

Eastman Lands BP Jet Oil Biz

=====

Ester oils will attack most of the polymers unless they are viton based. Stick with the Sullube or Ultra Coolant. Since they do not have hydrocarbons there is no varnish to form. They are both PG fluids which in today's (2008) market are only sold in a single ISO, so no issues there.

PAO is more thermally stable than PG. Evaporation rate of Ester is higher than PAO and PG. So that oil consumption will be very high if you go for Ester.

=====

Neste isoalkane to be used in Avantherm's heat transfer fluids

Avantherm, a Swedish company specializing in Heat Transfer Media products, has started using Neste Renewable Isoalkane to produce the next generation, high-performance and more environmentally friendly products that will facilitate the transition to a fossil free society. Avantherm becomes one of the first companies in the world to market Heat Transfer Media produced from **renewable** raw materials.

"Neste is proud and happy to support Avantherm in launching new sustainable and high-performance renewable products for replacing fossil oils and chemicals," says Matti Lehmus, Executive Vice President of Neste's Oil Products Business Area. "This milestone is also an important step towards our strategic goal to develop business from non-traffic renewable products market," continues Lehmus.

"Avantherm's first line of products, sold under the Avantherm brand name, are Heat Transfer Media, among them a coolant to replace glycol. Soon transformer oil and release fluids will be launched, and development is progressing with several more products. Our products will not only reduce the environmental impacts but also are of a premium quality. They are sustainable and **biodegradable**, and also have a low sulfur and aromatic content, which is a specific concern to sensitive environments such as forestry and agriculture," says Stefan Dufva, CEO of Avantherm.

The chemical composition of Neste Renewable Isoalkane, according to the company, is comparable to the fossil equivalents, but it outperforms conventional fossil based products in terms of quality, performance and environmental impact. Due to its **fossil product like chemical composition**, it can be used exactly as its fossil equivalents. Neste is able to produce Neste Renewable Isoalkane utilizing company's proprietary NEXBTL technology at its refineries in Singapore, The Netherlands and Finland.

=====

[BorisZhmud](#)

In my opinion, **energy saving achieved with PAO is mostly attributed to lower viscosity** of finished products, and lower percent of polymeric viscosity modifiers, and not so much to molecular structure of PAO as such. There are a lot of speculations specifically about mPAO but I haven't yet seen any conclusive data proving such claims for equiviscous products (having the same v100, v40, HTHS yet different PAO/mineral ratio). Furthermore, PAO based formulations will nearly always contain some solubility boosters (esters, alkylated naphthalenes, OSPs) which add lubricity.

=====

[Jim Myers](#) Owner at Amsoil Synthetic Lubricants

Any equipment using a synthetic lubricants uses less energy. Do the 100s of different size and

shapes of the molecules in crude oil, there is already built in resistance when moving parts through it. A synthetic on the other hand is formulated in the laboratory by a chemist who controls the make up of the molecules, clones of each other, which gives a ball bearing effect, or slipperier, which reduces friction. Three benefits less heat, less wear and tear, and the wasted energy used in crude oil can now be transferred to getting the most efficient use of said piece of equipment. AN EDUCATED CONSUMER IS A SMART CONSUMER. www.fillupless.com

[Don McNeil](#) Industrial Sales - STLE Certified Lubrication Specialist at Apache Oil Company

More hype with no evidence. Group 3 base stocks produce almost identical results as PAO Synthetics. And when you say they use less energy please provide an actual example of an independent field test that produced any significant energy savings for the use of a PAO Synthetic compared to group 2 or 3 base oils! There is definitely a place for synthetics but to state that synthetics are the best choice for all applications is naïve and wrong!

[Gary H. Weinberg STLE-C.L.S.](#) Tribologist at Western Sierra Services Inc

That is a very good explanation of why synthetic lubricants are the way to go. Having spent 30 years with Mobil Oil and hearing about Mobil 1 and the processes involved it's refreshing to hear the correct explanation of why synthetics are a better choice.

[John Neale](#) Director at John Neale Ltd

Some synthetic base fluids have better lubrication like PAG and ester. However other synthetics in my experience offer no benefits in lubrication. There can be benefits due to structure in additive response, thermal and oxidative stability, flash point, solvency etc, but this differs for each synthetic base stock. Each application needs to be assessed and the best / most cost effective oil chosen, this may be a synthetic or it may be a group 2 or 3 oil.

