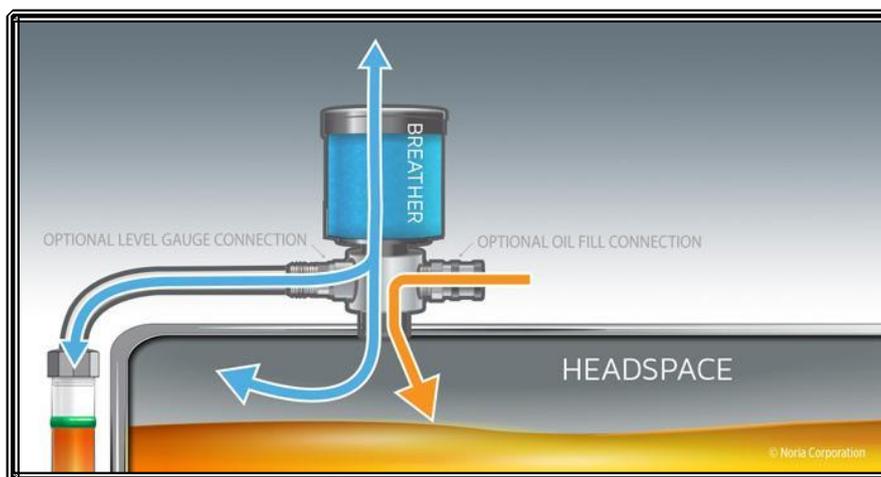


SAIT Newsletter, November 2019

Tribology requires an integrated approach to really understand what is happening at a frictional level. And this is so true for the humble breather that gets overlooked when everyone is focused on a failure, blaming this on a lubricant as the evolving victim of a faulty breather. Too many breathers are unfiltered and un-serviced.



Extract From: <https://www.machinerylubrication.com/Articles/Print/31566>

Global estimates are that over 1 billion passenger **cars** travel the streets and **roads** of the world today. That figure excludes trucks, buses, diesel power plants and construction vehicles – every one of these powered units needs to breath, creating yet another environmental challenge. The fetid breath of internal combustion engines is not only emitted from exhaust tailpipes but also from the sump pressure of moving machinery through breather pipes. In many cases the breather is unfiltered.

And when it comes to friction in engines, gearboxes and axles, contamination is the enemy to be excluded – especially moisture and particles. This is where a filtered breather plays a major role.

Since we know at least half of lubricant contamination comes from outside machinery and most machines are designed to "breathe," it's a good idea to stop these contaminants at the source. Enter desiccant breathers.

For more details please visit [Desiccant Breathers: A Complete Guide](#)

and download the 13-page article.

ETT – Essential Tribology Terminology

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

- **Total Base Number (TBN)** The quantity of acid, expressed in terms of the equivalent number of milligrams of potassium hydroxide that is required to neutralize all basic constituents present in a 1g sample. TBN is the quantity of hydrochloric (ASTM D974) or perchloric (ASTM D2896) acid expressed in milligrams of KOH equivalent that is required to neutralize all the basic constituents of a one-gram sample of a petroleum product. This property is used to indicate the capacity of an oil to counter the corrosive effects of acidic products of combustion.
- **Tribology** The science of the interactions between surfaces moving relative to each other. The branch of tribology concerned with the reduction of friction between surfaces is covered by the field of lubrication technology.
- **TWC** Three-way catalyst, used for reducing toxic emissions from petrol engines.

SAIT Training

Follow the path from data to information and into knowledge:

The final Lubrication Engineering Course for 2019, LE 124, took place at [CedarWoods of Sandton Conference Centre](#) from 30 September to 4 October.



Delegates at LE 124, 30 September to 4 October, with Lecturer, SAIT Administrators Gill Fuller and Berice Fayard

Of this group of 26 delegates, 24 passed, 12 of whom achieved distinctions – congratulations to all. Those who achieved distinctions were: Bonolo Khutswane, David Mwesigwe, Howard Benadé, Jean-Pierre Potgieter, Ben Mabelane, Kagiso Mogapi, Percy Kolisi, Museveni Phiri, Heiko Hansen, Moses Letshane, Andile Dladla and Vanishree Naidoo – well done!



The five international delegates at Lubrication Engineering 124 were:
Heiko Hanson of Ohorongo Cement, Tsumeb, Namibia;
Kennedy Musonga, Mary Mwangelwa and Museveni Phiri of Spectra Oil Corporation, Lusaka, Zambia;
and David Mwesige of Vivo Energy, Kampala, Uganda.

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In-House Training, Palabora Copper Mine

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. A full report-back will appear in next month's SAIT Newsletter.

