

SAIT Technical Newsletter, February 2021

Bringing the Committee Closer to the Members and the Wider Tribological Community

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Tribology



Tribology takes to the skies – Aerospace Tribology is a vital component of airline safety, both on the runways and the skies around the globe. As you sit comfortably in an aircraft seat and glance at the engine outside, consider that the whole aircraft may have to deal with ambient temperatures ranging from +50°C on a hot runway to -50°C at 35,000 feet. Aerospace is also not a place where failure allows an aircraft to pull over to a ‘kerb in the sky’ and wait for a recovery unit.

DVI Aviation, aviation safety experts and a multi-disciplinary aviation company, devotes a whole section on their website to Aerospace Tribology. To quote:

‘Aerospace Tribology is the study of friction and wear, and moving contacts are of vital importance to all aerospace applications. For example, fretting and wear of

hinges, tracks, bearings, and gearboxes in airframes and engines is a constant problem for aircraft, as they induce failures and jamming, necessitating costly in-service inspections and replacement of parts.’

In South Africa WearCheck has been active for more than 10 years in aerospace tribology – it’s a complex business. Says Steven Lumley, WearCheck Technical Manager, “Our aviation monitoring team carries out oil and oil filter analysis on aircraft components such as piston engines, turboprop, turbofan and turboshaft engines. Our analysis also includes auxiliary power units (APU’s), helicopter rotor gearboxes and hydraulic systems.”

It’s all about forecasting and planned maintenance – in the case of aviation tribology the primary objective is to prevent an IFSD (In-Flight-Shut-Down).

Please visit http://www.dviaviation.com/Aerospace_Tribology.html

2030 Petrol & Diesel Car Ban in UK: Impact on Tribology?

According to a TOPGEAR report (18 Nov 2020) the UK Government brought forward its plan to outlaw the sale of petrol and diesel cars and vans. The new date is 2030 (it was previously 2035) while **plug-in hybrids** will be allowed until 2035.

<https://www.topgear.com/car-news/electric/heres-what-2030-petrol-and-diesel-car-ban-means>

But, continues the report, in the UK 'People are buying EVs (Electric Vehicles) voluntarily. Sales of full EVs and of PHEVs each tripled in October 2020 versus the same month in 2019. Combined, they're now one in seven of all the new cars sold, very similar numbers to diesels. For some brands it's higher – a quarter of October's Mercedes sales were EV or PHEV. The number of charging points is also going up fast. Networks ubitricity and Chargy are putting points into lamp-posts – thousands of them already. These as well as more conventional street-side public boxes are great for overnight or daytime charging for people who are at work, or who don't have a charge point at home.'

So...we can expect the trend to EV's will continue on a global scale. Does this mean the need for tribologists will decrease with the simplicity of the EV mechanism?

Says **Dr. Jean-David Wheeler, Engineer in modelling at SIMTEQ** in a Tribonet report – "Battery, motor, reducer, wheels. Over. No moving parts in the battery, a few bearings for the motor and the transmission line, and here is a new car! This apparent simplicity explains the expansion of newcomers in the previously small world of car manufacturers."



Wheeler continues – "However, the two mechanical systems are so different that using existing lubricants optimised for ICE (Internal Combustion Engine) in EV is at best not efficient and at worst dangerous. It is not efficient because the load and the relative motion of the mechanical components are not the same. It is dangerous because the lubricant not only flows within a steel and aluminium environment, but it also spreads on copper and polymer components. Besides, the lubricant also needs to ensure a

completely new function in EV! Lubrication in EV is probably not simpler, but it is certainly different."

For more on this view on the future which will most certainly and eventually arrive here, please visit

<https://www.tribonet.org/electric-vehicles-less-challenges-for-tribologists/>

SAIT Events

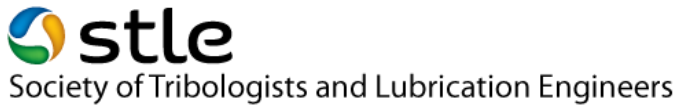


SAIT Membership Fees: A reminder that SAIT Membership Fees for 2021/22 are due at the beginning of March 2021; relevant invoices will be emailed in March.

If you have not yet paid your fees for 2020/21 and are able to do so now, please send us Proof of Payment to ensure that your membership remains current.

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.



Every Wednesday, a new recorded webinar is available for free to all STLE Members. We also provide links to TLT articles related to the webinar topic. For more information, please go to:

https://www.stle.org/WebinarWednesdays?utm_source=Real%20Magnet&utm_medium=email&utm_campaign=156033357

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.

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](#)

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](#).