[Jim Myers](#) Owner at Amsoil Synthetic Lubricants

John, I agree wholeheartedly. That is the reason depending on the intended application, the chemist chooses the best base stock. With crude oil the base stock remains the same. Sure there are light crude and heavy crude, but when all is said and done you're still dealing with many differing shapes and sizes of the molecules. There are some applications price and benefit realized isn't worth the investment. There have been many tests over the years that have proven my original statement. Every test is one that is approved by the American Society of Testing and Materials. (ASTM). In the last year AMSOIL has field trials done, both on Over The Road Trucks (OTR) and Stop and Go City Traffic, and the results have shown a 6.5% increase in MPG in OTR and in the Stop and Go a 3.15% increase. I receive a copy of Lubrication Magazine every month and over the past several years they have come to the conclusion, that in most cases benefits of using synthetic lubricants with reduce costs. Working for an Oil Company I'm sure you are well versed in the pour point and the flash point of a synthetic lubricant. The results are less drain on your battery every time you start your engine. With extended drain intervals tremendous savings can be achieved with TIME and MONEY. You can find a number of field trials AMSOIL has done by checking the Performance Tests tab on their website, www.amsoil.com. As I originally said any synthetic lubricant is better than crude oil based. So more power to those who have switched to any of the brands available.

[Don McNeil](#) Industrial Sales - STLE Certified Lubrication Specialist at Apache Oil Company

Actually - what you claim is not true. I said independent field tests not in house tests! Also all base stocks are not the same. I have never seen an independent test showing more than a 1% efficiency benefit in hydraulics or gear oil applications. The benefit in those applications is from improved oxidation stability and longer service life not energy savings. That is also why there are group 1, 2, and 3 base stocks. Not even all Group 3 base stocks are the same depending upon the refining and finishing process. Synthetics are great for many applications but conventional lubricants are also the best economic choice for a great many of the current applications, depending upon whether you are talking an automotive, commercial, or industrial application. Synthetics are not the best choice for

all applications! Period! Incidentally, this blog is supposed to be a technical blog not a space for your commercials!

[Richard Hassebrock](#) Field Engineer at Castrol Heavy Duty Lubricants

Thank you Don and John for inserting some reason into the discussion. There may be a potential energy savings from using certain lubricants in certain applications, but a broad statement that "Any equipment using a synthetic lubricants uses less energy" is patently false. Which specific lubricant may provide an energy savings can vary for each application, and tightly controlled study is required to validate any actual savings. The explanation given in the OP is overly simple and baseless. The link in the OP is to the business website of the person making that post, and contains no information backing up the claims made.

[Michael Raab, CLS](#) Principal Consultant

I agree with Don and Richard here. While it is true that synthetic based products CAN offer energy efficiency improvements in some applications, it is also true that reducing the viscosity at the operating temperature CAN also yield an improvement. Likewise, the resistance to oxidation (i.e. viscosity increase / decrease) can have an efficiency effect both on viscosity stability and heat transfer characteristics. Even these are too simple to describe how to improve efficiency. Energy efficiency improvement is often difficult to determine because both energy demand and work (output) must be measured under comparative conditions. As Richard states "tightly controlled study is required...".

The self promotion and claims are not helpful, and is damaging to both our industry and to the reputation of good marketers who endeavour to meet ever increasing user demands. Rigorous documentation of both laboratory and field trials are demanded by today's well training and knowledgeable engineer, plant manager and maintenance personnel.

Some years ago I presented a paper on this topic at STLE. In that paper I site documented case studies done under both laboratory and field conditions. If you are interested, send an e-mail and I will endeavour to locate it for your reading pleasure.

[Jim Myers](#) Owner at Amsoil Synthetic Lubricants

I didn't start this discussion to determine what equipment would or wouldn't benefit using a synthetic lubricant. It was just to get people to investigate the benefits of using a synthetic lubricant. Because we can't attach documents to these discussion, I only mentioned AMSOIL because of the Field Trials they have been involved in. The Stop and Go City Driving tests were conducted by Auburn University's Program for Advanced Vehicle Evaluation. The testing was done at their National Center for Asphalt Technology Pavement test track. The Diesel Fleet Economy Study was done by Ford Motor Company in Rawsviile, MI. Jeff Foster Trucking based in Superior, WI was used in the 500,000 miles studies of both transmission and differential oils. Nordic Waste base in Duluth, MN took part in another Field test. Marine E-Tech Field Study was done by SEA-TOW, a marine rescue organization based in Naples, FL. Guardian Pest Control was part of an emission study. After 225,000 miles the Wisconsin Indianhead Technical College ran tests using the Sun 45EL Engine/Emission Analyzer Snap-on Technology with a NGS Ford Factory Scan Tool.

Most of these studies were to measure the changes which occurred after hundreds of thousands miles. The results were compared to the factory specs in the complete drive train, engine, transmission, and differentials. The Diesel Fleet Economy Study was to see, what if any, increase in mileage using synthetic lubricants.

I apologize for adding my web site in my first comment. My real intent was try and educate people. I have no special credentials, just a country boy who as far back as 1978 started using synthetic motor oil in my cars. The information each of you have added is a part of that education.

