The South African Institute of Tribology
understanding friction, lubrication and wear

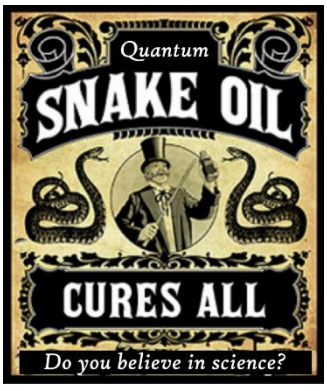
SAIT Newsletter, December 2019

The SAIT Offices will close for the Holiday Season

on 13th December 2019, and will re-open on 7th January 2020.

We wish all our members and supporters safe and happy holidays and look forward to a productive 2020.

Tribology is intolerant of 'snake oil'. As a science, tribology is concerned with validated facts and truth – there is no place for 'fake news'. However, where enforceable standards are absent alongside a culture of greed with no ethics, we will have sub-grade products claiming false performance factors. Ignorance (and corruption) let price rule the day.



A Google visit shows 107,000,000 (in 0,49 seconds) results for 'snake oil'. The subject is both serious and entertaining. There are two dictionary definitions for this informal noun that originates in North America

- A substance with no real medicinal value sold as a remedy for all diseases – 'some kelp products are snake oil, but the good ones promote plant growth'
- A product, policy, etc. of little real worth or value that is promoted as the solution to a problem – 'the new tax plan was denounced as snake oil'

For a detailed exposé on potions and devices please visit a 2009 Car Magazine article https://www.carmag.co.za/technical-blog/fuel-impotent-potions/ - after 10 years it is still very relevant.

ETT – Essential Tribology Terminology

Three of Tribology's terms that are used and agreed upon:

Viscosity is the resistance to flow or thickness of a liquid. The viscosity of liquids tends to decrease with an increase in temperature. It is therefore essential to specify the temperature at which a viscosity must be measured. Viscosity is now expressed in kinematic units of mm^2/s or dynamic units of mPa's but the following units have traditionally been used and will often be encountered

Centipoise	CP	A derived unit of dynamic viscosity
Centistoke	cSt	A derived unit of kinematic viscosity

Viscosity Index (VI): An arbitrary number used to characterize the change of the kinematic viscosity of a petroleum product with temperature. In the case of oils of similar kinematic viscosity, the higher the viscosity index the smaller is the effect of temperature on their kinematic viscosities. It is a widely used measure of the variation in kinematic viscosity due to changes in the temperature of a petroleum product between 40ºC and 100ºC.

Viscosity Index Improver: An additive that reduces the tendency of the viscosity of an oil to change with temperature.

SAIT Training

Follow the path from data to information and into knowledge

In-House Training, Palabora Copper Mine

Delegates at the In-House Lubrication Engineering Course, Palabora Copper Mine, with Lecturer, David

An In-House Lubrication Engineering Course was run by Lecturers, Patrick Swan and David Beard of the SAIT Executive Committee, administered by SAIT Secretary Gill Fuller, from 14 to 18 October 2019. We congratulate all twelve delegates on passing; special congratulations go to the five who achieved distinctions of 75% and more: they were Thando Twala, Carl Coetzee, Leander Steenkamp and Tsundzukani Mabaso.

Lubrication Engineering Courses

- **LE 125:** 24 to 28 February 2020, Johannesburg

Book your place now to train in February 2020 at our 2019/20 rates:

Costs: SAIT Members: R16 031 Non-Members: R17 894 Students: R4 922

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NB: From May 2020, all courses will be at revised 2020/21 rates:

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

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

SAIT Training Schedule, remainder 2020

- **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, Cape Town
- **LE 130:** 19 to 23 October 2020, Johannesburg.

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The STLE's CLS, OMA and CMFS Examinations at SAIT

stle
Society of Tribologists and Lubrication Engineers

Hosted by The SAIT in 2019:

The Sait again hosted the CLS and OMA exams of the STLE at Science Park in 2019. 9 Candidates wrote on 22nd December. We have not yet had results; the STLE is expected to release results directly to the candidates early next year. Our thanks to Prof. CS Kucukkaragoz of Wits University for once again invigilating these exams.