Please note this international fuel event:

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| <p>13th International Colloquium Fuels 15-16 September 2021 Ostfildern Stuttgart Germany Call for Papers Submit abstracts at www.tae.de/go/fuels by 21st December 2020.</p> |
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Contamination Corner



Any action is preceded by thought. In the not too distant past the abiding perception was that if a thought was committed to writing it was probably the truth. Unfortunately, this perception has been destroyed. The recent election process in the USA has assured the creation of an 'alternate universe of disinformation'. This has also been mentioned in the media as 'truth decay'.

The tribological universe is not exempt from fake news, snake oil doctors, false product claims and conspiracy theories. The fact is that if enough people perceive a contaminated product claim to be the truth it becomes the truth. That is why tribology needs products that can stand up to tested standards.

Tough economic times give rise to many schemes to maintain living standards. One such abuse of product standard is filling used oil containers with subgrade product and charging the premium price. If the container seal is not broken in front of you at a filling station, what are you getting?

It all starts with the thought that creates intent and ends in action:

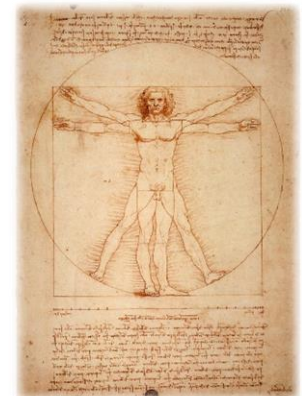


Contaminated Thinking Does Not Belong in Tribology!



The First Tribologist: Did You Know??

Leonardo di ser Piero da Vinci the famous Italian engineer, architect, painter, musician and mathematician can also be considered as The First Tribologist! Although the term itself was invented approximately 450 years after Leonardo da Vinci (1452-1519), he was the first one to perform the systematic study on friction, as pointed out by Professor Ian Hutchings. His sketches are widely known among tribologists and Vitruvian Man by da Vinci can be recognized in the logo of tribonet.



tribonet

In a recent paper in a Wear journal, after a thorough examination of the widely dispersed across Europe 'mirror writing' notes and puzzling sketches of Leonardo, Dr. Hutchings concluded that the results achieved almost 500 years ago were outstanding. Extraordinary inventor Leonardo had not only understood, but also applied the fundamental laws of friction (currently known as Amontons) to the solution of practical problems. Remarkably sophisticated, Leonardo's understanding of friction included the appreciation of the influence of the materials and the lubrication state on the friction coefficient and the values of $1/2$, $1/3$, $1/4$ and $1/8$ were encountered in his notes.



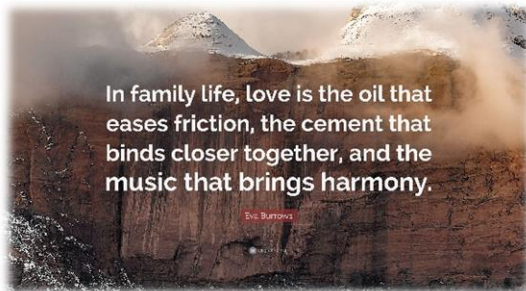
Having analysed the notebooks, Professor Hutchings concludes that Leonardo's interest and understanding of friction was deep-rooted and more sophisticated than it was suggested. Despite the fact that these notes remained unknown until relatively recently, Leonardo da Vinci is a remarkable pioneer of tribology,

Leonardo da Vinci – The First Tribologist!

<http://www.tribonet.org/who-is-the-first-leonardo-da-vinci/>

From the President's Desk – Patrick G. Swan

December 2020 found us at the end of a tumultuous year where our economy fell through to junk status, and then was hammered by the COVID-19 pandemic that has added to business closures and unemployment.



Now the Christmas and festive season is past, with quality family time enjoyed.

This is a time to consider the past year and set plans for the new, remembering that tribology is the science of friction and wear:

keep friction out of your family gatherings, or it will wear you down



Parting Shot!

**A Tender Process has the Intention of Best Spec at a Fair Price!
But what happens in practice...**

Why tenders fall over:

- To ensure that the total cost of ownership / cost of production is minimised, **a holistic approach needs to be taken.**
- When working in 'silos' and trying to reduce the costs in individual budgets, **the bigger picture is often missed.**
- Tenders are often issued, based on products currently used, rather than the **operating environment and the specifications required.**



- This results in 'older' technologies being procured as the **better performing lubricants are either not submitted for evaluation or are excluded on price.**

A rethink on the tender process needs to be taken to review the total cost of lubrication, rather than the total cost of the lubricant. Specifications (performance) need to be continually evaluated to ensure that the most suited product is procured and not just the cheapest.

Another thought from John Fitton

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.