

SAIT Newsletter, April 2020

The SAIT

During the Corona Virus-Covid19 Pandemic and Lockdown

The SAIT is fully aware of the Corona Virus-Covid19 pandemic, and will continue to follow all guide-lines issued by the Government as strictly as possible.

We are currently working from home; if you have any queries, please contact us at either secretary@sait.org.za or at admin@sait.org.za.

We will continue to keep everyone advised of any changes as they arise.

2020 Training: We are taking bookings for and preparing our scheduled Lubrication Engineering courses through the year.

Should the current Lockdown be extended into May and beyond, the affected courses will be re-scheduled or cancelled as necessary, and delegates' bookings and fees will be carried forward to the next available course that they are able to attend. This will also apply to delegates who are impacted by South African Border closures and those who need to isolate or go into quarantine.

We wish everyone continued health and productivity.

Prevent the Spread of Corona Virus: Apply Tribology During the Pandemic

Friction and Lubrication:

Wash your hands with soap regularly and frequently. Soap adds lubrication when you rub your hands together; it seeks out and adheres to viruses that could be on your hands. Rubbing the cleansing soap, down each finger, into the joints and finger-nails and down to the exposed parts of your wrists collects all contamination, which is then washed away with a clean stream of water.

The WHO recommends that we wash our hands after visiting the toilet, before and after touching surfaces and before and after touching our faces, or other people!



Keep work surfaces clean; use a tissue to contain coughs and sneezes - and remember to throw it away when finished.

Avoid touching your face – if you need to scratch or rub, why not use a tissue!

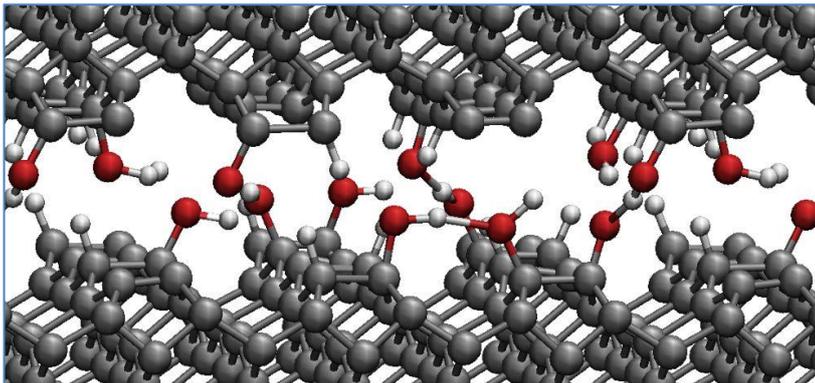
Avoid the friction of close-contact; don't touch other people except your nearest and dearest, with whom you are in lockdown.

We look forward to seeing you when the Lockdown is over and Corona-Covid19 is conquered.

Tribology on a Gigantic Scale

Tribology, on a gigantic scale, is reflected in the world's population with human activity as a frictional multiplying factor. Consider this global scene – more than seven billion people try every day to force over 1,5 billion cars and trucks to overcome the frictional resistance caused by gravity. There's huge friction energy being consumed not only in engines and drivelines but also in braking systems, where tyres meet road surfaces and move air out of the way. Then to top it all, add industrial engines, earthmoving equipment, agricultural tractors, power stations, airlines and shipping – there's an awful lot of friction taking place as you read this.

Of course, all this frictional activity is visible in the form of pollution, which has abated during the presence of Coronavirus in both China and Europe – proven in satellite imagery!



There is also the 'smaller' world of **Nanotribology** – Nanotribology, or molecular tribology, is one of the most significant components of tribology and is concerned with atomic and molecular interaction at a nanoscale, occurring upon the frictional contact of materials or lubrication. Nanotribology is defined as a fundamental research field of tribology viewed from the perspective of atoms and molecules.

*Picture from Tribonet's article: **Modern Applications of Tribology***

Atomic force microscopy and other surface analysis methods have enlarged the possibility to investigate friction and wear phenomena at the nano-Newton/molecular level. Advances provided the impetus for research aimed at developing a fundamental understanding of the nature and consequences of the interactions between materials on the atomic scale, and to guide the design efforts in industrial applications. They have led to the appearance of the new field of nanotribology and nanomechanics (Bhushan, 2007). <https://www.tribonet.org/wiki/nanotribology/>

Root Cause Analysis

RCA – Root Cause Analysis (RCA) – This well-recognised process identifies “**root causes**” of complications or incidents and a systematic method to analyse, record and respond. RCA is based on the premise that effective management does more than extinguish developing problems, but using RCA finds ways to stop them. And that is why oil analysis has a distinct partner in vibration analysis. It often all starts with vibration that magnifies frictional losses, resulting in energy losses, finally leading to excessive wear and failure.



“To address this mistake we need to utilise our thorough system of root cause analysis. I will begin, if I may, by pointing out that it's not my fault!”

SAIT Training

Follow the path from data to information and into knowledge.

Lubrication Engineering Courses, 2020

Please Note: as from January 2020, SAIMM is allocating 4 CPD ECS Credits to each of the SAIT 5-day Lubrication Engineering Courses.

