

SAIT Technical Newsletter, July 2021



SAIT Office Hours

SAIT's Office Hours: 09:00 – 15:00, Mondays to Thursdays; Fridays we work from home.
Telephone No. 011 804 3710: If no answer, please email secretary@sait.org.za

Bringing the SAIT Executive Committee Closer to SAIT Members and the Wider Tribological Community.

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The SAIT Mission:

"To promote technology transfer, whereby local tribological problems can be solved and products improved."

SAIT President: P.G. Swan

SAIT Directors: D.P. Beard (British); L.E. Bradley (British); J.C.G. Claasen.

Tribology



Tribology is falling under the spell of climate change. The world's automobile manufacturers are declaring their intent to cease combustion engine production to be replaced by electric cars. Press reports carry the fact – 'VW to end sale of combustion engine cars in Europe by 2035'. And further: 'The Volkswagen brand of the Volkswagen group, which owns other brands, would increase its share of electric vehicles to 70% of total sales in the region by 2030'. The Volkswagen brand has annual deliveries topping six million.

Engineers working on Electric Engines (<https://www.fuelsandlubes.com/vw-to-end-sale-of-combustion-engine-cars-in-europe-by-2035/>)

The report in Fuels & Lubes goes on – 'Whereas the timeline for the U.S. would be similar to Europe, the phase out in China will come later. Africa and South America would take significantly longer due to lack of charging infrastructure.' Vast quantities of lube oils for IC engines will no longer be needed...

But there are other frictional issues that will take place where the rubber meets the road. Electric drive trains produce massive and instant torque which will impact on tyre design and engineering, and then on the road surface with hundreds of thousands of wheels transmitting Nm (Newton metres) to get moving. What may appear as an easy solution will open the door to other challenges.

Please visit: <https://www.fuelsandlubes.com/vw-to-end-sale-of-combustion-engine-cars-in-europe-by-2035/>

SAIT Training

For full SAIT Training information Please review <http://sait.org.za/events/training/>.

Introductory Courses on Lubrication Engineering and Wear and Materials

If you are interested in attending one of our 1-day Introductory Courses, email us at secretary@sait.org.za or admin@sait.org.za.

A certificate of attendance will be awarded to delegates who complete each course. Delegates will also earn 0.8 CPD Credits, as the courses are registered with ECSA.

Lubrication Engineering 132 – Cape Town

Because of Covid-19 Regulations and the unpredictability caused by the Pandemic, the SAIT is considering moving this course to Johannesburg and combining it with LE 131.

If you are considering registering for LE 132 in Cape Town, this is your last chance.

The form can be downloaded at

http://79.170.40.230/sait.org.za/rw_common/plugins/stacks/armadillo/media/LE132CT30Aug3Sept2021RegForm.pdf, or contact admin@sait.org.za or secretary@sait.org.za.

Lubrication Engineering 131 – Johannesburg

LE 131 is scheduled for 26-30 July in Johannesburg. If you wish to register for LE 131 in Johannesburg, please do so as soon as possible, this course is only 2 weeks away. The form for LE 131 can be downloaded at

http://79.170.40.230/sait.org.za/rw_common/plugins/stacks/armadillo/media/lube131jhb.pdf, or contact admin@sait.org.za, or secretary@sait.org.za.

SAIT Events

SAIT 2021 AGM:

The 37th Annual General Meeting is scheduled, online via Zoom, for Wednesday evening 4th August 2021 at 18:00. We will send out the required notice, and all documents in good time. Please keep an eye on our website at <http://sait.org.za/events/agm/>. This will be updated shortly and continually as preparations proceed. Members wishing to attend, please email Isabel Bradley, the SAIT Secretary, at secretary@sait.org.za; the Zoom Invitation with the required link will be sent to you in due course.

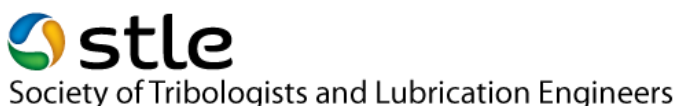
SAYTA, Under the Auspices of SAIT:

To promote Tribology among younger people in tribology related industry, the South African Young Tribologist Association (SAYTA) was recently formed. The aim of this group is to function as a support network between young individuals working in tribology and related industry, also linking young members to experts in the industry. This will ensure continuity in the transfer of knowledge and experience. The group will also focus on addressing current issues experienced in industry. SAIT members already qualify, at no extra cost, to become a member of SAYTA.