Prof. Kucukkaragoz

David Beard

Candidates, concentrating while writing the exams

The SAIT also hosted the CLS Overview, supervised by SAIT Committee Member David Beard prior to the course by email from October and at Science Park on 20th and 21st December. Henco Booysen, one of the delegates, wrote:

"I would just like an opportunity to thank you … for the great effort and … time you put into the CLS preparation course. You … are great fun to work with and … always make me feel at home. I am honored to be a part of such an incredible institute and will definitely put more effort into becoming actively involved. Thank you and keep up the good work!!" Thank you, Henco, for your continuing support."

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Hosted by The SAIT in 2020:

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

Tuesday 3 March 2020,Technical Meeting:

"Challenges at the Railway Wheel-Rail Interface
Related to Friction, Lubrication, Wear and Friction-Induced Noise"
presented by Dr Danie Fourie, Senior Engineer, Transnet Rail.

For the full details, please see our next newsletter in the New Year.

International Events:

January 2020: the **22nd International Colloquium Tribology** will take place at the Technische Akademie Esslingen. The conference provides an international exchange forum for the industry and the academia. Leading university researchers present their latest findings, and representatives of the industry inspire scientists to develop new solutions. Discussions and co-operations enable attendees to meet current tribological challenges. One of the main topics is the forthcoming e-mobility technology, its various aspects and its consequences for the lubrication and tribology community.

The following have been sourced from upcoming events at www.tribonet.org

- **19 – 22 April 2020:** 2nd Korea-Tribology International Symposium
- **27 – 29 April 2020:** 3rd African Conference in Tribology
- **03 – 7 May 2020:** 75th STLE Annual Meeting & Exhibition
- **04 – 5 May 2020:** 4th International Conference on Materials Science and Engineering
- **13 – 15 May 2020:** Contact Mechanics International Symposium 2020

Tuesday 8 – Thursday 10 September 2020: 47th Leeds-Lyon Symposium on **Tribology for a Sustainable Future University of Leeds, Leeds, UK.**

The deadline for the submission of an initial one-page abstract for oral presentation is Monday 24 February 2020. Offerings of original research are requested in (but not limited to) the following areas:

- sustainable and green lubricants
- novel materials with advanced tribological performance
- advanced measurement and simulation methods
- interface life-cycles
- sustainable interfacial design
- industrial application of these technologies

Registration via the Online Store will open on Monday 6 April 2020.

Keynote Speakers:

- Dr Tabassamul Haque, ExxonMobil, USA
- Professor Roger Lewis, University of Sheffield, UK

Key dates:

- Monday 24 February 2020: Submission of initial 1-page abstract for oral presentation
- Wednesday 29 April 2020: Notification to authors of oral abstract acceptance
- Monday 22 June 2020: Submission of 1-page abstract for poster presentations
- Wednesday 8 July 2020: Notification to authors of poster abstract acceptance
- Monday 20 July 2020: Submission of final 1-page abstract for oral presentations
- Tuesday 30 July 2020: Submission of paper to chosen journal

Sunday 5 – Friday 10 September, 2021 – SAVE THE DATE! It is a great pleasure to invite you to join the **7th World Tribology congress (WTC 2021)** to be held in **Lyon, France September 5-10, 2021.**

WTC 2021 aims to highlight recent important progresses in all aspects of Tribology, to strengthen the links between academy and industry, to provide a unique opportunity for discussion concerning the latest developments in Tribology and to promote international collaborations and exchanges. The Congress will consist in **scientific sessions, keynote talks** and **symposia** on topics at the cutting edge of various aspects of Tribology, a wide **exhibition** and additional events – scientific and non-scientific. We look forward to welcome you at WTC 2021!
Phillipe VERGNE and Philippe KAPSA are the General Chairs.