[Don McNeil](#) Industrial Sales - STLE Certified Lubrication Specialist at Apache Oil Company

You started your discussion with these comments "Any equipment using a synthetic lubricants uses less energy. Do the 100s of different size and shapes of the molecules in crude oil, there is already built in resistance when moving parts through it. A synthetic on the other hand is formulated in the laboratory by a chemist who controls the make up of the molecules, clones of each other, which gives a ball bearing effect, or slipperier, which reduces friction. " This entire statement is inaccurate and just wrong! That's not the way to start a discussion! It looks and smells like what we used to call the "Snake Oil Salesman" approach which I have been combatting for over 45 years! Like the guy selling STP with the screwdriver test in the 1960s to show how slippery it was in your engine is what your approach to selling the benefits of synthetics reminds me of. Synthetic motor oils are a great development I use a synthetic in my own car and in most cases they are worth the difference in cost but not because it gives you 6% better fuel economy. That is just wrong and bogus.

[David Piangerelli](#) Professional Lubrication Consultant

Richard and Michael are correct and add a lot of value to this "discussion" which did in fact start as a commercial. Unfortunately, the OP's original statement is in reality the perception many consumers and persons involved with asset management accept as a given truth. Synthetic lubricants in fact are not superior in every application and I have experienced first hand, situations in which a mineral oil replaced a synthetic oil with reduced operating temperatures and amperage.

Although one cannot deny the importance of the base stock characteristics, it is the fully formulated lubricant's characteristics that matter. The additive chemistry and it's synergistic effect with specific basestocks determine the performance capabilities of the finished lubricant. In addition, operating temperatures of the application are an important parameter with regard to if in fact a synthetic base oil will provide superior performance. The pressure viscosity coefficient of a particular basestock at a specific temperature is a major determinant of the actual film thickness. Google "Selecting Oils with High Pressure Coefficient" for an excellent article written by Robert Errichello of Geartech.

[toby taylor](#)

David, educationally the pressure coefficient of viscosity is probably the most significant factor beyond its real reactivity contact temperature controls the dynamics of the fluid shear film which synthetics inherently possess. This does not however define if the fluid works any better within a hertzian contact simply because it a synthetic lubricant.

[Gary H. Weinberg STLE-C.L.S.](#) Tribologist at Western Sierra Services Inc

Toby, You are so right! Don doesn't follow our train of thought on this subject. We are speaking about synthetic lubricants in general and "yes", they conserve energy and make moving parts more efficient. Proven by many companies even the old Mobil Oil Corporation!

[Don McNeil](#) Industrial Sales - STLE Certified Lubrication Specialist at Apache Oil Company

What you just said is not what Toby said or I believe meant. The statement that synthetics in general conserve energy and make moving parts more efficient is inaccurate, incomplete, and wrong and has never been proven by anyone! That doesn't mean synthetics aren't good products it just means they are not the best for every application! Base stock is only one of the things that produces the performance in a product.

[toby taylor](#) Consultant Tribologist at MT.TRIBOS

Gentlemen, the debate about synthetic materials is not under question regarding their superior viscometric properties. Having got the T shirt with nearly 10 year Trials on Mobil 1 long drain trials in the UK proved that in multi fleet vehicles their cost was far outweighed by their need for constant monitoring . Unlike other companies SHPD products. Never the less a product well ahead of its time. enough of an early example.

PAO for current transmission units in Wind Turbines gave initially much improved performance

through both viscometric control which fundamentally governs the control of the initial onset of fatigue and also its oxidation stability. The recent researches & seminars at last identify that fatigue is not just controlled by the oil film but the purity of the metal the film rolls and slides between. Tribologists and metallurgist already understand all this already but it takes the real world anything up to 20 years before they do something positive to address the "real issues".

So my OILY pensions are well served by the companies I have worked for but the real world of lubrication has become an almost an over ripe subject for any long term research . The desperate state of the major additive companies to use specific additives to ensure warranties is a denial of scientific progress . So the outcome is confusion reigns and the customer is always the loser.

Fuel economy Gear Oils or FEGO's claim that Synthetic Oils give better results . If you really study the process dynamically in a rolling road experiment at various ambient temperatures you will observe the only real economy is in the first 300-400 yards of the vehicles movement . Claims of 5, 6, 7 % are not realisable in the real world. Yes they can achieve these claimed figures at start up but when measured after a mile the claims are not discernible . Again the fact and fiction is the tribologists constant battle . Marketers we luv,m really. "Dont give em facts..... just sell the dream ".

[Jim Myers](#) Owner at Amsoil Synthetic Lubricants

Synthetic gear oils 'give better results', in what way? What rolling road experiment are you about? How can someone measure any results in 300 or 400 yards? What happens to the gear oil after those 400 yards that it doesn't continue giving some increase fuel mileage? I don't know of any synthetic gear oil that improves mpg by 5% or better. By using synthetic lubricants throughout, engine, transmission and differentials those increases are achievable.

Whether a synthetic lubricant is the best lubricant depends a lot of different factors. I stand by my original statement, "Any equipment using a synthetic lubricant uses less energy". If I pull my sons' on a sled through the snow, I'll burn more calories then I would pulling them across the ice. An other "highly technical" example is add a couple of drops of hand lotion, representing petroleum oil, in your hands and rub them together, works for awhile, but it soon loses it's ability to provide protection. Now add a couple of drops of liquid dish soap in your hands.

