

AMSOIL®

The First in Synthetics®

SAVE MONEY With AMSOIL



What Are Synthetic Lubricants?

Engines, transmissions and other mechanical systems contain hundreds of moving parts. Though the metal surfaces of these parts look smooth, they are actually full of microscopic peaks and valleys. When the peak of one surface touches its mating surface, it causes wear. Wear may lead to costly component damage or failure. Wear reduction and failure prevention are the primary functions of lubrication.



Refined Oils

Conventional oils – the oils most people are familiar with – are refined from crude oil. Refining is a process of physically separating light oil components from heavy ones.

Crude oil contains a full range of different kinds of molecules. Many are similar in weight but not in structure. The refining process cannot distinguish such molecules, so a wide assortment of molecules is present in a finished lubricant made from crude oil stocks.

Many crude oil molecules are not beneficial to the lubrication process. For example, paraffin causes refined lubricants to thicken and flow poorly in cold temperatures. Molecules containing sulfur, nitrogen and other elements invite the formation of sludge and other by-products of lubricant breakdown, especially in high-temperature applications. Sludge and breakdown by-products significantly increase wear rates.

The different shapes of the assorted molecules of refined lubricants means lubricant surfaces are irregular at the molecular level. As lubricant layers flow across one another during the lubrication process, these irregularities create friction, which consumes power, reduces fuel efficiency and increases heat and wear.

Synthetic Lubricants

Synthetic lubricants are chemically engineered from pure chemicals rather than refined from crude oil. That gives them significant advantages over refined oils.

Pure

The base stocks from which synthetic lubricants are made contain no sulfur, nitrogen or other elements that invite the formation of sludge and other products of lubricant breakdown. Synthetic lubricants can be used in higher temperatures than refined lubricants without breaking down. Their resistance to breakdown also allows them to be used longer than refined lubricants can be used. Lubricated systems stay cleaner and last longer with synthetics.

Uniform

The base stocks from which synthetic lubricants are made feature uniform and smooth molecular structures, which ensures low friction as lubricant layers slide across one another. Reduced friction increases energy through-put for greater fuel efficiency and power, and reduces heat and wear for longer equipment life.

Molecular uniformity also helps synthetics resist thinning in heat and thickening in cold, which helps them protect better than refined oils over a system's operating temperature range and helps ensure secure sealing.

Designable

Many different kinds of base stocks may be used to create synthetic lubricants, allowing a synthetic to be designed for virtually any application. Some base stocks are ideal for use in extremely cold environments, others are perfect for use in extreme heat. Some are extremely safe in applications in which refined lubricants pose a fire or explosion hazard. Refined oils simply do not offer the design flexibility synthetics offer.

The designability of synthetics also allows them to be tailored very specifically to the needs of everyday applications, such as automotive engines, commercial equipment or industrial machinery. That specificity helps ensure long life and peak power, performance and fuel economy from the lubricated system, as well as extended lubricant life.



Why Are AMSOIL Synthetic Lubricants the Best?

As a jet fighter squadron commander Lieutenant Colonel Albert J. Amatuzio had ample opportunity to witness synthetic lubricants in action. These oils are used exclusively in jet engines because of three extraordinary performance characteristics: an ability to reduce friction and wear on engine components, an ability to function dependably at severe temperature extremes and an ability to withstand rigorous and lengthy engine operation without chemical breakdown.

Recognizing that these same benefits would prove invaluable in combustion engines, Amatuzio began conducting serious research in 1963. By 1966 he had formulated a synthetic motor oil and put it to use in vehicles in northern Minnesota. Throughout the late '60s Amatuzio continued his research and development and sold commercially available synthetic oils under a variety of names. In 1970 he incorporated his own name into a commercially sold product called AMMOIL. In 1971 this product name was changed to AMZOIL and it continued to be sold commercially. The true milestone came in 1972 when AMZOIL became the first synthetic motor oil in the world to meet American Petroleum Institute criteria. The new lubricant performed like no other before it. When the first can appeared on the market in 1972, it signaled the birth of an entire industry. Shortly thereafter, AMZOIL became AMSOIL and the company's products went on to expand the boundaries of lubrication science and redefine the performance possibilities of modern machinery and engines.

