

# SAIT Technical Newsletter, November 2020

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## The SAIT Executive Committee:

Bringing the Committee closer to SAIT members and the wider Tribological community

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Introducing:  
**Sam Manamela,**  
SAIT Committee  
Member



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## Editorial

From November 2020, there will be two editions of the SAIT Newsletter each month: early in the month we will send you Technical information, and in the middle of each month, we will send you information regarding Training.

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## Tribology

**T**ribology plays a down-to-earth role in the world of friction that is well beyond the confines of high-tech laboratories. This is very evident from an insightful TRIBONET article '[Solving the Problem of Slippery Train Tracks Due to Fallen Leaves](#)'. This focused research in TRIBONET takes us back to basic principles:



*'Friction is the force experienced when two surfaces slide, or try to slide, across each other. We are thankful for friction when we put our foot on the brake to stop the car, or when we are walking down the sidewalk. However, friction is often seen as a negative. Friction causes wasted energy, the need for more force to get the work done and machines to lose their effectiveness. The loss of friction creates problems all around the world, such as those experienced by the rail system in the United Kingdom. Seasonal delays occur on a regular basis, causing interruptions and problems all along the line. Consequently, many individuals do not use the rail system, feeling it more hassle than it is worth.'*

'When the idea of replacing horses with steam engines running on metal rails came in, engineers were not sure if the wheels could grip the rails with enough friction to travel up the hills and down into the valleys. Experiments quickly revealed that if the train was heavy enough, a locomotive with smooth steel wheels could pull a large load. Since then, the friction coefficient between the trains' wheels and the rails has been a top concern for railway engineers. The friction coefficient determines how quickly the train can accelerate, the distance required for the train to come to a complete stop, and, most importantly, how many passengers and goods the trains can safely carry. For the full TRIBONET story please visit the following two sites.'

- ✓ <https://www.tribonet.org/solving-the-problem-of-slippery-train-tracks-due-to-fallen-leaves/>
- ✓ [The composition and friction-reducing properties of leaf layers \(https://doi.org/10.1098/rspa.2020.0057\)](https://doi.org/10.1098/rspa.2020.0057)

## Filtration – inescapably linked to tribology

Tribology & Lubrication Technology (TLT) magazine published a useful summary on '[The basics of filters and filtration](#)' under Lubrication Fundamentals December 2013 pages 22-23.

Tribology applications cannot afford to overlook the role of filtration. TLT points out that 'there are three major types of filters, each of which have their own unique properties. And more – 'Developing a good relationship with suppliers is helpful in making the right filter choice and how best to use them.'

According to TLT 'There are some terms often used: **nominal rating** (rates size of pores in filter, for example, 5-micron nominal), **absolute** (gives largest opening in media) and **beta ratio/efficiency** (how many times through the filter before all particles of a certain size are removed). Regarding beta ratio, the idea is to rate the efficiency of the filter. For example, if we pass a fluid (notice I said fluid, because the fluid could be air or hydraulic fluid) with 1,000 particles > 5 microns through a nominal 5-micron filter and we measure 500 particles > 5 microns in the output, then the beta ratio is  $1,000/500 = 2$ , which represents an efficiency of 50 percent. Or if we pass a fluid with 1,000 particles > 5 microns through a 5 nominal micron filter and 10 particles > 5 microns pass through the filter, then the rating is 100. This is written as:

$$\beta_5 = 1000/10 = 100 \text{ (Note: this represents an efficiency of 99 percent)'}$$

**Finally – 'The cost of filters is cheap next to the cost of replacing or shutting down a valuable piece of equipment and interrupting production'.**

Please read the full, insightful article at:

[http://digitaleditions.walsworthprintgroup.com/publication/?i=188615&article\\_id=1587709&view=articleBrowser&ver=html5](http://digitaleditions.walsworthprintgroup.com/publication/?i=188615&article_id=1587709&view=articleBrowser&ver=html5)

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## Training

*Follow the path from data to information and into knowledge.*

Please review <http://www.sait.org.za/events/training/>, and read our Training Newsletter in mid-November.

