



Newsletter, April 2012

SAIT Provisional Programme 2012

3 May 2012: Technical meeting

Subject: '18th International Colloquium Tribology, TAE, Germany'

Time: 18:00 **Venue:** Science Park, 1 Northway, Kelvin, Sandton

4 May 2012: Annual Dinner at The Wanderers

The SAIT Annual Awards Dinner will be held on Friday 4 May 2012 at the Wanderers Club, Illovo. 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. Let us know as soon as possible.

Our Guest Speaker this year is James Dalton, former Springbok rugby player who made his debut in a 1994 match against Australia. He participated in the 1995 World Cup as a hooker, personifying strength for the team. This talented rugby player was capped 43 times for his country. James was involved with rugby from early school days and fully realized his dream of becoming a national and international rugby player. He owns a number of small, environmentally-aware business enterprises.

DATE	Friday 4 May 2012	TIME	19:00 for 19:30
SPEAKER	James Dalton		
VENUE	Wanderers Club, 21 North Street, off Rudd Rd off Corlett Dr, Illovo.		
COST	R300 per person		
DRESS	Formal or Smart		

The evening will include presentation of the SAIT Awards - The Louw Alberts Award, the Best Technical Achievement Award, the Best Technical Presentation Award and the SAIT Student Award. The Awards will feature in the SA Mechanical Engineer.

A cash bar will be available for your drinks and wine. Tables seat 8 or 10 people. Bookings will be on a 'first come - first served' basis. Please complete the form at [/za_members/23661/ftp/ad2012-flier-final.pdf](http://za_members/23661/ftp/ad2012-flier-final.pdf) and fax to 086 719-2261, or email Gill or Isabel at secretary@sait.org.za or admin@sait.org.za.

Lubrication Engineering Course (77): 21 – 25 May – Durban

29 May 2012 will be A Big Day for the SAIT:

Early afternoon, we will present a

Half-day Seminar on 'Energy Reduction through Material Selection'.

Presenters include:

Ary Coetzee, General Manager, Product Planning at Bridgestone, who will talk on tyres.

And **Dr Federico S Sciammarella from the CSIR** will give a presentation on 'Laser Materials Processing for Wear Prevention of Industrial Products.'

Light Refreshments will be served.

This will be followed at 18:00 by the SAIT AGM.

Then there will be an **Evening Technical Meeting** presented by **Dave Gamble** on 'Co-Operative Friction: a Tribological Aspect (A Lighthearted Look at Convincing Clients to Implement Tribological Principles.)'

11 - 15 June 2012: Lubrication Engineering Course (78): Science Park, Johannesburg

3 July 2012: One-Day Introduction to Lubrication Engineering: Breakwater Lodge, Cape Town

4 July 2012: One-day Introduction to Wear and Materials: Breakwater Lodge, Cape Town.

26 July 2012: One-Day Seminar on 'Metal Working Fluids and Their Place in Industry.'

13 - 17 August 2012: Lubrication Engineering Course (79): Breakwater Lodge, Cape Town

For further details of all SAIT functions, please contact Gill or Isabel at 011 802-5145/6 or e-mail either secretary@sait.org.za or admin@sait.org.za.

Members' Case Study Competition



During 2011, we challenged all members to send in their case studies for publication in the SAIT Newsletter. Entries should be no longer than one page.

The winning entry came from Shesby Chabaya of Tribology Services in Harare, Zimbabwe. Well done, Shesby and congratulations. Here is Shesby's Case Study:



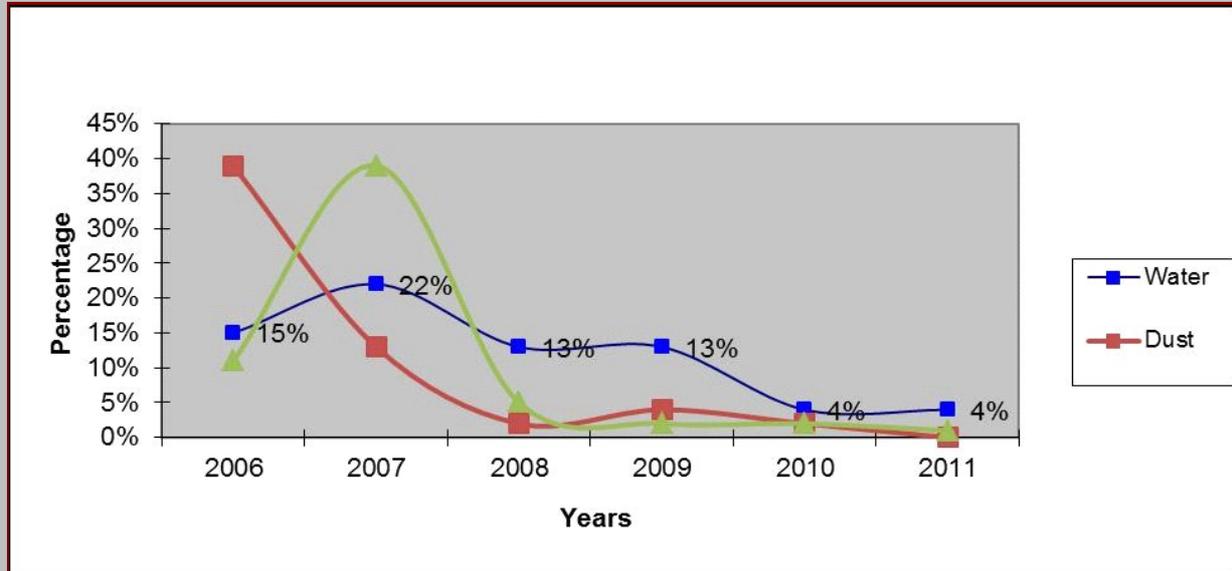
This case study is a testimony of ten years of successful implementation of an oil analysis program on mobile plant equipment, at a Sugar Estate in Southern Africa.

