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

SAIT NEWSLETTER, NOVEMBER 2017

International 'Contact Mechanics Challenge' completed.

TRIBOLOGY is the study of contacting bodies in relative motion – a fundamental issue is to understand the nature of the interfacial contact as a function of load for a particular combination of materials. While the contact problem for smooth objects is generally analytically soluble, and always straight-forward to tackle computationally, real engineered surfaces are almost never smooth. A solution to the problem of contacting rough surfaces was first addressed analytically just over 50 years ago by STLE member Jim Greenwood from Cambridge University…read further at:
http://www.tribonet.org/contact-mechanics-challenge-results/

ETT – Essential Tribology Terminology

Grasp three of tribology's essential terms

- ✓ **Base Oil -** A primary petroleum fraction or "cut" used, after further refining or special treatment, as a lubricating oil component into which additives are blended to enhance its properties. Other uses are as a process oil or extender in certain industries.

- ✓ **Bleeding -** The tendency of a liquid component to separate from a liquid-solid or liquid semi-solid mixture; as an oil from a grease.

- ✓ **Boundary Lubrication -** A state of lubrication existing when conditions of bearing, design, feed, load and method of application of the lubricants do not permit the formation of a separating lubricant film by hydrodynamic action.

SAIT TRAINING

Avoid the slippery slope of ignorance:

"LUBRICATION ENGINEERING"

Five-day course – 5 CPD Credits

Course Objectives: This course is designed to transfer a thorough understanding of

tribology from a lubrication engineering perspective. Over 20 topics take participants through basic chemistry to the theory of rubbing contact and friction in all industrial applications including the application of management principles, safety and the environment in tribology.

Register now for:

Lubrication Engineering 113

19 – 23 February 2018

For more information and to register for training please Ctrl + Click on this link:
http://www.sait.org.za/events/training

TRAVEL:

Dec 6 - 9: 9th International Conference on Industrial Tribology (ICIT 2017) at Kolkata (Calcutta), India.
Visit India in December 2017!

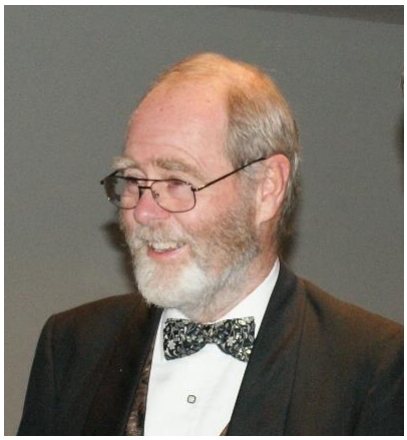
The Theme Session will focus on "**Tribology – A Key Enabler for Industrial Growth**". To enrich the content of this Conference, parallel technical sessions have also been planned covering 18 areas of tribology.

A very detailed and interesting brochure (ICIT-kolkata-brochure.pdf) can be downloaded from
http://tribologyindia.org/pdf/ICIT-2017-kolkata-brochure.pdf

Nov 15-16: 4th ICIS & ELGI Industrial Lubricants Conference – Vienna Austria
Nov 15-18: Tribology conference 2017 Autumn Takamatsu Kagawa Prefecture Japan
Jan, 9-11, 2018: 21st International Colloquium Tribology, Industrial and Automotive Lubrication Germany/Stuttgart, EU

6TH WORLD TRIBOLOGY CONGRESS

The Webinar on Tuesday 3 October, Report Back from the World Tribology Congress in Beijing, was very well-received. Members who participated expressed their interest and enthusiasm as follows:



- 'Thank you for the webinar. I´d like to see parts of it again...'
- 'Thank you very much for organizing the webinar. It was a great feedback and without being in Beijing, we had a summary.
- 'I am always impressed to realize that tribology can help in reducing up to 8% of a gross annual product of a country.
- 'We really have to increase people in the knowledge of tribology.
- 'Thanks once more for your commitment in this task'

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

Did you know that Earthquakes are governed by hardness of olivine, roughness and friction of faults? Olivine is the most abundant mineral in Earth's upper mantle, which comprises the bulk of the planet's tectonic plates. A new study gives researchers a better idea of olivine's strength, with implications for how tectonic plates form and move.

In a related paper by Thom, Goldsby and colleagues, published recently in the journal ***Geophysical Research Letters***, the researchers examined patterns of roughness in faults that have become exposed at the earth's surface due to uplift and erosion.

"Different faults have a similar roughness, and there's an idea published recently that says you might get those patterns because the strength of the materials on the fault surface increases with the decreasing scale of roughness," Thom said. "Those patterns and the frictional behavior they cause might be able to tell us something about how earthquakes nucleate and how they propagate." Extracted from Tribonet - http://www.tribonet.org/earthquakes-are-governed-by-hardness-of-olivine-roughness-and-friction-of-faults/

**We invite all SAIT Members to communicate -
their comments, concerns and constructive crititcisms
by contacting
Gill, Isabel or Berice at Telephone 011 804 3710
or email secretary@sait.org.za or admin@sait.org.za**

SIX FACTORS FOR SELECTING A HIGH-SPEED GREASE – Wes Cash director of Technical Services for Noria Corporation

Base Oil Viscosity – Ensure the viscosity adequately provides the lubricating film but is not too thick to cause excessive heat and drag.
Channelling Characteristics – The grease should be able to channel so excess heat isn't generated from grease churning.
Dropping Point – The dropping point of the grease should exceed the operating temperature by a wide margin to avoid excessive bleed and possible bearing failure.
Thickener Type – Choose a thickener that can provide the proper dropping point, channeling and bleed characteristics. Also, if you use multiple greases, check the thickener types for compatibility in case of accidental mixing.
NLGI Grade – The consistency of the grease will have an impact on the bleed characteristics and channelling properties of the finished lubricating grease.
Additive Load – Most applications require additives to help the oil lubricate. For greases, a wide variety of chemical and solid additives can be blended to aid in film strength and reduce friction and wear.
For further reading go to http://www.machinerylubrication.com/Read/30210/high-speed-grease?eid=219694677&bid=1898526

TUTORIAL VIDEO ON TRIBOELECTRIC NANOGENERATORS

BY PROF. ZHONG LIN WANG

This is a tutorial video introducing the history and development, fundamental principle, and practical applications of triboelectric nanogenerators. The lecture is given by Prof. Zhong Lin Wang, who is an expert in the field of nanogenerators and self-powered systems, https://www.youtube.com/watch?v=6919HKC88II&index=5&list=PLTuWsF3h2oXgDpK5DTDSrtuFin6ALExe6

PARTING-SHOT – DON'T IGNORE SMOKE!

Tribology in best practice is all about environmental care. Only one litre of combusted diesel fuel produces 2,64kg of CO_2 – but when this is mixed with smoke it's even worse. Modern diesel engines are designed to burn clean and the worst possible exhaust smoke is when it is tinged with blue.

Blue exhaust smoke indicates an engine is headed for serious mechanical failure due to a high oil ingress into a combustion chamber. This means an engine is burning too much oil due to worn intake valve guides or poor piston ring control – collapsed or worn rings.

A useful rough guide to measuring oil consumption is the ratio of oil consumption to fuel consumption, because the harder an engine works (fuel consumption) the more oil it will use. A good estimate is 0,6% of total fuel consumption.

White and black smoke are also problematic but urgent root-cause analysis is needed when an exhaust burns blue.