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## SAIT Events



### NOVEMBER TECHNICAL WEBINAR

**Tuesday 10 November 2020 at 16:00**

**“Challenges related to ‘macro’, ‘micro’ and ‘nano’”**

**by Professor Philip de Vaal**

**University of Pretoria**

Read more at <http://sait.org.za/events/tech-meetings/>

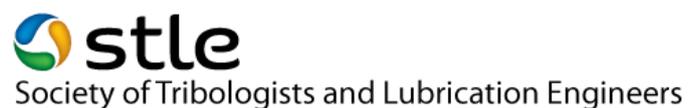
**If you wish to participate, please send your name, company, phone and email address by email to [secretary@sait.org.za](mailto:secretary@sait.org.za), and the login link will be sent to you.**

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

For full information about the **7<sup>th</sup> 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](#)

**Early-Bird Registration: Closing: 15 April 2021**

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## Contamination Corner



Dr. Robert M. Gresham, Contributing Editor | TLT Lubrication Fundamentals April 2015 says: ***“Eliminating contamination is impossible, but this three-step system will help you regulate it.”***

1. Establish an acceptable level via the ISO code is the first step in controlling contamination.
2. The second step is performing oil sampling and analysis to determine the level of contamination.
3. Finally, select filters and filter placement to remove contaminants.

But remember that vibration is also a contaminant



Gresham continues – “To accomplish this goal of contamination control, we need to instill a culture of change in the plant. Everyone needs to be focused on eliminating entry of contaminants into the system. This starts with incoming quality assurance requirements on the lubricant, moves to technique for adding the lubricants to the machines without introducing contaminants and ends with the control and elimination of contamination as the machine operates, which usually involves maintenance of sealing systems and filtration.”

For a more in-depth approach please visit:

[https://www.stle.org/files/TLTArchives/2015/04\\_April/Lubrication\\_Fundamentals.aspx](https://www.stle.org/files/TLTArchives/2015/04_April/Lubrication_Fundamentals.aspx)

## Rheology – Did You Know?



Rheology is a term that has strong affiliation with tribology. Rheology is a branch of physics, and it is the science that deals with the deformation and flow of materials, both solids and liquids. It applies to substances that have a complex microstructure, such as muds, sludges, suspensions, polymers and other glass formers (e.g., silicates), as well as many foods and additives, body fluids (e.g., blood) and other biological materials and other materials that belong to the class of soft matter such as food.

Terms such as **viscosity and friction** are very much part of the language of both tribology and rheology.

[https://en.wikipedia.org/wiki/Rheology#:~:text=Rheology%20\(%2Fri%CB%90%CB%88%C9%92,response%20to%20an%20applied%20force.](https://en.wikipedia.org/wiki/Rheology#:~:text=Rheology%20(%2Fri%CB%90%CB%88%C9%92,response%20to%20an%20applied%20force.)

## From the President’s Desk Patrick G. Swan

We have been in **COVID-19** lockdown for more than 7 months, and as we suffer from lockdown fatigue our economy suffers worse. To grow the economy again we need energy and to be globally competitive.

Eskom is infamously suffering from being plundered and mismanaged. We are told to expect further load shedding for up to another year, despite the relief that was granted to



Eskom by the COVID pandemic, which would have allowed an accelerated maintenance catch-up period.

Maintenance is a critical part of operating any plant. Without maintenance the plant will continue to operate in the short term, but as more failures occur the budget saved on withholding maintenance is insufficient to cover the mushrooming maintenance costs. **Mushrooming maintenance costs are trivial relative to the downtime costs and related loss of income.**

Tribology, and particularly lubrication engineering, are at the heart of maintenance. Although lubricant is about 4% of an average plant's maintenance budget, correct lubrication affects at least 80% of the plant's maintenance budget. No operation wants to follow the disastrous path of poor maintenance that occurred in Eskom. **Correctly applied, tribology and lubrication engineering will improve any operation's return on investment.**



## Parting Shot!

**It's time in Tribology to Avoid Knowing the Value of Nothing and the Price of Everything!**

Recent industry interactions have highlighted that fact that comprehensive industry standards for many industrial lubricants and fluids are notably lacking, or at least the compliance thereof. Such national standards would be of great benefit to end users in reducing the time and expense associated with evaluating potential products.

Reading the label or the datasheets only tells you part of the story, normally the marketing side - however, the quality that is in the drum is of importance from a total cost of ownership perspective. If the quality of the product is not up to standard, then the performance and life of the machine will be affected.

We all need to focus on the cost of lubrications (including failures due to lubrication) rather than the cost of the lubricant (ZAR / litre). By using a better quality / performance lubricant, often the machine performance will be improved with less downtime experienced. This quite often offsets the increased cost of the lubricant.

*A thought from John Fitton*

## We Want to Hear from YOU

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](mailto:admin@sait.org.za), for forwarding to The Editor. This will assist in disseminating information to all involved in Tribology.

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.**