High-Temperature Protection and Performance

AMSOIL synthetic lubricants are much more stable in high temperatures than are refined oils and other synthetic oils. Their superior heat stability reduces the rates of oil consumption, lubricant breakdown and lubricant oxidation, which keeps oil consumption low; equipment clean, protected and running right; and extends lubricant life.

Cold-Temperature Protection and Performance

AMSOIL synthetic lubricants remain fluid in temperatures far below zero, allowing dependable engine start-up, fast lubrication, dependable protection and maximum fuel economy in severe cold operation.



Increased Efficiency

AMSOIL synthetic lubricants are superior to refined oils and other synthetic oils in reducing friction, helping lubricated systems use fuel energy for work, not for overcoming drag. Superior friction reduction, as well as lower volatility rates, also helps keep exhaust emissions low.

Longer Engine and Equipment Life

AMSOIL synthetic lubricants' heat stability and friction-reducing ability keep wear rates low, which helps increase the time to first teardown, increases the interval between teardowns and increases overall equipment life.

Extended Lubricant Drain Intervals

AMSOIL synthetic lubricants offer up to eight times the service life offered by refined lubricants, and sometimes even more. The long life of AMSOIL synthetic lubricants reduces costs, downtime, waste and environmental damage.

Product Line

AMSOIL manufactures synthetic lubricants, advanced filtration systems, fuel additives and coolant for virtually every commercial, industrial and automotive application.

Quality Control

AMSOIL synthetic lubricants are manufactured from top-quality synthetic base stocks and performance additives according to a stringent quality control protocol in computer-controlled AMSOIL manufacturing facilities. AMSOIL synthetic lubricants may be counted on to deliver the same top-quality performance and protection every time they are used, no matter where in the world they are purchased.

Experience

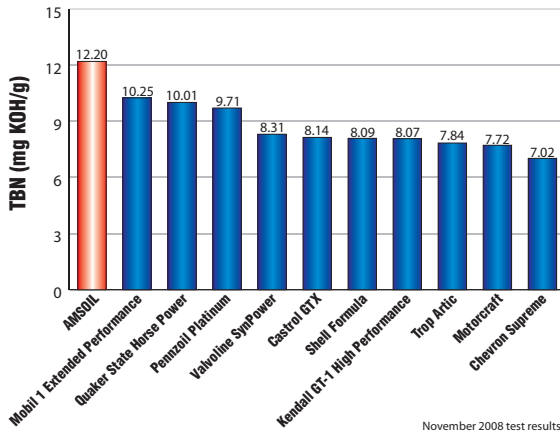
AMSOIL formulated the first API-qualified motor oil in the world and has more experience formulating synthetic lubricants than any other manufacturer in the world. AMSOIL leads the industry in product quality and innovation.

- **Quality**
- **Performance**
- **Protection**

AMSOIL synthetic motor oils are developed with the use of numerous laboratory and field tests. These tests help to determine the formulation that will best suit the needs of each individual application. After AMSOIL has formulated an oil to the highest possible quality, the company often compares its oils to competing products to demonstrate AMSOIL synthetic motor oils' superiority. The tests featured here compare AMSOIL Synthetic 10W-30 Motor Oil with other 10W-30 motor oils on the market. All tests are ASTM certified and readily show AMSOIL has no equal.

Total Base Number

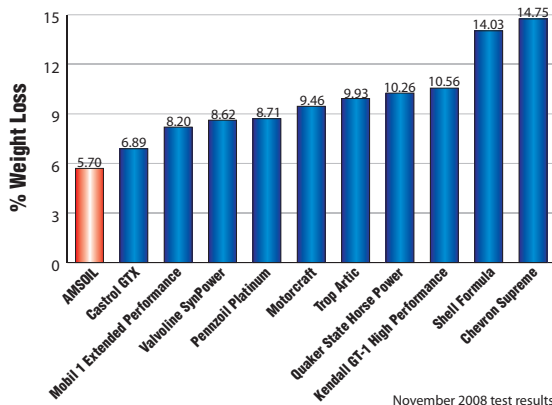
(ASTM D-2896)



The high TBN of AMSOIL synthetic motor oil allows it to effectively combat wear-causing contaminants and acids, providing superior protection and performance over extended drain intervals.