I shall continue: and rub them together, not only is it much slipperier it lasts a lot longer. My question to some of the comments above, where does the reduced energy go? I was asked to prove my point by some studies. I have done that, now I would like to ask for some studies that prove other wise.

Viscosity was mentioned in one comment. Viscosity of a lubricant is another factor that can be measured as to it's ability to increase mpg. Anyone involved in auto racing knows that the teams use a low viscosity oil, running their qualifying laps, because they can run faster. However they move up to a higher viscosity oil with additional additives that will with stand 500 miles of high rpms and the extreme pressures created.

I don't care what lubricants you use, just educated yourself with as many differing opinions and studies then you can decide which one would benefit you.

[toby taylor](#) Consultant Tribologist at MT.TRIBOS

Jim, very easily using a continous fuel consumed , power kv profiling , temperatures in contact zone of gears on a continuous basis. However I do not wish to denigrate synthetics but merely to refer you to established protocols of research findings by all the established players and their facilities throughout the world including USA . An excellant symposium which I was indirectly involved in, organised by the Institute of Petroleum back in the 80,s. It produced many papers "Performance and Testing of Gear oils and Transmission Fluids Edited by R Turret & E P Wright. Published by Heyden & Son Ltd ISBN 0 85501 326 5.My particular interest was in the study of fatigue mechanisms of sliding and rolling contacts and the lubricant chemistries to alleviate the onset of fatigue.

[Don McNeil](#) Industrial Sales - STLE Certified Lubrication Specialist at Apache Oil Company

Toby - I think you are talking to a lost cause. Jim just can't help himself and reminds me of the STP salesman in the 60's who would come to a trucking account with a screwdriver. He would dip the screwdriver in the SAE 30 oil they were using in their trucks and ask them to hold onto the screwdriver and in fact they could. He would wipe off the motor oil and then did the same thing with the STP, which was really nothing more than a low grade very shear unstable VI improver with a very high viscosity, and the screwdriver would slip right through their fingers. Then the salesman would say (and in many cases he really believed just like Jim) that the STP would make your engine more slippery. This was supposed to prove that STP would reduce engine wear in your engine and they would also throw in that race car owners and drivers used STP. That is the kind of test of slippery substance Jim can accept. A whole lot of hype without any technical backup. Synthetics simply are not best choice for every application and in many cases they are not nearly the most cost effective solution but guys like Jim will keep misleading people with their hype!

[Wilson Zaabel](#) Business Development Manager, Global Accounts at Kyodo Yushi USA, Inc.

The efficiency of every lubricant in any application depends upon myriad factors. I don't believe the opening statement of this thread has merit because, A) No specific application or piece of equipment is named and B) "Synthetics" is a very broad classification term. Because "equipment" can mean an automobile crankcase, electric motor bearings, hinges on the International space station ports or steel mill back up roll bearings, any such general "rule" will certainly have some exceptions.

The general principle that **identical "clone" fluid molecules will generate less internal friction under shear conditions than will a diverse mixture of widely varying size and shaped ones (as in commercially available mineral base oils)** seems apparent. Just because something is "synthetic" does not necessarily mean it's "better". All the variables should be taken into account before selecting the "best and most efficient" lubricant for a given application. Not the least of which are the economic ramifications.

[Martin Gough](#) General Manager at Penrite Oil

Jim, didn't mean to offend -congrats for having the cahoneys to take a provocative stance and setting the ball rolling. My view? Total loss industrial systems don't benefit (expense), some esters can give issues ref lubricity, manufacture is sometimes not as easy due to additive solubility issues, solvency can sometimes be advantageous in systems, etc. But synthetics do, of course, have a very important place, particularly difficult and high and low temp apps (a crucial place in achieving low W grade auto oils). Like Toby T, I'm a horses for courses man, myself.

[Dr. Rajan Mookken](#) Super annuated as GM(Lubricant Technology after 37 years at Indian Oil Corporation R&D Centre, Faridabad

Synthetics CAN be the final answer; but the machine ,filters ,seals, lubrication schedules , practices, have to be equally matching with the High initial cost of these products. Otherwise , Gp III or GTL bases are also cost effective solutions for the existing hardware.!

ExxonMobil has received approval for its **Mobil Jet Oil 387** to be used in GE Aviation's GE90 engine range. The GE90 engine was designed specifically for the Boeing 777 aircraft and is the world's most powerful turbofan engine. The approval includes the GE 90-76B, GE 90-85B, GE 90-90B, GE 90-94B, GE 90-110B1 and GE 90-115B. The lubricant is already certified for use on Trent 900, 1000 and XWB engines, as well as the GENx and CF34-10.

=====

By [Joe Beeton](#) • January 29, 2014

BP agreed to sell its aviation turbine oil business assets to Eastman Chemical Co. for an undisclosed amount, both companies announced yesterday.

