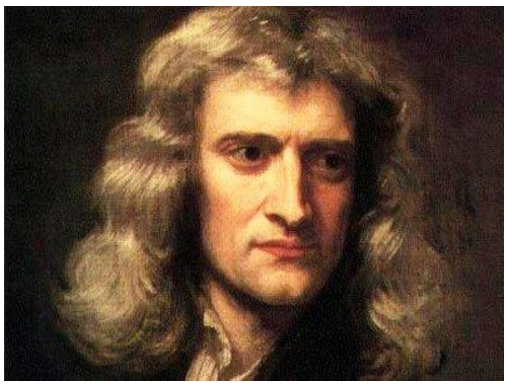
The South African Institute of Tribology
understanding friction, lubrication and wear

SAIT NEWSLETTER, January 2018

We wish all SAIT Members a Happy and Prosperous 2018!

1687 - Sir Isaac Newton & viscosity

TRIBOLOGY fell under the spotlight of Newtonian and non-Newtonian fluids in Sir Isaac Newton's Principia which laid down the foundations of viscosity. Newton described how 'normal' liquids or fluids behave, and he observed that they have a constant viscosity (flow). Non-Newtonian fluids change their viscosity or flow behaviour under stress. See http://www.tribonet.org/tribology-history/**; also visit** https://www.sciencelearn.org.nz/resources/1502-non-newtonian-fluids



ETT – Essential Tribology Terminology

Grasp three of tribology's essential terms

- ✓ **CCS** The Cold Crank Simulator is a test method that approximates the viscosity performance of engine oil during cold start-up.
- ✓ **Centistoke** The centistokes (cSt) is 1/100th of a Stoke (St), which was the fundamental unit of kinematic viscosity in the old CGS System, but is now considered to be a derived unit. In the currently used SI System the fundamental unit is millimetre squared per second (mm^2/s), which is equivalent to the centistoke.
- ✓ **Cleveland Open Cup (COC)** A test for determining the flash point and fire point of petroleum products, with the exception of fuel oil and products with flash below 79ºC (175ºF).

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SAIT Training – Avoid the slippery slope of ignorance

"LUBRICATION ENGINEERING"

LE 113: 19-23 February 2018, Johannesburg:

Book now, 1st-come, 1st-served, this course is filling up fast!

LE 114: 7 - 11 May 2018, Johannesburg

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

To book for any of these courses, find the form online at:

http://www.sait.org.za/events/training

2018 SAIT Webinars

Tuesday 23 January 2018 at 16:00 – David Beard, SAIT Executive Committee Member – **'Formula One Engine Development Over the Years'**. To register in advance for this webinar, click on this link: https://zoom.us/webinar/register/WN_QKb2aD6zSMalhIyDmJ2H-Q

Once you have registered, you will be sent an email with further details.

Tuesday 6 March 2018 at 16:00 – J-P Leger – Vesconite – Topic to be advised.

International Events:

September 17-20: 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. prospectus at http://asiatrib2018.mytribos.org/PDF/ASIATRIB2018_prospectus.pdf

Friday September 7, 2018: 45th Leeds-Lyon Symposium on Tribology:
Smart Tribology Systems Tuesday 4 – Leeds Trinity University, Leeds, UK

Please take the time to explore the symposium website Leeds-Lyon 2018

Call for abstracts - The 5th International Conference on Competitive Materials and Technology Processes, to be held in the **Hunguest Hotel Palota Lillafüred** at Miskolc-Lillafüred, in the mountain Bükk in **Hungary,** in **October 8-12, 2018**. For full information click on the link: http://www.ic-cmtp5.eu/

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Did You Know? – 'A tribological tip-trip'

Lubricants can also be classified by their main function:

- Anti-wear additives (AW): reduces wear by the growth of protective layer on the surfaces (zinc dialkyldithiophosphate).
- Extreme pressure additives (EP): protects the components from seizure by the formation of the coating on the surfaces (graphite, molybdenum disulphide)
- Friction modifiers: used to control friction, typically made of solid particles (graphite, molybdenum disulphide, tungsten disulphide, etc.).
- Corrosion inhibitors: protects the surfaces from the attack of chemically active substances, such as oxygen, by creating a corrosion resistant layer.
- Viscosity Index Improvers: used to prevent or minimize a decrease of the viscosity index of lubricants at higher temperatures.

http://www.tribonet.org/wiki/what-are-lubricants/

Tribology & The Environment –

One litre of oil pollutes one million litres of water

And ignorance of the law is no excuse.

Under the Waste Act No 59 of 2008, environmentally responsible collection and disposal of used lubes is the waste generator's responsibility. From 1 July, 2010, all hazardous waste generators creating over 20kg daily, must register on the South African Waste Information System (SAWIS) website (http://www.sawic.org.za/) & (http://sawic.environment.gov.za/)

Parting-Shot – Golfer's Story

Morphable surfaces could cut air resistance - A Tribonet snippet for all golfers:

'There is a story about how the modern golf ball, with its dimpled surface, came to be: In the mid-1800s, it is said, new golf balls were smooth, but became dimpled over time as impacts left permanent dents. Smooth new balls were typically used for tournament play, but in one match, a player ran short, had to use an old, dented one, and realized that he could drive this dimpled ball much further than a smooth one.

Whether that story is true or not, testing over the years has proved that *a golf ball's irregular surface really does dramatically increase the distance it travels, because it can cut the drag caused by air resistance in half.*

Now researchers at MIT are aiming to harness that same effect to reduce drag on a variety of surfaces — including domes that sometimes crumple in high winds, or perhaps even vehicles.

Detailed studies of aerodynamics have shown that while a ball with a dimpled surface has half the drag of a smooth one at lower speeds, at higher speeds that advantage reverses. So the ideal would be a surface whose smoothness can be altered, literally, on the fly — and that's what the MIT team has developed.

The new work is described in a paper in the journal Advanced Materials by MIT's Pedro Reis and former MIT postdocs Denis Terwagne (now at the Université Libre de Bruxelles in Belgium) and Miha Brojan (now at the University of Ljubljana in Slovenia)'. http://www.tribonet.org/morphable-surfaces-could-cut-air-resistance.