Register now to ensure your place on these courses. There is still space available.

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

Should the current Lockdown be extended into May and beyond, the affected courses will be re-scheduled or cancelled as necessary, and delegates' bookings and fees will be carried forward to the next available course that they are able to attend. This will also apply to delegates who are impacted by South African Border closures and those who need to isolate or go into quarantine.

Please note that group photographs are taken and published.

Costs: SAIT Members: R17 135 Non-Members: R19 090 Students: R5 267

- **LE 126:** 25 to 29 May 2020, Johannesburg
- **LE 127:** 8 to 12 June 2020, Durban
- **LE 128:** 27 to 31 July 2020, Johannesburg
- **LE 129:** 24 – 28 August 2020, Cape Town
- **LE 130:** 19 to 23 October 2020, Johannesburg.

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

The **Technical Meeting** proposed for **7 April 2020** has been indefinitely **postponed** because of the National Lockdown.

SAIT AGM, 2020: While the National Lockdown progresses, the SAIT continues to plan its AGM to be held on 5 May 2020, followed by a Technical Meeting.

Should the National Lockdown be extended past 16 April and into May or later, we need to prepare the AGM and Technical Meeting as a Webinar, or possibly more efficiently, as a Video Meeting. We are looking for solutions that we will be able to manage online; we will welcome your assistance and guidance, sent to admin@sait.org.za and secretary@sait.org.za.

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

The SAIT's 2020 Annual Awards Dinner, scheduled to be held on **Friday evening 15 May 2020** at Cedarwoods of Sandton. Members and their guests are welcome. *Should the National Lockdown be extended, this event **may be postponed or cancelled**. We will keep you informed.* Further details and a booking form will be made available when finalised.

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

Contamination corner – According to Noria.com the cost of excluding a gram of dirt is probably only 10% of what it will cost once it gets into oil. A contamination source is not necessarily the usual suspect – this is where RCA gets into gear. Some preventable ways that contaminants get into oil include:

- New oil
 - Ventilation and breathers
 - Seals
 - Wear generation
 - Service and manufacturing debris
 - Filter dumping
 - Wash-down sprays and solvents
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SA Mechanical Engineer's SAIT Supplement

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SA Mechanical Engineer's SAIT Supplement

Our Corporate Members may already have heard from Louise of the SA Mechanical Engineer about the special SAIT Tribology Supplement for the coming issue. If you are an individual member of SAIT, running a small tribology-linked business, you, too, can take advantage of the special offer of an information block in the coming SAIT Supplement.

We are asking for your support by taking an advert in this supplement, just a small ad for R 2000 listing your company, contact details and what you do. This will be a great help in promoting the SAIT and also giving you exposure for your company.

Please contact Louise directly at samecheng@promech.co.za. Their website can be reached at SA Mechanical Engineer



Did You Know?

Did you know that 'Vacuum Has Friction and Soon It Will be Measured'? (From Tribonet)

A team of physicists at Purdue University has created the fastest spinning object ever made, taking them much closer to being able to measure the mysterious **friction** forces inside **vacuum**.

This object is a small ball made of silica, which can rotate around billions of times per second and that can be used as a sensor capable of measuring torque forces to a quadrillionth of a newton-meter. This is around 700 times more sensitive than was possible with the existing technology. The device provides sufficient sensitivity to be able to detect the small amounts of drag caused by the friction within vacuum.

By using a 1,550-nm laser beam, the researchers suspended 150 nanometer silica nanoparticles in vacuum. The physicists had to fine-tune the device to make the particles levitate and to apply spin. The spin is applied using polarised pulses from a second laser. The spin achieved is incredible – 300 billion rotations per minute (rpm) – the fastest man-made rotation ever created. For a comparison, the fastest motors of Tesla (and also Formula 1 vehicles) rotate with a maximum of around 18,000rpm. For more of this futuristic subject at a Nano level, please visit <https://www.tribonet.org/vacuum-has-friction-and-soon-it-will-be-measured/>

Parting Shot

from

**Jason Tranter, CEO Mobius Institute,
Chairman of the CBM Connect Conference held in Sandton
From 10-12 March 2020.**

Tranter looked to the future with the following the questions – “What is the future for vibration technicians and analysts? What will become of the person collecting the data?” Tranter continued – “It is too expensive to ‘instrument’ every machine, but prices are coming way down. Wireless technology and MEMS sensors will make it far more affordable.”

What is a MEMS Sensor? MEMS are low-cost, high accuracy inertial sensors used to serve an extensive range of industrial applications. This sensor uses a chip-based technology namely micro-electro-mechanical-system.

When asking what will become of the person collecting data, Tranter said “there is a lot of value in having someone visit the machine. Simple data screening should go away as will first pass analysis. Analysts will teach the system about unique machines, review-validate and verify reports, perform special tests and provide more of a reliability focus. This will result in far more machines being tested, with time for special tests.”

Tranter concluded – “This is the time to improve diagnostic, troubleshooting, analytical and reporting skills. It’s time to learn other condition monitoring technologies and work towards reliability improvement. ***Don’t just detect condition monitoring problems – avoid them!***”

Condition monitoring and tribology are bound up in a symbiotic relationship.

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.