The deal, expected to close in the second quarter of 2014, includes BP's aviation turbine oil manufacturing, blending and packaging operations in Linden, N.J., and laboratory equipment in Naperville, Ill. Eastman will also acquire BP's aviation oil product formulations and customer contracts, which include long-term deals with global commercial airlines.

Kingsport, Tenn.-based Eastman Chemical will integrate the aviation oil business into its specialty fluids and intermediates segment, the company said in a Jan. 28 press release. The aviation turbine oils will complement its Skydrol brand of aviation hydraulic fluids, which the company added to its portfolio in 2012 when it acquired Solutia for \$4.7 billion. Eastman also produces chemicals that are used to produce synthetic lubricants, and chemicals that are used as additives for synthetic lubricants in applications including metalworking.

Eastman anticipates that BP's aviation oil business assets will be worth approximately \$100 million in annual revenue and will surpass the purchase costs by the end of the 2014 fiscal year.

BP decided to divest its aviation oils segment after review of its entire lubricants portfolio, said Iain Conn, the company's chief executive for refining and marketing, in yesterday's press statement. Conn added that the sale will allow it to focus on investments in other industry sectors. BP will still be involved in the global aviation fuels business through its subsidiary, Air BP.

=====

Propylene glycol is non-toxic and can be used in the food processing industry.

=====

Webinars: The Evolution of Synthetic Lubricants

Click the link below to continue reading <http://onlinedigitalpublishing.com/publication/?i=139567&p=22>

Best Practices: Commissioning a new machine for reliability centered lubrication

For roughly \$500 in hardware expenses, along with the cost of consumables, a machine may be fitted for better performance and reduced long term cost of care. The actual hardware cost is irrelevant when one considers the amount of production that a given machine is responsible for during its normal life cycle. The decision should proceed on either... Click the link below to continue reading

<http://onlinedigitalpublishing.com/publication/?i=139567&p=26>

Other Featured Articles include: Peer Reviewed Papers:

Proposal of an FTIR Methodology to Monitor Oxidation Level in Used Engine Oils: Effects of Thermal Degradation and Fuel Dilution <http://onlinedigitalpublishing.com/publication/?i=139567&p=42>

From the Editor: Deadly progression <http://onlinedigitalpublishing.com/publication/?i=139567&p=8>

On Condition Monitoring: Complexity in oil analysis: Part VIII

<http://onlinedigitalpublishing.com/publication/?i=139567&p=79> Worldwide: Ionic liquids as lubricants <http://onlinedigitalpublishing.com/publication/?i=139567&p=82>

=====

As the need for engine oils that produce lower emissions has increased, the method of processing crude has changed to a hydrogen cracking method from the former solvent cracking method. The result is Group II base oils. **Group II base oils do not separate well from water** and require the use of a vacuum dehydrator to

successfully remove all three levels of water contaminants, including the most difficult -dissolved water.

The dehydrator's vacuum lowers the water vapor pressure inside of a chamber while at the same time, the contaminated oil passes through that chamber. This lowering of the water vapor pressure causes the water to change into the vapor state and be discharged as vapor by the vacuum pump. These systems are plumbed to the oil reservoir in a kidney loop configuration and are useful for applications that have a large volume of water contamination.

=====
Generally, the rate of lubricant degradation doubles with every 18 degrees F increase in temperature. Once formulated with antioxidant additives, PAO-based lubricants have a lower baseline rate of oxidative degradation. At low temperatures, a PAO's increased oxidative life may not be noticeable, particularly if you have to change the oil at some point for other reasons. At higher temperatures, the synthetic may last noticeably longer.

Typically, you begin to notice the extra life provided by a PAO above 160 degrees F (71 C). If it is above 180 degrees F, and especially 200 degrees F, the difference in oxidative life becomes quite apparent. However, the point at which a change to synthetic is justified is dependent perhaps on a handful of additional "program management" parameters such as:

1. Do you intend to run your gear oils with an appropriate use of filtration and oil analysis to support life-cycle extensions for many years?
2. Are you currently doing oil analysis and performing condition-based changes?
3. Do you have, and have you communicated to your lab, oxidation limits that flag impending oxidation problems?
4. Does the machine's operating temperature vary a great deal (a PAO's high viscosity index enables it to operate across a wider temperature range)?
5. Do you have an effective contamination control program in place that will enable you to fully exploit the PAO's extended life?

With the appropriate management strategy, a change to a high-performance product can actually cost considerably less than the equivalent mineral oil product type. Outside of these considerations, somewhere around 165 degrees F represents the point at which you probably should begin to consider the use of synthetics for the sake of lubricant longevity, if not for the sake of reliability.

<http://www.machinerylubrication.com/Read/28606/hot-for-synthetic>

=====
Future (wiki)

A process to break down polyethylene, a common plastic product found in many consumer containers, is used to make wax with the correct molecular properties for conversion into a lubricant, bypassing the expensive Fischer-Tropsch process. The plastic is melted then pumped into a furnace. The heat of the furnace breaks down the molecular chains of polyethylene into wax. Finally, the wax is subjected to a catalytic process that alters the wax's molecular structure leaving a clear oil. (Miller, et al., 2005)

=====
Rob:

Industrial synthetics are still seen as key - door openers and make good margin. Energy saving is a focus area.