At inception of the oil analysis programme in year 2000, the fleet was plagued by a high rate of engine failures. About 90% of the failure analysis reports traced the problems back to oil contamination (mainly dust, fuel dilution and water contamination).

To counter the problems, oil analysis became a core part of the maintenance philosophy. Tribology Services, through specialized field services developed special understanding of the customer's operations as well as the problems affecting the fleet. Tribology Services proposed a number of improvements, which were implemented on the fleet. A five-year contamination control strategy was adopted, to control and eradicate contamination and maximise cost savings.

This resulted in a total transformation of the "Maintenance culture" at the Sugar Estate. Teamwork, commitment, enthusiasm and reaction time improved tremendously. The results are dramatic, as illustrated in the trends below;

A Decade of Continuous Improvement with the oil analysis program!



Dust contamination has reached a record 0,5%, fuel dilution 1% and water contamination 4% in 2011.

Savings

- These improvements resulted in a "Pull up" effect. Cost savings correspondingly increased over the years, with a record annual cost savings of over US\$700 000 realised in 2011 (conservative figure excluding savings through downtime minimisation).
- Though some gains can be quantified in financial terms, some gains are not easily quantified but have a positive impact on productivity and the overall workshop budget.

Here is what the workshop team had to say about the transformation realized through a decade of effective implementation of the oil analysis program:

"Through the oil analysis program, we have attained world class maintenance standard. We have realised improved equipment reliability and machine life." -- *Agricultural Services Manager*

"Our maintenance approach has transformed from reactive to pro-active." -- *Cane Haulage Superintendent*

"Tribology program is a basis for decision making and troubleshooting. Our decisions are now made from an informed position." -- *Heavy Plant Supervisor*

"The program enables us to pin-point probable sources of potential problems thus reducing time spent on problem diagnosis and solving. The 'problem source' is like the metaphorical 'needle in a haystack', and Tribology Analysis helps by magnifying the 'needle' so that it can easily and quickly be seen." -- *Maintenance Planning Engineer*

"The Tribology oil analysis program enhances better understanding of fleet problems, leading to continuous improvement. Through the oil analysis program we are inspired to save." -- *Cane Loaders*

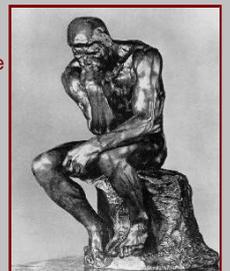
A sound oil analysis program has the power to transform the whole ethos of a workshop operation, and result in improved productivity and a great sense of pride in the workshops.

Your Tribology-Related Articles and Ideas are Needed.

Tribologists – we know you are a highly-intelligent, creative bunch of people! Please send

your articles for placing in our newsletter. They should be interesting, easy for the layman to understand and, of course, must be about one or other aspect of tribology. Articles should be between 500 and 1500 words and can be e-mailed to admin@sait.org.za.

If you don't have the time to write the article yourself, please e-mail your suggestions to admin@sait.org.za, and Isabel Bradley, our Assistant Secretary, with research and write the article on your behalf.



Extended Tribology in Action: What a Mouthful!

By Isabel Bradley, SAIT Assistant Secretary.

During research into matters of the mouth, I came across some beautiful tribological words: 'thegosis' and 'bruxism'.



On delving deeper, I discovered that 'thegosis' is the technique used by many mammals to sharpen teeth, which are then used as weapons. It derives from the Greek, *thego*, which means to whet or sharpen. The word is sometimes, incorrectly, used to describe tooth-grinding in humans. Hopefully in the 21st Century, no-one needs to use their teeth as weapons! In many cultures across Africa and the Pacific Ocean, thegosis is used as a means of beautifying individuals.

Bruxism, on the other hand, is the term for unconscious and damaging grinding of the teeth. Often done during sleep, it leads to massive wear, sometimes cracking or breaking of teeth, headaches, slight jaw dislocations and under- or over-bites.

