

Applications

ArchOil®'s nanoborate Friction Modifier technology has applications in engines, gear boxes, heavy machinery, chains, hydraulic systems, wire rope, firearms, and wherever else a reduction in metal on metal friction or corrosion is needed.

Summary

Nanoborate solid boundary lubricant technology successfully addresses the three major lubrication challenges- friction, corrosion and extreme pressure, eliminating the need for toxic and older additive technologies like zinc, chlorine and phosphorous, etc. Nanoborate lubrication technology increases the efficiency of fluid systems to their highest operating potential.



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Nanoborate Lubrication Technology

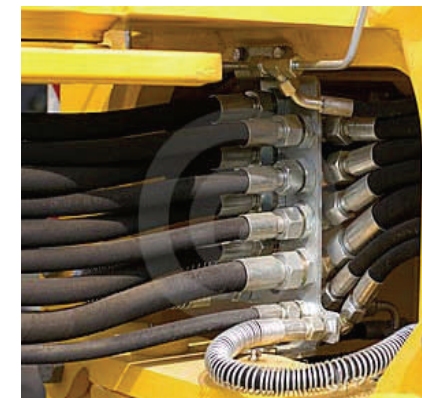
ENGINES



GEARBOXES



HYDRAULICS



BEARINGS



The Science of Nano-Lubrication



Boron Nano-Particle Lubrication Technology

The Evolution of Boron as a Lubricant

The value of boron in solid boundary lubrication was discovered in 1990 at the U.S. Dept of Energy's Argonne National Laboratory. Dr. Ali Erdemir's ground breaking discoveries proved boron to be the best performing anti-wear/extreme pressure (AW/EP) agent, vastly outperforming the chemistries presently deployed in oil as a solid boundary lubricant.

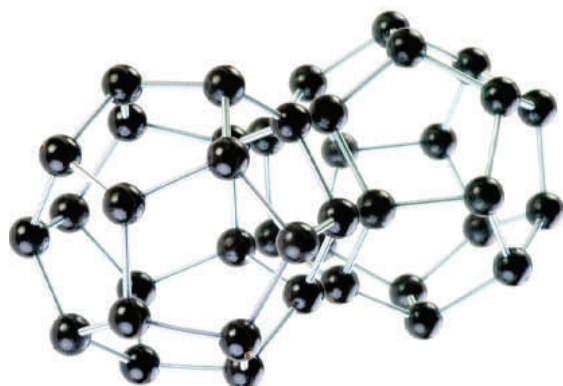
Building on their initial work, chemists have forged ahead with a new approach incorporating boron-containing nanoparticles in an ester matrix to produce even more superior results than yielded in initial boron applications. New potassium borate nanoparticles represent the ultimate AW/EP additive chemistries for greases and oils, increasing performance while also eliminating toxic and carcinogenetic additives.

Boron nanoparticles are dispersed into the fluid system and chelate evenly on the metal filling in even the smallest of asperities. Surface friction coefficients have been measured at 0.037, almost half that of other boron-containing lubricants, and a fraction of traditional non-boron lubricants. Nanoborate particles achieved loads of up to 4,000 lbs, 3 times greater than previous boron lubricants, and many times more than traditional non-boron lubricants.

Nanoborate lubricants represent the most protective solid boundary lubricants available. They offer the lowest surface friction coefficients with tremendously high extreme pressure and anti-corrosion protection.



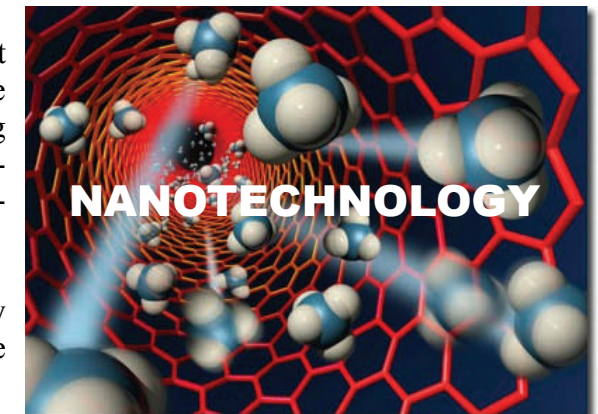
Nanoborate technology is a high rated solid boundary lubricant for friction reduction and extreme pressure, delivering outstanding protection against wear.



FROM MACRO TO MICRO TO NANO

With all of the greatly enhanced benefits it offers, nanotechnology has become one of the fastest growing scientific and engineering disciplines. New nano advancements in bio-science, medicine, engineering, pharmacology, and material science fill the news.

Nano technology gives scientists the ability to work and manipulate materials at the atomic and molecular level.



A nanometer is a unit of measurement that is one billionth of one meter. To give that some perspective- a nanometer is to a golf ball, what a golf ball is to the earth.

What Does Nanoborate Mean for Lubrication ?

Work on materials at the nano level enables chemists to transform and accentuate the highest level of its characteristics. For the past few decades boron has become well recognized among tribologists for its tremendous strength, slipperiness and anti-corrosion properties. When manipulated at the nano level all of the benefits characteristic to boron become even more amplified.

The main purposes of lubrication are to; reduce friction and wear; extend component life; and to dissipate frictional heat. Nanoborate technology reduces friction to coefficients of 0.037, half again the friction coefficient of 'micro boron', and a fraction of traditional lubricants like zinc, phosphorous and other additives presently used in popular oil and grease formulations. Nanoborate also has several times the load capacity of both 'micro boron' and traditional chemistries, testing at up to 4000 lbs. on the Falex Pin & Vee Block test.

Once the nanoborate friction modifier is introduced into the oil it disperses and excites the molecules in the oil, turning it into an extremely efficient high performance lubricant. Friction and wear are reduced at rates nearing 90%. Nanoborate greatly exceeds the challenges presented by today's tightened fluid system tolerances.

Significant reductions in friction also has the highly desirable side effect of increasing the system's fuel efficiency. Nanoborate lubrication reduces the amount of energy required to operate the system.

Nanoborate lubrication means reduced wear, extended equipment life and increased fuel efficiency.