Mobil 1 is of course still king - a lot of advertising, plus the imported exposure on TV etc.

A lot of newer cars are calling for modern specs such as MB 229.3, 229.31(low

SAPS).BMW LL 04, ACEA C2 & C3 - Mobil have Mobil 1 ESP Formula 5W-40 (PRV: in fact 30) - all for vehicles with emission devices. Synthetics are moving into the commercial vehicle market, with Formula MB doing well, along with transmission/drivetrain fluids becoming common products. Delvac MX is the flagship product. Compressor oils are difficult because most of the key OEM's sell own brand products and therefore they seldom issue approvals nowadays. Mobil have a good range, but our sales success is limited.

=====

Nitrites + Amines = Bad News

By Nancy DeMarco

Metalworking fluid manufacturers and marketers need to check with their steel drum suppliers, to be sure they are not using sodium nitrite as a final rinse to prevent rust. Nitrites in the rust inhibitor can react with secondary amines in metalworking fluids, forming carcinogenic nitrosamines.

At its Management Forum in San Diego earlier this month, the Independent Lubricant Manufacturers Association's Safety, Health, Environmental and Regulatory Affairs Committee reminded all companies handling metalworking fluids that both new and reconditioned steel drums can contain nitrite residues if sodium nitrite is used as a final rust preventive flush.

ILMA has advised its members to contact their drum suppliers, to assure that drums destined to contain metalworking fluids have not been treated with sodium nitrite.

Paul Rankin, president of the Reusable Industrial Packaging Association in Rockville, Md., which represents drum reconditioners, told Lube Report, "Sodium nitrite is a standard rust inhibitor for both new and reconditioned drums. It has been used for decades and it works." He emphasized that RIPA believes any residue would contain very low levels of nitrites.

John McQuaid, executive director of the Steel Shipping Container Institute in Arlington, Va., whose members are new drum manufacturers, said that some SSCI members use sodium nitrite as a rust inhibitor while others do not.

"In the steel container industry," said McQuaid, "it is well known about nitrites forming nitrosamines when combined with amines, and what countermeasures to take to prevent that from happening."

However, McQuaid continued, "One SSCI member commented that sodium nitrite is the rust inhibitor of choice."

The U.S. metalworking fluid industry discontinued using sodium nitrite as a rust inhibitor in fluids themselves after the Environmental Protection Agency's 1984 advisory on the formation of carcinogenic nitrosamines when nitrite reacts with secondary amines.

The resurgence of the issue has alarmed metalworking fluid manufacturers. "The industry is concerned about any doubts that can be raised about carcinogens and metalworking fluids," one source told Lube Report. Fluid manufacturers continue to face numerous lawsuits, and "it's undeniable that a secondary amine and nitrite are a problem.

"End users would be furious" to learn their fluids might contain detectable levels of nitrosamines, this source continued. "Check your drums."

=====

2011: Next year, Group II and III will see 12 percent and 42 percent shares of Europe's diesel engine oil market, respectively, while Group IV could reach 6 percent, he indicated. Group I, which enjoyed a nearly 70 percent market share in 2008 before Euro V was implemented, may garner only 40 percent, and continue to fade. That includes both heavy-duty and passenger car diesel applications.

Additives also are going to evolve as ACEA E9 and E6 gain ground. E9, issued in 2008, is a cost-effective grade with mid-levels of sulfated ash, phosphorus and sulfur (SAPS), intended to be compatible with diesel particulate filters in mid-drain interval applications. The E6 grade

defines high performing low-SAPS oils for long drain interval applications, and will continue to increase in demand, Lancaster observed.

These heavy-duty grades have roughly half the ash content of E7 oils, so they minimize ash buildup to reduce DPF blocking. "This characteristic delivers fuel economy benefit and the test results in ash buildup using E6 grade oil are better than using E7 grade oil," Lancaster said. "Significant differentiation in the amount of ash collected in the filter is observed when using low- and high-ash-containing engine oils."

These oil grades also contribute to enhanced environmental performance and enable vehicles to move in low-emission zones, such as the one that London authorities established in its most congested areas. "While driving from Heathrow airport to the center of London, drivers are faced with a big sign that says 'You are now entering a low-emission zone.' The vehicle registration plate is actually photographed," Lancaster noted, "and if it shows the authorities that the vehicle is not meeting the latest Euro emission standards, the driver has to pay a penalty, which is about 50 pounds per day for heavy-duty vehicles entering London."

Similar low-emission zones and incentives will likely be extended to various cities in Great Britain, he said. According to the World Health Organization, up to 600,000 deaths a year are associated with airborne particulate matter. "Direct and indirect effects of particulates and oxides of carbon, nitrogen and sulfur are affecting the global environment."