NOACK Volatility

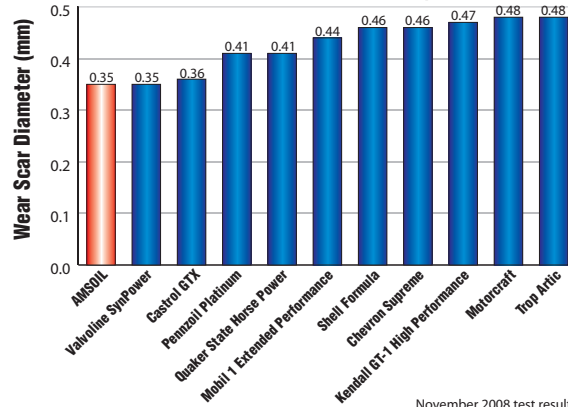
(ASTM D-5800)



The extremely low volatility of AMSOIL synthetic motor oil allows it to maintain its superior protective and performance qualities throughout extended drain intervals, even when faced with severe operating temperatures. In addition, oil consumption and emissions are minimized and fuel efficiency is maximized.

Four-Ball Wear

(ASTM D-4172)
40 kg, 75°C, 1800 RPM, 1 hour
The smaller the wear scar, the better the protection

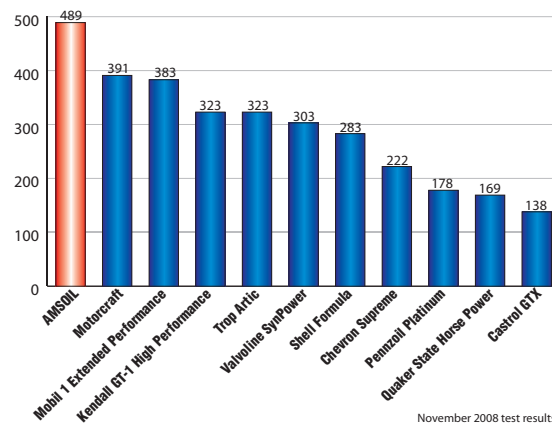


November 2008 test results

AMSOIL synthetic motor oil provides unsurpassed protection against engine wear. Equipment life is extended, and repairs, downtime and expenses are reduced. The smaller the scar, the better the protection.

Thin Film Oxygen Uptake Test

TFOUT (ASTM D-4742)

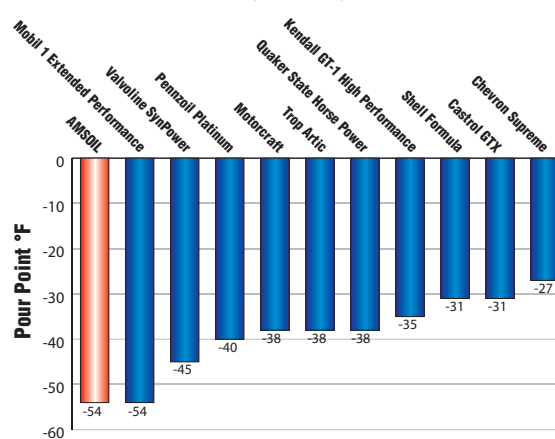


November 2008 test results

The superior oxidation stability of AMSOIL synthetic motor oil allows it to effectively resist the formation of engine deposits and sludge, keeping engines running clean and efficient and extending oil life. It also resists thickening, maintaining its superior wear protection and lubricating properties and maximizing fuel efficiency.

Pour Point

(ASTM D-97)



November 2008 test results

AMSOIL synthetic motor oil's low pour point allows it to maintain its fluidity in extremely low temperatures, reducing drag on moving vehicle parts, providing quick, essential lubrication and easing startup in cold temperatures.

SAVING Businesses MONEY

AMSOIL Products Save Money

The uninformed have always assumed that AMSOIL synthetic lubricants were more expensive than conventional products. It is true that the initial cost is higher than most petroleum-based products, but an investment in AMSOIL synthetic lubricants is an investment in your business. AMSOIL saves businesses money by improving fuel economy, reducing maintenance costs and downtime, and extending drain intervals.