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SAIT Training schedule for 2020

- LE 125: 24 to 28 February 2020, Johannesburg

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

From May 2020, all courses will be at revised 2020/21 rates; prices and dates to be announced before the end of 2019.

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Society of Tribologists and Lubrication Engineers

Examinations at SAIT

The South African Institute of Tribology will host three examinations of the Society for Tribologists & Lubrication Engineers (STLE) on **22 November 2019**. The venue is Science Park, Kelvin, and time is from 09:00 to 12:00.

PLEASE NOTE: Registration for 2019 is closed. The SAIT will host these exams again in 2020, dates to be determined.

Should you wish to write any of the STLE exams in the future, we advise that, as a vast knowledge of the subjects is required, you allow yourself at least a year to study the recommended materials (listed here). These exams are open to SAIT members in good standing.

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)**

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.

International Events:

December 1-4, 2019: IndiaTrib 2019, is the International Conference being organised by the Indian Institute of Science and Tribology Society of India. The conference will be held at the Indian Institute of Science, Bangalore. IndiaTrib 2019 is going to be a unique event with a galaxy of international Tribology experts who have already confirmed their participation as plenary and Keynote speakers. This could be a once-in-a-lifetime opportunity to hear from among the best Tribologists around the world. [IndiaTrib - 2019](#)

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.



September 5-10, 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:

Have you heard of PVI (Particle Volume Indexing)?

It all starts with 'Particle Counting', an important factor in analysing oil for abnormal wear characteristics and contaminants. But it's not just tracking particle counts that provide useful wear trends. It's a step ahead to consider the particle sizes as well as particle size distribution that different wear mechanisms can generate. In many instances, particle sizes start small and grow progressively larger as a wear problem increases in severity.

ISO 4406 particle counting is an excellent tool for determining oil cleanliness but particle count data itself also allows us to quantify particles into different size ranges. This quantification is often referred to as the particle size distribution. Particle size distribution is an important factor when trying to assess the development of an abnormal wear situation.

Enter **PVI**, a non-standard index number, originally developed by a major earthmoving OEM (Original Equipment Manufacturer). **PVI** estimates the total volume of all the particles in the oil sample based on the particle count data obtained in all eight channels of the particle counter from four to 100



microns. *PVI can be a useful tool for identifying and evaluating shifts in the particle count distribution that could indicate an abnormal wear situation developing. The value of PVI lies in its ability to express all eight channels of the particle counter as a single number which makes spotting changes in the particle size distribution easier.*

Steven Lara Lee Lumley with 2014 SAIT President, receiving the Best Technical Presentation Award for that year.

For more info and research please contact Steven Lara Lee Lumley at

stevenl@wearcheck.co.za.

Just when you thought you knew it all!

Using Drones for Remote Oil Sampling - The use of unmanned aerial vehicles (UAVs), also known as drones, has increased exponentially in recent years due to the advances in materials, aeronautics and operating software. These advancements have allowed drones to be employed in a variety of applications and to complete tasks that would be difficult, if not impossible, for people to accomplish.



Originally at

<https://www.machinerylubrication.com/Read/31239/drones-oil-sampling>

Some companies are now exploring the concept of coupling this technology with non-destructive analytical tools such as infrared thermography, vibration sensors and even oil sampling systems. Obviously, the ability to examine assets in locations that would be financially prohibitive or even physically impossible to obtain data from could prove quite valuable.

Read this interesting article and case study by [Michael D. Holloway](#), ALS Tribology

<https://www.machinerylubrication.com/Read/31239/drones-oil-sampling?>

PARTING SHOT

Did You Know?

Parting shot – Tribology has a strong partner in thermography. Friction generates heat, since infrared radiation is emitted by all objects with a temperature above absolute zero according to the black body radiation law. Thermography makes it possible to see one's environment with or without visible illumination. The amount of radiation emitted by an object increases with temperature; therefore, thermography allows one to see variations in temperature.



This thermogram shows excessive heating on a terminal in an industrial electrical fuse block. from <https://en.wikipedia.org/wiki/Thermography>

Thermography has a long history, although its use has increased dramatically with the commercial and industrial applications of the past fifty years. Firefighters use thermography to see through smoke to find persons, and to localize the base of a fire. Maintenance technicians use thermography to locate overheating joints and sections of power lines

which are a sign of impending failure. Building construction technicians can see thermal signatures that indicate heat leaks in faulty thermal insulation and can use the results to improve the efficiency of heating and air-conditioning units. Please visit: <https://en.wikipedia.org/wiki/Thermography> and https://en.wikipedia.org/wiki/Black_body



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.**