Watch the SAIT Website at <http://www.sait.org.za/membership/page/> as the group forms and progresses.

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, 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

Please note this international fuel event

13th International Colloquium Fuels
15-16 **September 2021 Ostfildern Stuttgart Germany**
In person and online – a hybrid event.



20 Minutes with Kian Kun Yap and Manoj Murali

by Rachel Fowler, Publisher/Editor-in-Chief
TLT - 20 Minutes July 2021



Injuries from Continual Wearing of Facial PPE

Two doctorate students from Imperial College London discuss their research on PPE-induced skin injuries among healthcare workers.

TLT: How did you come across the PPE-induced skin injuries problem suffered by COVID-19 frontline medics?

Yap and Murali: During the height of the COVID-19 pandemic in April 2020, the Biotribology team at Imperial College London, led by Dr. Marc Masen, noticed a huge number of media reports on healthcare workers suffering from awful facial injuries. This was caused by the need to wear PPE for extended hours beyond the recommended usage time. The skin injuries not only cause pain and discomfort among medics but may potentially provide a dermal pathway for bacterial and viral infection.

Due to our prior experience on pressure-induced skin injuries research, we immediately recognized this to be a skin tribology problem. The only advice available was to apply petroleum jelly at 30-minute intervals, which would not be possible whatsoever in a COVID-19 ward setting where you simply cannot remove PPE with any frequency. Having seen the problem, there was a need to improve the medical recommendations given to healthcare workers to avoid these injuries.

As tribologists, we wanted to make use of our expertise in solving this problem for healthcare workers who have been risking their lives to combat the pandemic. The Imperial College COVID-19 Response Fund allowed us to put money toward testing and other resources. From there, we gathered a team of around 30 engineers and clinicians to accelerate the research of possible solutions, which could alleviate PPE-related skin injuries.

TLT: How are these PPE-induced skin injuries related to tribology?

Yap and Murali: Prolonged use of tight-fitting PPE such as goggles, visors and respirator masks among COVID-19 frontline medics can cause various skin injuries (e.g., contact dermatitis, urticaria, skin tears, blisters and

pressure ulcers). If we observe the facial skin injuries among medics closely, you will find that these injuries mainly develop at the nose bridge, cheek bones and forehead. This is because shear stresses and strains tend to concentrate at bony prominences. Although wearing PPE can introduce both normal and shear loads on our skin, our skin is robust against normal loads but vulnerable to shear loads. The shear load is caused by the static friction that prevents the PPE from sliding against our skin. Excessive shear on the skin surface can cause significant tissue deformation and cellular distortion, leading to injuries. At the same time, shear loading reduces blood perfusion and the transcutaneous oxygen level in our skin. This weakens the integrity of the tissue, making our skin more prone to injury. Therefore, the key to alleviating PPE-induced skin injury is by minimizing the shear or friction at the skin-PPE interface.

Main Project Contributors

Principal investigator: Dr. Marc Masen

Lubricant development team: Kian Kun Yap, Manoj Murali, Dr. Zhengchu Tan, Xue Zhou and Luli Li

Skin-PPE modeling team: Rikeen Jobanputra, Sravani Royyuru and Jack Hayes

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You can reach Manoj Murali at manoj.murali15@imperial.ac.uk.

Read the Full Article, reprinted at <http://www.sait.org.za/conferences/newsletters>, with permission, from the July 2021 issue of TLT, the official monthly magazine of the Society of Tribologists and Lubrication Engineers, an international not-for-profit professional society headquartered in Park Ridge, Ill., www.stle.org



Contamination Corner

HOW CONTAMINANTS AFFECT ADDITIVES

Particle contamination in a lubricating or hydraulic system is widely known as one of the most devastating contaminants. **One effect of particle contamination that is rarely discussed is additive leaching.** Many additives attach to particles and are removed, along with the particle, by filtration.

Please visit <https://www.wearcheck.co.za/info/lube-tips.html>

It's worth repeating: Contamination control is a partner of RCFA – Root Cause Failure Analysis – it's not just what is visible, and it is worth digging deeper.