Reduced Maintenance

Because AMSOIL lubricants are superior to conventional products, equipment maintenance is needed less often. The unsurpassed protection, cleaning and cooling properties of AMSOIL keep moving parts looking and working like new, reducing equipment malfunctions and failures.

Extended Drain Intervals

Extended drain intervals are key to improving bottom lines. Changing fluids less often means buying them less often. It also means equipment is in the shop less often, reducing maintenance needs and downtime and improving efficiency.

Less Downtime

Less maintenance and extended drains mean less downtime, and less downtime means equipment is working more often and getting more done. It also means less time spent working on equipment when there are other things to be done.

Longer-Lasting Equipment

AMSOIL products improve equipment's durability because they provide superior protection. Less wear, stress and strain on moving parts allows equipment to last longer, reducing replacement costs.

Better Fuel Economy

Fuel economy is becoming more important with each passing year. Gas and diesel prices keep rising, putting

a major strain on businesses that rely on vehicles and heavy equipment in their daily operations. AMSOIL synthetic lubricants improve fuel economy by allowing moving parts to move more freely, using less energy and creating less friction than when conventional lubricants are used.

The use of AMSOIL synthetic motor oil, gear lubes and transmission fluids can have a profound impact on fuel economy. Industry tests demonstrate an average conservative decrease in fuel consumption by 2 to 5 percent by switching to synthetic lubricants. Many AMSOIL customers report even larger gains in fuel economy. Doesn't seem like much? Imagine a fleet of 100 class 8 vehicles running an average 120,000 miles per year at an average 6.5 mpg with diesel fuel at \$2.25 a gallon. Using those numbers, the fleet spends \$4,153,846.16 on fuel annually. A switch to AMSOIL products improves the fleet's mpg by 4 percent, reducing fuel costs to \$3,994,082.84. That's a savings of \$159,763.32, enough for 71,006 gallons of fuel.

Waste Oil Disposal

Extended drain intervals also prevent the disposal of additional waste oil. Disposing of used oil can be costly and barrels of used oil take up a great deal of space in the shop. A fleet of 60 vehicles using conventional oil and conventional oil change intervals produces 1,080 gallons of waste oil every year. By switching to AMSOIL, that same fleet would produce only 360 gallons of waste oil per year. Less waste oil means lower disposal costs, more shop space and a cleaner environment.

Money Saved

The most important aspect of these benefits is that they save businesses money. Better fuel economy, reduced maintenance, longer-lasting equipment, less money spent on oil and less waste oil all provide significant savings.

- **Convenience** • **Improved Mileage** • **Reduced Maintenance** • **Reduced Downtime** • **Extended Drain Intervals** • **Save Money**

Gasoline Engine Case Study With Guardian Pest Control

See how switching to AMSOIL has saved one company tens of thousands of dollars per year.

Guardian Pest Control is a family-owned and operated firm located in Duluth, Minn. The company offers programs and services to residential, commercial and industrial clients that include integrated pest management, organic pest management, rodent control, bird management and many more.

Guardian's fleet of over 60 vehicles provides service to urban and rural areas in Minnesota, Wisconsin, Iowa, Michigan's Upper Peninsula and the eastern Dakotas.

The varied levels of severe service Guardian's trucks face on a daily basis made them an obvious choice for a field study. The Gasoline Engine Case Study With Guardian Pest Control (G2244) provides details on the study and demonstrates how switching to AMSOIL synthetic motor oils has saved Guardian Pest control tens of thousands of dollars on a yearly basis.





- **First** to develop an API-rated 100 percent synthetic motor oil.
- **First** to introduce the concept of extended drain intervals with a recommended 25,000-mile/12-month drain interval.
- **First** to produce synthetic motor oils for diesel engines.
- **First** to produce synthetic motor oils for racing engines.
- **First** to produce synthetic motor oils for turbo engines.
- **First** to produce synthetic motor oils for marine engines.
- **First** to manufacture synthetic gear lube for automotive use.
- **First** to manufacture a 100:1 pre-mix synthetic 2-cycle oil.
- **First** to manufacture a synthetic automatic transmission fluid for automotive use.
- **First** to manufacture a full-synthetic cartridge-style oil filter.

*First in History
First in Quality*

The First in Synthetics®

AMSOIL products and Dealership information are available from your local AMSOIL Dealer.