Tribology is continually in action in our mouths. Friction and wear of the teeth are caused by bruxism or abrasion by food particles. In their turn, the teeth, through the friction of chewing, help break down our food ready for digestion. As in every field, healthy application of friction and wear is beneficial, while too much can create problems.



Saliva provides lubrication of the membranes in the mouth and smoothes the way for food to be digested by causing early break-down of the food. It has many other properties, including dissolving food particles between the teeth, thus cleansing the mouth and preventing infection. Without the lubrication of saliva, we would be extremely uncomfortable.

Toothbrushes of one sort and another have been used since before recorded history. They work on the principal of applying just enough friction to rub away material that could damage the teeth without actually wearing away the enamel. Throughout the ages, human beings have used various items for scrubbing dirt off their teeth, including feathers, bones, quills and sticks. Sticks are the fore-runners of the toothbrush: one end was pointed for picking debris from between the teeth, while the other was chewed until it frayed and became brush-like. The first bristle tooth-brush is reported to have originated in China, though according to various sources, this happened anywhere between 1600 BC at 1600 AD. These items found their way to England in the late 1600's, and William Addis is said to have produced the first 'mass-produced' toothbrush, using small animal bones for handles, drilling holes in one end, tying bristles into tufts which he then passed through the holes and glued into place. Bristles would have been from pigs, boars or horses. Toothbrush handles were made of different materials, including wood, ivory or even silver or gold. Today, most toothbrushes are made of various types of synthetic polymers, making the handle flexible enough to reach awkward corners in the mouth, also firm and flexible bristles.



Toothpaste consists of a chemical mix of abrasives, detergents, thickeners, moisturisers, water, flavouring and colouring agents, sweeteners and fluoride. Since prehistoric times, many substances have been used for cleaning teeth, among them soot, salt, baking soda, and chalk.

The idea of drawing dental floss between the teeth to scrape away debris was first put forward in New Orleans in 1815. Once again, this is a positive application of friction.



Correcting the faults caused by bruxism, bad brushing habits, accidents of nature and the after-effects of disease all call for the application of knowledge of materials: medical-grade polymers to create corrective devices and false teeth, the optimal materials to create implants. Reviewing materials used to fill cavities reveals several products: 'Amalgam' is a mix of mercury, tin, silver, zinc and copper, used mostly in the 20th Century. This created fillings that lasted for many years, but oxidised in the mouth and sometimes turned the teeth black. The 21st Century has brought us high tech materials such as composite resins, containing among other startling items, powdered glass, and ceramic beads. These are aesthetically pleasing, the finished product matching the colour of the tooth which it is filling.



The mouth is, indeed, an infinite source for studying every facet of Tribology in Action.

References:

http://www.tribology.group.shef.ac.uk/research/Human/research_projects_tooth_cleaning.html;

<http://en.wikipedia.org/wiki/Toothbrush>

<http://science.howstuffworks.com/chemistry-in-a-tube-of-toothpaste-info2.htm>

http://en.wikipedia.org/wiki/Dental_restorative_materials#Amalgam

International Tribological Events:

The Institution of Mechanical Engineers' **Tenth International Conference on Vibrations in Rotating Machinery (VIRM10)**, will take place from **11-13 September 2012** - for further information go to www.imeche.org/events/c1326

21st International Baltic Conference Baltmattrib 2012 will be held in **Estonia, Tallinn, from October 18 to 19, 2012**. Visit the official conference website www.ttu.ee/baltmattrib2012 for further information. We are looking forward to seeing you in Tallinn.

Lubricants Russia - 2012! Special Savings for Past Years Attendees - 800 Euro! Each year the most influential players and decision makers of the International lubricants industry meet at the **International "LUBRICANTS RUSSIA" Conference** in Moscow. We invite you to join them at this event from **13 - 16 November 2012**, now in its 8th year. To register please contact Elena Konstantinova, tel. +7 495 502-5433 or +7 495 778-9332 **e-mail: Konstantinova.Elena@rpi-inc.com** or visit our website, <http://www.rpi-conferences.com>.

Fuels - Conventional and Future Energy for Automobiles: 15 - 17 January 2013, in Stuttgart/Ostfildern, Germany. This is a Call for Papers. For further information, go to www.tae.de/fuels, phone +49 711-34008-35, fax +49 711 34008-65 or email martina.fischer@tae.de.

RENEX Eurasia 2012, the trade fair for renewable energy technologies, energy efficiency and insulation, will take place in Ankara, Turkey from 15 - 18 November 2012. Book your exhibition space today! Further information on RENEX Eurasia 2012 is available on www.hmsf.com/renex/eng/index.asp. For convenient travel packages or if you have any questions, please contact Ms. Lisa Kuntze on Tel: +27 (0)11 486 2775 or send an e-mail to lkuntze@germanchamber.co.za.