Meanwhile, vehicle population continues to grow, adding urgency to the issue. In 15 years the world's vehicle population is expected to double from where it was in 2005, he continued. "The number of cars introduced on the Chinese roads, for example, is somewhere around 600,000 units per month."

In 2011, Lubrizol conducted a survey into the heavy-duty vehicles and engine oils used in France, Italy, Germany, Poland, Hungary and Romania. "The results have shown that 51 percent of the lubricants sold for on-highway use are 10W-40 grade," Lancaster said.

Currently Eastern Europe has a much smaller commercial vehicle park than Western Europe across all vehicle sizes, the survey found. "For example France, Germany and Italy have around 7.5 million small (3.5 ton) commercial vehicles in total, while in Romania, Hungary and Poland this number totals to around 750,000," he said.

In mid-size vehicles (in the 3.5 to 16 ton range), the three Western countries led with 1.5 million units while the Eastern ones had only 220,000. For vehicles above 16 ton, the survey found around 1 million in France, Italy and Germany, and around 150,000 in Poland, Hungary and Romania.

Usage of heavy-duty low SAPS E6 oils in these six countries averaged 22 percent, according to the survey, and also varied by region. "Although the three Western European countries are using more E6 grade lubes (26 percent), their three Eastern European counterparts are using less (18 percent)," Lancaster observed.

The top three heavy-duty truck producers in Europe are Daimler, with 24 percent market share, MAN (14 percent) and DAF (13 percent). These three key OEMs have a combined market share of 51 percent, and all recommend the use of SAE 10W-40 engine lubricants meeting ACEA E6, the survey found. Iveco, the next largest, recommends E7 quality and 15W-40, while Volvo and Renault favor E9 oils in 10W-30 grade.

More than a third of the truck drivers in these countries expressed concern over turbocharger deposits and turbocharging failures, according to the survey. "It is one of the areas that lube marketers should look into," Lancaster noted.

E6 and E9 grades also show enhanced durability performance compared to conventional E7 oils, thanks to superior additive quality. "Advanced additive components combined with higher quality base stocks bring higher performance to the end user," Lancaster stated. "Oil that demonstrates good soot control can lead to improved fuel economy."

Lube marketers should really be looking to the end user, he continued. "An owner of about 250

vehicles spends around €16 million for fuel annually, and if a lube marketer shows him fuel economy of only 1 percent, the truck owner can save €160,000. It is a lot of money.”

[Andrea D'Eugenio](#) • My opinion is only for Metal working application...

Neat cutting oils:

Better lubricity than mineral OIL ...true...and in the first period you can have a good increase of tool life but if you work over 50°C....smell like Mc donald's fast food!

The oxidation is quickly than min OIL

sticky residue on machine tool. (Very nice green or yellow machine tools!)

higher consumption, the polarity of the lubricating base binds to the shavings. Most of the customers have tried the new then return to the mineral OIL .

Coolants :

Good mix it would be Ester (for lubricity) and min OIL(better anti foaming and rust protection).

Ester based coolants presents in the italian market are not so stables, problem of foaming and rust is the order of the day.

for the toxicological aspect: good selling point, but it's better to talk about 20 years from now, when we have more news about the consequences of such lubricant bases.

Regards

Andrea

=====
Dexron VI = Mercon LV

Brake fluid:

<http://www.amsoil.com/lit/databulletins/g2476.pdf?zo=1101364>

=====
[Jean-Michel Demaret](#)

Qualified Engineer / Senior Account Manager

PAG oils are recommended by the compressor manufacturer for screw compressor with oil injection. These compressors are able to reach higher pressure than oil free screw compressors, so likely they will generate more heat. I believe from different studies that because of their higher density PAG oils have a higher Specific Heat Capacity (can absorb more heat per weight for a set increase of temperature) than PAO. It is a 10-20 percent order of magnitude. As per the heat transfer coefficient (absorption and release of heat by conduction or convection) depending on the website one is better than the other.

For same volume of oil injected, the PAG is possibly able to cool better/provide a better seal than PAO. If your oil injected screw air compressor is operating at the limit of its capacity, a change of oil characteristic may add issues to the maintenance department.

[Rick Chabot](#)

Business Development at Isel Inc

Many are unaware there is advanced technology for Polyalkyleneglycol replacements oils using different additives and blends. One major drawback to PAG's on the market is their affinity for water. These advanced technology synthetic blends have all the beneficial traits to include exceptional water separation and excellent oxidative and thermal stability. The higher the VI number indicates a relatively modest change in viscosity in relation to temperature movement. This is very important for hydrodynamic lubrication, lubricity and lubricant return protecting the internals. I have information regarding this advanced technology for anyone that may be interested. Also POE and Diester oils are compatible.

[Ross Kovanda](#)

Owner/Vice President at American Chemical Technologies, Inc.

