

SAIT Newsletter, July 2020

Tribology

Tribology plays an important role behind the fact that combusting one litre of diesel fuel converts into 2,64kg carbon dioxide (CO₂): reducing friction reduces fuel consumption, which lowers CO₂ and the impact of global warming. The correct lubricant for the task is too often not seen in the context of extending component life and reducing energy demands when subjected to price only considerations.

The correct lubricant for the task is not only a fuel consumption issue but also a measurable productivity factor. This is very evident in the work rate of hydraulic power – poorly specified hydraulic fluid will reduce work output values; however this may be evaluated in ton:hours or litre:minutes etc.

Then there are not only fuel consumption and productivity factors, there are also wear rates with added losses of service downtime. Forecasting component life is very difficult when using price-spec'd lubes in high-tech machinery.

The unfortunate fact is that very few people look at knock-on effects beyond price, which becomes the top priority in these times of business survival under the COVID-19 global recession. This is a tough time indeed for standards, and ignorance tends to rule.

Lube standards and policies are worth pursuing to protect valuable machinery at times like these. Take an integrated, tribological view – it's worth it in the long term.

Tracking Oil Temperature



This comment from Noria draws attention: *'Did you know an increase of just 10° C (18° F) cuts an oil's lifespan in half? Looking at it another way, with a slight reduction to your operating temperatures, you could save 50% on your oil budget!'*

Steven Lumley, Technical Manager at WearCheck, responds:

"This is true -For every 10°C increase in operating temperature you double the rate of oil oxidation thereby halving the life-time of the oil. However, reducing the temperature to below optimum can be just as dangerous as you can end up with an over-cooling situation. Allow me to regale you with the sordid details of this

very rare and forgotten engine killer.

"If anything, overcooling can possibly do more damage than overheating, particularly as far as the oil is concerned. Low temperature operation promotes the accumulation of moisture in the engine which, in turn, promotes the

formation of harmful acids. What makes it worse is that it is surprisingly difficult to tell overcooling and overheating apart.

“The results of the two problems are very similar, but generally with overcooling the viscosity does not increase, the increase in oxidation is less pronounced, there is no apparent increase in the additive levels and most importantly the sulphate level will increase.

“As you well know one of the major combustion by-products of diesel is water vapour. At normal operating temperature most of this is exhausted to the atmosphere. In an overcooling situation (due to lower operating temperatures) more of this moisture ends up in the sump where it reacts with sulphur oxides which are also combustion by-products. This produces acids which result in elevated wear and sulphate readings and a low TBN.

“We don't see this killer cropping up very often especially not since they have reduced the sulphur content of diesel, but this cold killer was a humdinger in its day. It really is a Goldilocks situation - the operating temperature cannot be too hot or too cold but instead needs to be just right for everything to work as it should.”

SAIT Training

Follow the path from data to information and into knowledge.

Register by 17 July to ensure your place on our first ONLINE Course:

Lubrication Engineering 126e

27 to 31 July 2020 via Zoom:

The course will be conducted electronically, with lecturers covering the different topics. Delegates are responsible to ensure that they are able to connect to the e-learning platform (ZOOM), with a computer / laptop, with speakers and a microphone, in a venue that will facilitate good learning and have sufficient broadband speed to ensure uninterrupted learning.

This course is registered with ECSA, number SAIMM01320, and is awarded four CPD credits.

Registration closes a week before the starting date of each course; please book early to ensure your position.

Please note that photographs will be taken during the course and published in the SAIT Newsletter and on the SAIT Website.

Costs:

SAIT Members: R11,385.00 Non-Members: R12,765.00

Students: R3,510.00
(proof of registration as a full-time student must be supplied with registration form)

NB: ‘Live’ courses will resume when Lockdown Regulations permit; courses for the remainder of 2020 and February 2021 are scheduled as follows, but are all subject to confirmation:

- **LE 129:** 24 to 28 August 2020, Cape Town
- **LE 130:** 19 to 23 October 2020, Johannesburg.
- **LE 131:** February 2021, dates and venue to be advised.



Costs:

SAIT Members: R17,135.00 Non-Members: R19,090.00

Students: R5 267
(proof of registration as a full-time student must be supplied with registration form)

For full details and to download Lubrication Engineering Registration Forms, go to [SAIT: Training](#)



The STLE's CLS, OMA and CMFS Examinations Hosted by The SAIT



Society of Tribologists and Lubrication Engineers

The South African Institute of Tribology will host the STLE's CLS, OMA I and OMA II and CMFS examinations on **20 November 2020**. The venue will be Science Park, Kelvin.