Abstract submission: Opens March 2020
Early-Bird Registration: Opens September 2020

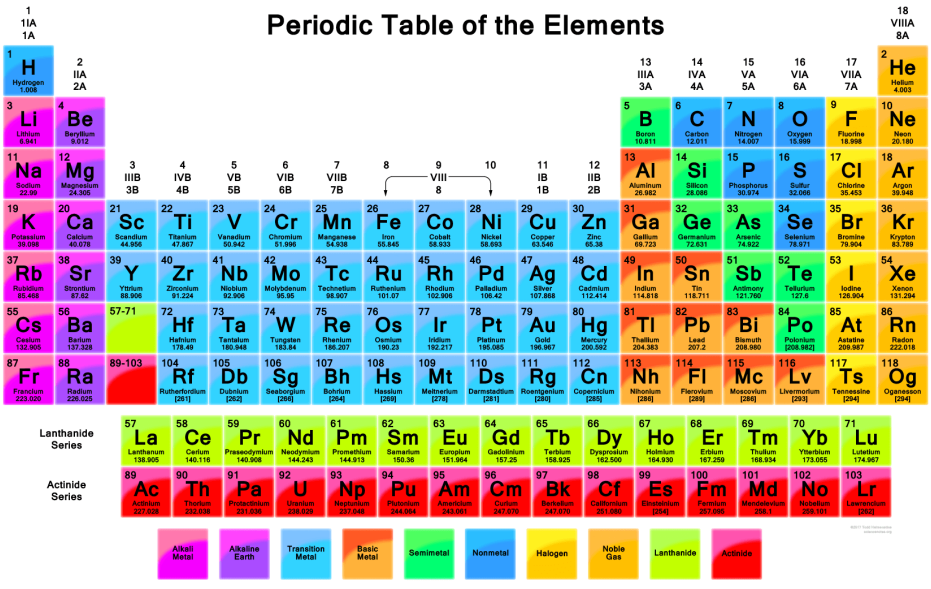
Website: www.wtc2021.org

For further information, feel free to contact us at: General Information – contact@wtc2021.org or Sponsorship & Exhibition – sponsor@wtc2021.org.

Contamination Corner:

What is silicon, silica and silicate?

The presence of silicon in oil is associated with the presence of air-borne dust or dirt. Dirt is not pure silicon, but silicon combines with oxygen (and other elements) to form a family of compounds known as silicates or pure silicon dioxide (also known as silica). Silicon is element 14 in the periodic table and found towards the upper right-hand part of the table. It is a metalloid, which means that it is not wholly a metal or a non-metal but has characteristics of both groups of elements; it is chemically similar to carbon. Silicon is the eighth most common element in the universe but the second most common element in the earth's crust after oxygen, and has a melting point of 1410˚C.