I would not necessarily call PAG's affinity to water a drawback as the water ingress does not change the chemical backbone of the fluid like the water would in other formulations. PAG's are also the only fluid that as they age and degrade, cannot chemically breakdown into sludges and varnishes like most other fluid chemistries will. Please send me what you have, it would be very interesting to see this new chemistry.

[Will Hurley](#)

Owner / President - Fluid Metrics LLC

PAG compressor fluids have a much higher specific heat capacity and thermal conductivity than do PAOs, or any other "PAG Replacement" fluids. These higher thermal properties enable the fluid to absorb and reject the heat of compression much better, which typically results in a 10-20 deg. F decrease in compressor operating temperature. This lower operating temperature not only benefits the compressor, but also the oil's service life (Arrhenius Equation - oil life is cut in half for every 10 deg. C / 18 deg. F increase in oil temp.)

As Ross points out, there are additional significant benefits to using PAGs in rotary screw air compressors, including their non-varnishing nature, higher Viscosity Index, and contrary to Rick's comments, their high water tolerance/solubility. Water is always present in air compressor fluids and PAGs can hold 10-20 times the amount of water in solution than can PAO fluids. This becomes important when compressors shut down and the oil is allowed to cool. When the oil cools, the water will separate out from a PAO and settle to the bottom of the sump. Then when the compressor restarts, the bearings will get water-washed, diminishing lubrication and protection. For this reason, combined with the PAOs tendency to varnish if run to failure, most compressor OEMs have abandoned using PAOs as their factory fill, and the few OEMs that haven't, recommend that the water be drained off the bottom of the sump before restarting the compressor (not very practical).

Finally, with all due respect to Rick, I would strongly caution anyone against the use of PAOs, or so called, "PAG Replacements" in rotary screw air compressors. Few compressor users are aware that most fluids advertised as "PAG Replacement" fluids contain very little or absolutely no PAG at all, are usually PAO base stocks, and very often contain Diesters, the cheapest, worst performing synthetic fluid you could put in a rotary screw compressor. Therefore buyer beware, and be sure to ask what base stocks are used in any "PAG Replacement" fluids you may be considering. An easy way to tell if the base stock is primarily a PAG verses a PAO is to look at the oil's specific gravity (normally included on the MSDS). A true PAG blend will have a specific gravity around 0.98, while a PAO, deceptively called a "PAG Replacement" by some, will have a SG near 0.86.

[Rick Chabot](#)

Business Development at Isel Inc

Interesting Will. I never mentioned to use PAO. Although I did say synthetic blends and proprietary formulations followed by offering information for a PGR. A base fluid will only do so much on its own. The additive package, blending process, and quantity will more so determine the ability of a finished product. I simply made it aware and available for those whom are interested. There is much more to synthetic hydrocarbons and advanced blending technology available in our industry and we have all made very valid points. Hence why we are using this channel of networking. Thank you for the contribution.

[George Abernathy](#)

Fluid Product Specialist at Steiner Electric

I'm sorry, did anyone ask about their air driers? Is it getting "cool air make-up" or stuffed in a closet? There is a ton of verbage above, and I agree with caution for seal materials, and necessary flushes to change over from one to another. I've also seen the PAG's in auto/truck

Compressors(Decatur-trucks/cars), but not as much in air compressors. Mostly the OEM's called for PAO's.

[Samer Akram](#)

Director of Operations at Unichem Services Ltd

Unichem Services have been marketing Dow's Oil Soluble PAGs (UCON OSPs) here in South Africa for a few years now, and there is some good feedback and literature that I have attached on our LinkedIn Company web page (<https://www.linkedin.com/company/unichem-services-pty-ltd>) . I have just uploaded our own compressor oil OSP formulation guide for interested parties to peruse and provide feedback on.

[Dilip Kulkarni](#)

General Manager at Raka oil Company, pune (Auth.Dist.Exxon Mobil)

YES, PAO is good replacement in applications of Hermit compressors ,in case of Reciprocating compressors Synthetic PAO are replacing and with better performance.

[Idalberto Leon Zvereff](#)

We made de change in ATLAS COPO compresor, with very good results, off course we made 3 flushing.

[Tapas Dey](#)

Head Business Unit - Steel Industry at Klueber Lubrication India Pvt Ltd

We (In Klueber Lubrication) in Adani Power had done a survey , in which moisture content in PG oils can safely go as high as 30000 ppm as against 500 ppm of normal mineral oils.

Having said that, I am not saying PG oils are the only techno-economical solution for screw or reciprocating compressor, even by using Polyalphaolephin oils, oil change intervals can be enhanced as long as 8000 working hours. Best practice shall be , before changing over from conventional oil to a speciality oil , you should take out 10%(of the sump capacity) of the oil from the sump and add 10% of Klueber Vernasol , to clean the sump. You may visit Klueber website for more details.

[Angelica Tovar-Settle](#)

Partner at Insumos Industriales

Polyglycols for air compressors are not a good choice: not for its lubrication properties, but polyglycols can be drag into the air, and this polymers are irritants of mucoses. They are excellent choices otherwise for a wide range of applications.