- **Certified Lubrication Specialist (CLS):** Although not compulsory, it is highly recommended that you first attend the SAIT five-day 'Lubrication Engineering' course. A distinction of 75% is a good indication of success in the CLS exam, where the standard is high and the pass mark is 70%. The recommended books for the CLS exam are the STLE Alberta Section 'Basic Handbook of Lubrication' Third Edition, and/or the AIST 'The Lubrication Engineers Manual' Fourth Edition.
- **Oil Monitoring Analyst (OMA I and OMA II)**
- **Certified Metalworking Fluids Specialist (CMFS)**

A significant amount of study is required for these exams, so it is advisable that candidates make an early start. Recommended reading for all modules is on the [STLE website](#) under "Professional Development".

For further information, costs and to register, please contact Gill, Isabel or Berice at the SAIT offices:

Tel. (+27) (0)11 804 3710 or email secretary@sait.org.za or admin@sait.org.za.

SAIT Events

SAIT AGM, 2020: While the National Lockdown continues, the SAIT plans to hold its AGM in a simultaneous live and live-streamed Zoom meeting in August. When finalized, details will be emailed to all members. All members will be invited to attend the AGM, and members in good standing will be able to vote on all matters to be decided.

SAIT Membership Fees: A reminder that SAIT Membership Fees for 2020/21 are due; relevant invoices were emailed in early April. We understand that the lockdown has caused financial difficulties, but will appreciate it if those Members who can do so will pay their membership fees before the AGM and let us have Proof of Payment by email to admin@sait.org.za as soon as possible. Thank you.

We will keep you informed of all updates and changes to our schedule.

The SAIT's 2020 Annual Awards Dinner has been cancelled due to Covid-19 Lockdown Level 4 Regulations, which do not allow for gatherings.

International Events

For a list of upcoming international events please visit [Tribonet Conferences](#) where links take you to each event in full detail.

Contamination Corner

Moisture in lubricating oils can have a devastating impact on component lifecycles. According to a major bearing supplier, it is possible to shorten the life of rolling element bearings by as much as 75 percent without ever knowing that moisture is in the oil based on visual observation. The following comment from Noria.com explains -

- Water causes oxidation, acid formation, varnishing, sludging, foaming, viscosity problems (water first thickens and then thins the oil) and can cause an oil to become conductive. Water also creates conditions for corrosion to dramatically increase.
 - Water can be driven off oil by maintaining the right temperature and using absorbent media filters and vacuum dehydration. Industrial equipment that is frequently turned on and off is most susceptible to moisture from the atmosphere, particularly during the summer months when atmospheric moisture is at its peak.
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Did You Know?

Did you know that the wheel was probably invented around 8,000 B.C. in Asia?

The oldest known wheel found in an archaeological excavation is from Mesopotamia, and dates to around 3500 BC. This period was known as the Bronze Age. The invention of wheels helped vehicles to move along by **transferring and reducing friction**. How dependent we are on wheels was very visible during the COVID-19 Phase 5 lockdown in South Africa – apart from COVID-19, this age will probably be regarded by future archaeologists as the ‘Plastic Age’.



For more information, please visit <https://www.tribonet.org/tribology-history/>.

watch the two-minute YouTube clip at <https://www.youtube.com/watch?v=rcxfxYX33FE>, or Also See www.nationalgeographic.com/environment/2019/09/tires-unseen-plastic-polluter/



Parting Shot

Fluorescent Dyes – What For? Yes! Leak Detection!

Why struggle to detect leaks before they become expensive failures? Many technicians are in need of advanced solutions. So, how about using UV Leak Detection?

Simply add a small amount of fluorescent dye into a system and allow it to circulate with the host fluid or refrigerant. The mixture then escapes and accumulates at all leak sites. Leaks will be easily visible by scanning the system with a UV light using yellow glasses.

Although the dye is expensive, only a small amount is required, and it will enable fixing leaks before they become expensive failures. This can result in significant cost-savings.

We Want to Hear from YOU

1. Please let us know what topics are of interest to you: submit interesting articles that we can share with the SAIT community, to admin@sait.org.za, for forwarding to The Editor. This will assist in disseminating information to all involved in Tribology.
2. Please also let us know what would interest you for technical sessions / webinars – or any interesting presenters from whom you would like to hear.

We look forward to hearing from you!

Please Like the South African Institute of Tribology – SAIT – on Facebook and regularly check our Website for updates.