The South African Institute of Tribology

understanding friction, lubrication and wear

Newsletter – May 2018

FRICTION could only be studied and understood at the atomic scale as recently as 1986 with the development of the Atomic Force Microscope. This versatile and powerful technology enabled scientists to take tribology to another level.
http://www.tribonet.org/tribology-history/

ETT – Essential Tribology Terminology

Simple definitions for three of tribology's essential terms

- ✓ **Drop(ping) Point -** The minimum temperature at which grease becomes sufficiently fluid to drip, as determined by a standard testing method. Thus, an indication of whether a grease will "melt" out of a bearing at operating temperature.
- ✓ **Emulsifier -** A substance used to promote or aid the emulsification of two liquids and to enhance the stability of the emulsion.
- ✓ **Extreme-Pressure Additive -** A substance that reduces wear and prevents seizure of sliding metal surfaces under extreme–pressure conditions.

SAIT TRAINING – Smoothing the path to knowledge

2018 SAIT TRAINING CALENDAR DATES:

- ✓ LE 115: 21 - 25 May 2018, Durban
- ✓ LE 116: 23 - 27 July 2018, Johannesburg
- ✓ LE 117: 27 - 31 August 2018, Cape Town
- ✓ LE 118: 8 - 12 October 2018, Johannesburg

SAIT ANNUAL GENERAL MEETING

Tuesday 15 May 2018 at 18h00

The Thirty-fourth Annual General Meeting of the South African Institute of Tribology will be held at Science Park, 1 Northway, Kelvin on Tuesday 15 May 2018 at 18:00. The 2017/2018 SAIT Annual Financial Statements and President's Report will be available at the AGM, where the 2018/2019 Executive Committee will be announced.

Thanks to the outgoing SAIT Executive Committee
For their sterling work in 2017/18

Dave Gamble
President

Patrick Swan
Vice President

Thomas Surmon
Member

John Fitton
Technical Programme

Gerard Perumal
Training and Materials

Doug Herschell
Promotion and Advertising

David Beard
Treasurer

Gill Fuller
Secretary

SAIT Technical Meetings

On Tuesday 15 May 2018,
After the AGM,
Dr Jean-Patrick Leger of Vesconite
will Give a Presentation on

"Adventures in Wear:
From Underground Gold Mines to Desert Railways to Ocean Floors"

SAIT ANNUAL AWARDS DINNER 2018

Tuesday 15 May 2018 at 19h00 for 19h30

The SAIT Annual Awards Dinner will be held at the Wanderers Club, Gala Room, on Friday 18th May 2018. We invite you all, Corporate, Private and Supplementary Members to support the SAIT by taking a table, or part of a table, for your colleagues, clients and guests, or attending in your private capacity with friends and colleagues in the tribology world.

Please let us know if you can attend as soon as possible by telephone – 011 804-3710, or by email to admin@sait.org.za or secretary@sait.org.za.

INTERNATIONAL EVENTS

September 4 - 7, 2018 - 45th Leeds-Lyon Symposium on Tribology: Smart Tribology Systems, at Leeds Trinity University, Leeds, UK
Please take the time to explore the symposium website Leeds-Lyon 2018
https://engineering.leeds.ac.uk/leeds-lyon-conference

17-20 September, 2018 – Malaysia: ASIATRIB 2018: the mega event in the series of International Tribology Conferences under the auspices of the Asian Tribology Council (ATC), the apex body of national tribology society of Asia Pacific countries. See the prospectus at: http://asiatrib2018.mytribos.org/PDF/ASIATRIB2018_prospectus.pdf

DID YOU KNOW? –'A tribological tip-trip'

Insulator or superconductor? Physicists find graphene is both.

SAIT newsletter #4 – Sept 2017 – commented that if the 20th century was the age of plastics, the 21st century seems set to become the age of graphene. It does not stop there!

Physicists at MIT and Harvard University have found that graphene, a lacy, honeycomb-like sheet of carbon atoms, can behave at two electrical extremes: as an insulator, in which electrons are completely blocked from flowing; and as a superconductor, in which electrical current can stream through without resistance. **When rotated at a "magic angle," graphene sheets can form an insulator or a superconductor.**

It's hard to believe that a single material can be described by as many superlatives as graphene can. Since its discovery in 2004, scientists have found that the lacy, honeycomb-like sheet of carbon atoms — essentially the most microscopic shaving of pencil lead you can imagine — is not just the thinnest material known in the world, but also incredibly light and flexible, hundreds of times stronger than steel, and more electrically conductive than copper.

For more on this fascinating subject please visit: http://www.tribonet.org/insulator-or-superconductor-graphene/

TRIBOLOGY & THE ENVIRONMENT

Getting maximum life from lubricating oil means avoiding entrained air bubbles – this lube-tip from Noria.com is practical and very relevant:

Lubricant foam has a low load carrying ability. Excessive foam build-up in a reservoir or sump will rapidly lead to excessive wear and catastrophic failure of the system. Too high a level of lubricant in an engine sump, by overfilling or mis-calibration of the level indicator (dipstick), causes the crankshaft and connecting rod big-end caps to whip up the lubricant into an all-pervading foam and rapid damage ensues. Air leaks into the oil flow or an open drop from a supply pipe into a hydraulic fluid reservoir can generate foam. Operationally, engines should not be overfilled, the level indicator correct, leaks stopped, and supply pipes extended to deliver return lubricant below normal liquid surface level in a reservoir.

PARTING SHOT

South Africa is heading for R15/litre – a SUV equipped with a 100litre fuel tank will cost R1500 to fill**!**

A summary, well-researched view from tyre manufacturer Bridgestone shows that **air-friction** is the major fuel consumer as speed increases:

Effect of speed on fuel efficiency factors		
Road speed	**88kph**	**120kph**
Tyre rolling resistance %	**33.30**	**24.00**
Air resistance %	**33.30**	**46.00**
Everything else %	**33.30**	**30.00**
	100.00	**100.00**

Anything that contributes to air-friction on a vehicle is magnified with increase in speed – excessive frontal areas, flapping tarpaulins, open load bodies with a raised tailgate and roof-racks are often overlooked.

And lowering cruise speed to 100kph instead of 120kph will also contribute to saving. ***The tribology of air-friction is all part of carbon footprint and climate***