FAQS – Did You Know?

A couple of frequently asked synthetic lubricant questions that impact on friction:

- **What is synthetic oil?**

Previously, synthetic oil was defined as an oil base stock that was formulated in a laboratory rather than crude oil from the ground that has been refined. However, these days the term 'synthetic' is

purely a marketing term that denotes an oil of very high quality. Synthetic base stocks can either be synthesized in a laboratory or produced from very highly refined and processed mineral oils. Both 'mineral' and 'synthetic' oils contain additives.

- **Do high-price synthetic oils work?**

Yes. However, because of their high cost, the benefits of using them should be balanced against the expense, taking into account the cost of the lubricated component, the application and the working environment. Synthetic oils generally protect components from high temperature operation but cannot protect them against contamination like dirt and water.

<https://www.wearcheck.co.za/info/faq/faq-oils.html>

Call For Lube Standards Grows Internationally

Tim Sullivan, Executive Editor at Lubes'n'Greases/LNG reports that the Saudis have formed a lubes business group charged with tasks such as combatting the use of fraudulent products. Saudi Arabia's main business association, The Federation of Saudi Chambers of commerce announced June 22 that it had formed the National Committee for Lubricants and Base Oils, which held its inaugural meeting on the same day in Jeddah, according to several local news organizations.

Illustration found at <https://www.lubricants.com/reliability-solutions/lubricant-identification/>

A committee will promote reforms for the nation's finished lubricant and base oil markets, Chairman Samir Nawar said the committee hopes to increase sales volumes for legitimate suppliers by as much as 20% by discouraging use of fraudulent lubricants.

The federation is an umbrella organization of regional chambers of commerce and committees representing specific sectors of the Saudi economy. The lubricants and base oils committee was created at the request of numerous businesses.



It is charged with a number of tasks, including reducing dependence on imports, raising the quality of products on the market, enhancing consumer understanding of lubes and recognition of products made domestically and boosting capacity of domestic blend plants. Officials said the group will also promote recycling of used lubricants.

Please visit <https://www.lubesngreases.com/author/tim-sullivan/> and <https://www.lubesngreases.com/lubereport-emea/saudis-form-lubes-business-group/>

From the President's Desk – Patrick G. Swan

The quality of lubricants in South Africa, and the SADEC community, are self-regulated by the lubricant blenders and marketers. This means that lubricant blenders and marketers



have a free hand in claiming the performance specification of their lubricants that are sold, and there is no watch dog to ensure that the actual performance is the same as the claimed performance. In many cases the lubricants that are sold in South Africa do meet the quality that is claimed on the can or drum, but in far too many cases the detailed performance specifications are not met, and in many other cases the claimed performance level has been found to be false.

The SAIT is deeply concerned about the actual quality of lubricants sold in South Africa and has made little progress after many years of trying to work with the South African Bureau of Standards to rectify the situation. As a result, the SAIT has taken upon itself to establish a functional system for South Africa that will ensure the quality of lubricants marketed in our area. In setting up the system we will be working with international organisations such as the United Kingdom based Verification of Lubricant Specifications (VLS).

The SAIT is a volunteer organisation and recognizes that to set up the functional organisation that is needed will require both time and the support of the lubricant marketers and consumers. It is clear that although the organisation will be established under the auspices of the SAIT, it will not entirely be staffed by volunteers. We look forward to being of greater service to our members.



Parting Shot!

Fuel lubricity – a burning issue

With the high cost of energy (fuel) and taxes imposed on automotive fuels, there is a sector that is trying to reduce costs.



Tribology in the fuel system, under high pressure or 'fuel lubricity' is critically important in automotive diesel, but it is not the only parameter that needs to be considered when testing a fuel for its 'fit-for-purpose' nature. The typical QC checks conducted by the industry are only high-level checks and do not guarantee fit-for-purpose nature of the fuel and premature failure could still occur, even if the density, viscosity, lubricity etc are within the legislated specifications.

To ensure saving, check that properly tested and additised fuel is used that will reduce monthly fuel use and by ensuring efficient operation, the maintenance bill as well.

We Want to Hear from YOU

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



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