

SAIT Newsletter, August 2020



RIP Doug Herschell

**From Patrick Swan, SAIT Vice-President,
and on behalf of the SAIT Executive Committee, 2019/20**

Doug was mentor to many people during his life because he cared so much for people and their aspirations. He was enduringly honest, and disliked dishonesty in others: that was a quick way of losing his support and friendship.

It was natural that Doug was a foundation member of the SAIT, and remained a member in good standing ever since it was formed. Along the way he was awarded the Louw Alberts Award, which is presented for an outstanding contribution to tribology over the years in Southern Africa, and was elected as President of the SAIT in 2018. His passion for tribology and the SAIT was a welcome boost to the institute. When elected he was in hospital, in traction after a fall, and sadly he is the only President to die in office, after his almost 20 year battle with cancer.

Right up to the end his mind was clear, he was still reading his science publications, and planning how to improve the SAIT.

From The SAIT Secretariat.

It is with great sadness the SAIT announces the passing of SAIT President Mr. Doug Herschell (Born 19/7/1942 and Died 22/7/2020). Doug dedicated a lot of his time to the South African Institute of Tribology, of which he was president for 2018/2019 and 2019/2020.

A special note was his loyalty to the SAIT, of which he has been a member since March 1985. He is only one of the few to have this continuous membership from the establishment of SAIT in 1985. In 2018, Doug also received the SAIT Louw Alberts Award in recognition of "his significant contribution to tribology and the SAIT, through driving the fundamentals of tribology, and understanding the application, operating condition, base fluid and chemistry required to solve tribological issues."

With a career exceeding 55 years in the lubricant industry, Doug Herschell's experience in formulations and technicalities earned him an enviable title as the "go to man" for bespoke industrial lubricant and aerosol solutions.

For more tributes from SAIT Members, go to the [SAIT Official Blog](#)

Tribology

Tribology is subjected to the impacts of important co-travellers. A high-ranking subject is **filtration**. Particle debris causes friction and wear in any situation involving the movement of two surfaces in relation to each other. An excellent example is that of diesel fuel passing through an engine fuel injector under very high pressure.

Modern diesel engine injectors run at well over 2000 bar which in turn requires extremely fine tolerances (between 2 to 5 microns) to control fuel flow and spray patterns into a combustion chamber. A micron is defined as one-millionth of a metre. Diesel fuel cleanliness is an absolute demand – engine manufacturers are looking for cleaner and cleaner fuels. In such conditions, particles will cause friction and abnormal injector wear if the fuel cleanliness is insufficient. Fuel cleanliness is therefore essential and needs to be managed throughout the supply chain (including fuel tank breathers). 99 percent efficiency filters may not be sufficient to prevent engine failures. A 99% efficient filter can still be the root cause of an injector failure and costly replacement. **A 99.000 % efficient filter will let through 1,000 particles for every 100,000 particles, while a 99.99% efficiency filter will only let through 10 – which is better?**

Some engine manufacturers specify filtration control below 3µm partnered with very high filtration efficiency. All of this can be read in an informative 12-page White Paper published by Donaldson – ‘The Effect of Hard Particle Wear on Diesel Injectors’. Particulate in the range of 2-3 µm produced mechanical damage in a 24,650 psi HPCR system. See the conclusion of the white paper (24,650psi = 1700bar) – HPCR = high pressure common rail system.

Please visit

- ✓ <https://www.donaldson.com/content/dam/donaldson/engine-hydraulics-bulk/literature/north-america/bulk-fluids/F111422-ENG/Diesel-Injector-Wear-White-Paper.pdf>

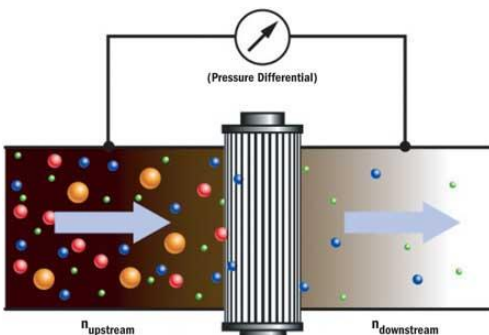
Filtering New Oil

The hackneyed definition of ‘assume’ is that it makes an ‘Ass out of U and me’. And when it comes to fresh lubricant in a sealed container the assumption is that the product is particle-cleared to the maximum degree. But the cheaper you go the worse it gets – word in the market is that containers are re-used in some cases.

