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 mean 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 don't serve a designed purpose. Synthetic lubricants resist breakdown better in higher temperatures than refined lubricants. Their resistance to breakdown also allows them to be used longer than refined lubricants. Lubricated systems stay cleaner and can 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. 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 So Good?

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. They are engineered for superior heat stability, which reduces the rates of oil consumption, lubricant breakdown and lubricant oxidation and helps keep 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.

Promotes Increased Efficiency

AMSOIL synthetic lubricants are superior to refined 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.

Helps Extend Engine and Equipment Life

AMSOIL synthetic lubricants' heat stability and friction-reducing ability help keep wear rates low, which in turn can increase the time to first teardown, increase the interval between teardowns and increase 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 impact.

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 extensive experience formulating synthetic lubricants. AMSOIL is an industry leader in product quality and innovation.

How Do AMSOIL Products Stand Up?

Increased Fuel Economy

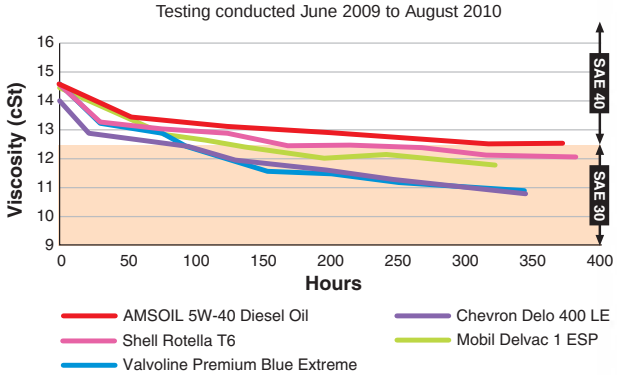
Testing done in accordance with the SAE J1321 (TMC RP-1102) In-Service Fuel Economy Test Procedure proves AMSOIL synthetic engine and drivetrain lubricants increase fuel economy in diesel trucking applications. AMSOIL Premium API CJ-4 5W-40 Synthetic Diesel Oil, AMSOIL SAE 50 Long-Life Synthetic Transmission Oil and AMSOIL 75W-90 Long Life Synthetic Gear Lube were installed in a Kenworth® T800B truck pulling a 53' trailer. Several test runs completed simultaneously with a nearly identical truck and trailer using conventional fluids indicate the vehicle using AMSOIL realized a **6.54 percent increase in fuel economy.** See the Diesel Fleet Fuel Economy Study Brochure (G2904) for complete details.

Excellent Shear Stability

AMSOIL Premium API CJ-4 5W-40 Synthetic Diesel Oil and four other oils were consecutively tested in the same International 7400 refuse hauler practicing drain intervals of 300-plus hours. The vehicle was subjected to severe-service duty hauling up to 22,000 pounds of refuse in 12-hour shifts. All four competing oils sheared out of the intended viscosity range prior to 168 hours of operation. Excess viscosity loss impairs the oil's ability to maintain a strong lubricating film on engine parts, inviting accelerated wear and, ultimately, failure. AMSOIL Synthetic Diesel Oil, on the other hand, remained within grade even after 371 hours of heavy-duty, severe service. It provides excellent wear protection throughout extended drain intervals for maximum savings.

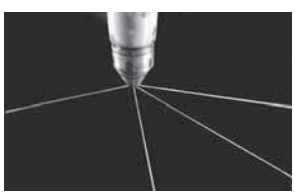
Viscosity @100˚C (ASTM D-445)

Testing conducted June 2009 to August 2010

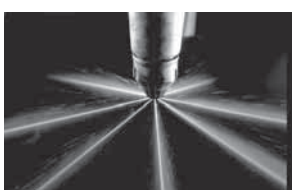


Restored Horsepower and Fuel Economy

By cleaning dirty injectors, AMSOIL Diesel Concentrate helps ensure an even spray pattern for improved fuel economy up to 5 percent, as tested with the Cummins L10 Injector Deposit test. Regular use enhances engine performance by keeping injectors clean, resulting in better fuel economy and restored horsepower.



Dirty Fuel Injector Spray Pattern



Clean Fuel Injector Spray Pattern

SAVING Businesses MONEY

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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 can help save businesses money by improving fuel economy, reducing maintenance costs and downtime, and extending drain intervals.

Reduced Maintenance

Because AMSOIL lubricants are engineered for superior wear protection, equipment maintenance is often needed less often. The excellent protection, cleaning and cooling properties of AMSOIL keep moving parts working properly, helping reduce 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 through 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.

Long-Lasting Equipment

AMSOIL products help 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. The AMSOIL Over-the-Road Trucking Package, for example, has been proven in industry testing to increase fuel economy 6.54 percent in diesel trucking applications (see inside flap). The savings for a fleet of 100 OTR trucks each averaging 120,000 miles per year are significant: Averaging 6.39 mpg (6 mpg + 6.54 percent) saves the fleet $499,389 each year on 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 100 trucks using conventional oil and conventional oil change intervals produces 9,600 gallons of waste oil every year.** By switching to AMSOIL and extending oil change intervals to three times OEM recommendations, that same fleet would produce only 3,200 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 can provide significant savings.

AMSOIL synthetic lubricants are formulated to:

- Increase Convenience
- Improve Mileage
- Reduce Maintenance
- Reduce Downtime
- Extend Drain Intervals
- Save Money

Commercial Account Testimonials

AMSOIL commercial accounts include national trucking companies, taxi fleets, police fleets, refuse hauling companies, landscaping businesses and more. To hear how some have realized significant cost savings using AMSOIL synthetic lubricants, visit www.amsoil.com/ca_testimonials or scan the QR code.

*Based on average U.S. on-highway diesel fuel price. Prices subject to change.

**Based on 120,000 miles per year/per truck; 10,000-mile oil change intervals; eight-gal. capacity.

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

AMSOIL

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