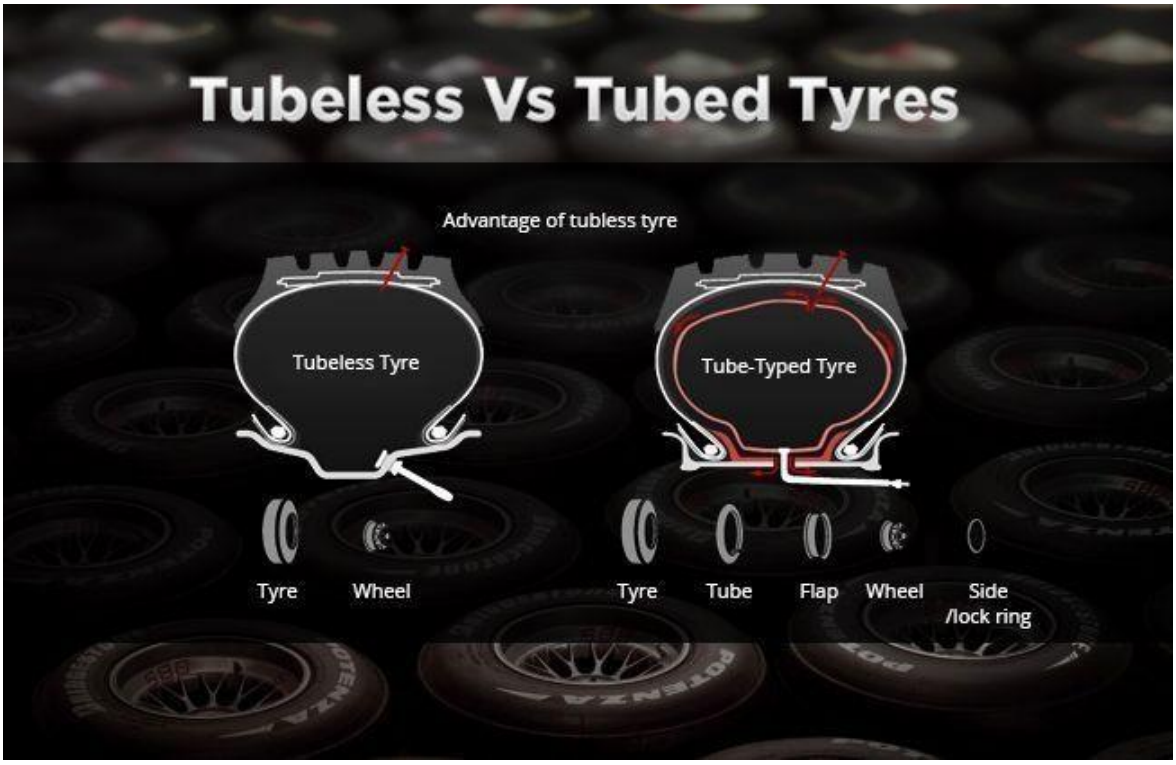


Unfortunately for the oil analyst, seeing silicon in an oil sample does not always mean that dirt is present; silicon can have many other sources. For a detailed overview of silicon, silicates and sources of silicon please visit a 6-page technical bulletin, SOS: Sources of Silicon, prepared by John Evans, Diagnostic Manager at WearCheck.

Did You Know?

Did you know that reducing friction *inside* a tyre is a safety factor?

No unwanted friction in Tubeless Tyres: While driving at high speeds, a tubed tyre will have friction within itself. This increases the tube temperature and there can even be chances of the tube exploding. A tyre/tube explosion at high speeds calls for disaster. Tubeless tyres do not pose this risk.



Also, since a tubed tyre has more components (tyre, tube, rim) compared to a tubeless tyre (just tyre and rim), performance and efficiency are better with a tubeless tyre.

Read more at the DriveSpark article, **Expert Talk: The Main Advantages & Disadvantages Of Tubeless Tyres By Rajkamal Narayanan.**

PARTING SHOT

Tribology is an essential partner of energy efficiency.

(Observation from a serious tribologist)

When energy efficiency is mentioned, most people think about electricity usage and switching off something. However, energy efficiency improvements continue to be a significant tribological challenge in the lubricant industries.

There is considerable R&D that is ongoing in these sectors, but simple changes can have big impacts in energy consumption, from tyre choices to engine and transmission lubricant, and pump and motor lubrication; and even heat transfer fluid selection can have significant impacts.

Many areas are being examined to increase energy efficiency in lubricants. One such area is the base oil that is used in the lubricant formulation. The impact of base oil can be significant on the frictional differences in a lubricant using PAO and Group III base oils. The chemical and physical property differences can be

shown using the Stribeck and Traction curves determined with measurements using a Mini Traction Machine (MTM). Relating the differences in friction to the energy efficiency can be estimated based upon different lubrication regimes measured with the MTM.

The estimated improvements for the overall energy savings from a friction perspective only between group III and PAO (synthetic) are in the range of 0.7% to 1.4% based on this model.

We Want to Hear from YOU!

1. Please let us know what topics are of interest to you, or submit interesting articles that we can share with the SAIT community. This will assist in disseminating information to all involved in Tribology. Please send your thoughts to admin@sait.org.za for forwarding to The Editor.

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.