Harvard Corporation was founded in April 1973. Then, as it is now, Harvard’s mission was to develop, manufacture, and market the best filter and purification systems on the market. Harvard offers the following advice:

‘As surprising as it may seem, most new oils purchased today are not filtered before being sold. Yes, the new oil is refined, looks translucent and visually appears clean but when viewed at a microscopic level it contains unwanted particles. In many cases, the filtered oil in the equipment being replaced has less unwanted particles than the new, unfiltered oil being added during an oil change.

Typically, new oils delivered to customers are rated 22/21/18 (ISO 1044c Cleanliness Standard – now ISO 4406) and sometimes worse. To eliminate the risk of adding new contaminated oil, the end user is placed in a position of having to filter new oil before it is put into service which assures:



- Removal of unwanted particles, including any particles picked up during the delivery or internal company oil transfer process.
- Prevention of premature equipment wear and undesirable equipment down time.
- Clean oil is being installed.

Filtering the new oil is a very critical, proactive maintenance step. Which would you prefer, assuming or knowing that the new oil is truly clean? The oil filtration process must start with clean oil to positively impact equipment performance. With the expenses, complexities and increasing demands on equipment today one must capitalize on every performance advantage possible. New oil filtering is an easy first step to apply and a sure bet.’

Please visit:

- https://harvardcorp.com/advantages/new_oil.asp?



SAIT Training

Follow the path from data to information and into knowledge.

Lubrication Engineering

All of our courses, online and 'live', are registered with ECSA and are awarded 4 CPD Credits.

e-Learning with the SAIT

The SAIT's first online, or e-learning, course, Lubrication Engineering 126e, was successfully held from 27 – 31 July 2020. Delegates needed 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 facilitates good learning and has sufficient broadband speed to ensure uninterrupted learning.

More e-Learning courses are being planned, please go to the SAIT Website's [Training Page](#) for updated information.

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.

<i>e-Learning Costs:</i>		
SAIT Members: R11,385.00	Non-Members: R12,765.00	Students: R3,510.00 <i>(proof of registration as a full-time student must be supplied with registration form)</i>

'Live' courses

Face-to-face 'live' training will resume when Lockdown Regulations permit; courses for the remainder of 2020 and February 2021 are scheduled as follows, but are **subject to confirmation**:

- **LE 130:** 19 to 23 October 2020, Johannesburg.
- **LE 131:** February 2021, dates and venue to be advised.

<i>'Live' Course Costs:</i>		
SAIT Members: R17,135.00	Non-Members: R19,090.00	Students: R5 267 <i>(proof of registration as a full-time student must be supplied with registration form)</i>

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: The SAIT's 36th Annual General Meeting was successfully on Tuesday evening 5 August at 17:00 on Zoom, with a quorum of members in attendance. A separate report-back will be made available on the [SAIT Website](#) on the [SAIT AGM](#) page.

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 pay their membership fees as soon as they are able, and let us have Proof of Payment by email at admin@sait.org.za. Thank you.

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

International Events

For a full list of upcoming international events please visit [Tribonet Conferences](#) where links take you to each event in full detail. For news on the Plenary Speakers and important dates, please read on.

For full information about the **7th World Tribology Congress**, to be held in Lyon, France, from September 5 to 10, 2021, please visit [WTC2021](#).

For further information on Speakers, Events and Important Dates for WTC2021, please read on.

PLENARY SPEAKERS



Jay FINEBERG
The Hebrew University,
Jerusalem, Israel



Jean-François JOANNY
Collège de France,
France



Valérie MASSON-DELMOTTE
IPCC, CEA,
France



Nicholas D. SPENCER
ETH Zürich,
Switzerland

KEYNOTE SPEAKERS

Zhou FENG
Lanzhou Institute of
Chemical Physics,
China

Michael MOSELER
University of Freiburg,
Germany

Anne NEVILLE
University of Leeds,
United Kingdom

Luis SAN ANDRES
Texas A&M University,
United States

Visit the [Speakers Page](#)

The Congress Program: A very rich and intense program which includes:

- > Young Tribologists Events: 3-Minute Thesis Contest, Career Fair, Evening
- > Sponsor Lectures, 40 Invited Talks, 17 blocks of Standard Sessions
- > Poster Sessions, Exhibition
- > Social Program: Welcome drink, Live show and party, Conference Gala Dinner

Visit the [Program Overview Page](#)

Any contribution is welcome until 15 October 2020 through the [submission platform](#) and will be reviewed by the scientific committee. Acceptance will be notified by e-mail **by end of January 2021**. Selected papers will have the opportunity to be published in the peer-review journals partners of the conference, which are referenced on the [conference website](#).

