second. Properly lubricated, the balls travel around the raceway on a thin film of oil, which prevents direct contact with the raceway. If the oil is not properly filtered, however, the speeding balls are an accident waiting to happen. If a ball hits even a microscopic particle in the oil at high speed, the oil film will likely rupture and some scarring of the ball or raceway is likely. Over time, these collisions create unwanted noise, accelerated wear, and shorten the operating life. To optimize the performance of precision bearings, Nye recommends ultrafiltration of the oil, a process that can filter out all particles larger than 50, 25, 10, 5, or even 1 micron — depending on the cleanliness level required. (For scale, a grain of beach sand is about 600 microns).

Another challenge faced by handpiece lubricants is temperature. In the early 1980s, when sterilization protocols became more stringent in response to the HIV virus, dental offices began to autoclave handpieces. Today, after each patient, the handpiece is flushed with a cleaner, dried, lubricated, and sterilized at high temperatures. A good synthetic hydrocarbon oil can withstand the temperature and pressure of the autoclave procedure. Nye offers several oils, including Nye DHL-400 and DHL-600, tested to 150°C, that are specified by OEMs and sold under private labeling to dental practices.



High-speed dental handpieces use synthetic hydrocarbon oils in the turbine bearings. Typically, the bearings are re-lubricated with oil and placed in an autoclave after each use.

Typical Properties

Lubricant Properties	DHL-400	DHL-600
Temperature Range	-40 to 150°C	-40 to 150°C
Base Oil	PAO	PAO
Kinematic Viscosity (100°C)	4 cSt	6 cSt
Kinematic Viscosity (40°C)	16 cSt	30cSt
Color of the oil	Clear	Clear
Pour Point (ASTM D-97)	-63°C	-53°C
Flash Point (ASTM D-92)	238°C	272°C
Food Grade Registration	NSF H-1 #133067	NSF H-1 #133066

Nye also manufactures and commercializes other **oils and greases** for the dental and medical industries. Additional lubricants are available to meet a wide range of application requirements. For further information, technical specifications, evaluation samples, questions about any Nye product, or to discuss a lubricant custom-designed for your application - call us at +1.508.996.6721 or visit us at www.nyelubricants.com.



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