Important Dates:

Abstract Submission:
Opening: **30 March 2020**
Closing: **15 October 2020**

Early-Bird Registration:
Opening: **15 September 2020**
Closing: **15 April 2021**

Contamination Corner

Contamination is not just about particle counts that abrade surfaces moving in relation to each other. In a lube-failure situation an unseen and often overlooked contaminant is **vibration**. Vibration can be either externally or internally developed in moving machinery with a costly outcome that shortens component structural life.

Vibration is the relationship between forces and resistance to that force that are measurable. More importantly, vibration patterns can be benchmarked so that changes can be tracked and brought alongside lubrication analysis as a confirmation in assessing developing wear patterns.

For example, an R8 million industrial gearbox cannot be left for replacement only when failure occurs – to start with there may not be R8 million lying around to replace the component. A failure that is not anticipated causes downtime and, in this case, disrupting an entire production facility may cost far more than R8 million. Accurate/professional vibration and lubrication analysis will predict the correct time and plan for replacement.



It's much more than just vibration, but the type of vibration, which can be separated into individual components. Modern systems use online, wireless, 3-dimensional, routine, video's, lasers, special signal processing techniques, etc to achieve this. Vibration detection looks at the total picture from secure foundations to precision alignment in a unique ambient temperature environment – an essential partner of root cause analysis.

For detailed information and expertise please contact [the SAIT office](#).

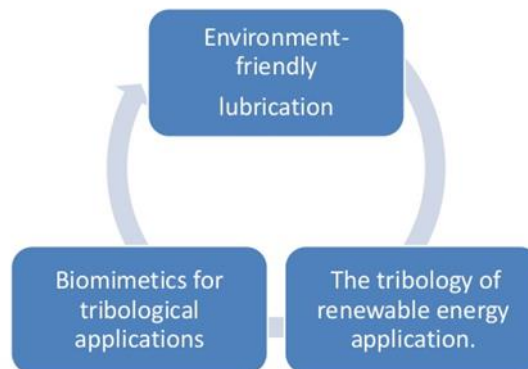
Did You Know?

Did you know that Green Tribology has now become part of the vocabulary? Green tribology is a branch of tribology that relates specifically to maintaining an ecological balance of any potential environmental and biological impacts of the interactions between various surfaces that can occur between materials. Green tribology works to ensure that any friction and wear occurring between materials happens in an environmentally friendly manner. Researchers in the green tribology field are also looking at wind-power turbines, solar panels and tidal turbine. They are focusing on being more environmentally-friendly and sustainable in the future.

Green tribology has three basic principles aimed at ensuring limited impact on the environment and human health. These three principles are:

- **biomimetics** (imitating the models, systems, and elements of nature in order to solve complex human problems) and self-lubricating materials and surfaces, biodegradable
- **environmentally-friendly lubrications**, and
- **renewable and/or sustainable sources of energy**.

AREAS OF GREEN-TRIBOLOGY



See the full article at <https://www.tribonet.org/wiki/tribology/>



Parting Shot!

SAE – it's not South African Engineers!

SAE is the venerable **Society of Automotive Engineers** – SAE International. The SAE positions itself as ‘*The ultimate knowledge source for mobility engineering*’. The SAE focus is on being the leader in connecting and educating engineers while promoting, developing and advancing aerospace, commercial vehicle and automotive engineering.

SAE International is a global association of more than 128,000 engineers and related technical experts in the aerospace, automotive and commercial-vehicle industries. SAE core competencies are life-long learning and voluntary consensus standards development. Please visit <https://www.sae.org/about/>

The Society of Automotive Engineers (SAE) is a viscosity grading system for oils used in the automotive industry. To avoid confusion, it is divided into two subclasses, one for gear oils and one for engine oils. A high number (greater than 60) means that the oil is formulated for a gear type component while a low number corresponds to oil which is used in the engine. The numbers associated with the SAE system are shown below:

Engine Oils		Gear oils	
0W	25W	75W	90
5W	20	80W	140
10W	30	85W	250
15W	40		
20W	50		

For more information, please visit: https://wearcheck.com/virtual_directories/Literature/Techdoc/WZA007.htm

We Want to Hear from YOU



1. Please let us know what topics are of interest to you: submit interesting paragraphs or articles that we can share with the SAIT community, by sending them to admin@sait.org.za, for forwarding to The Editor. This will assist in disseminating information to all involved in Tribology.
2. Please let us know what would interest you for technical sessions or webinars
3. Please let us know of 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.