

Season's Greetings

2019 has been a very busy year here at WearCheck – not only were we bought out by our new holding company, Synerlytic, but we also acquired four new divisions when we purchased Anglo Field Services (AFS). We are extra proud of our reliability solutions team and Dennis Swanepoel, who won two awards at the Mobius CBM conference in Europe.

Our diagnosticians and technicians have travelled to many areas, both locally and internationally, to conduct training and to present papers at conferences and attend expos. You can read more about all this in this issue of Monitor.

Thank you sincerely to every member of WearCheck staff, for taking the changes in your stride and ensuring all the transitions have been smooth, and welcome on board to the new staff from AFS – we salute the expertise you have added to our new

Advanced Field Services division.

To all our customers, from all of us in the WearCheck family, we wish you a happy, relaxing break over the festive season.

FESTIVE SEASON OPEN HOURS

As always, we are dedicated to being available all year round, therefore we will remain open throughout the festive season to process samples. Staff in WearCheck laboratories in Johannesburg, Durban and Middleburg will be available to facilitate samples throughout the upcoming holiday period. On 24th December, we will close at lunch time.

Thank you for your ongoing support, and we look forward to connecting with you in 2020 for another busy, exciting year in the field of condition monitoring.



Neil Robinson, managing director



WAVES OF GOODWILL: The team at WearCheck Pinetown wishes everyone a happy summer holiday

Particle Volume Index (PVI) readings now on WearCheck reports

To effectively control wear and contaminants, it is vital to have a suite of oil analysis tests that will provide early warning of impending problems related to both wear debris and common contaminants.

When it comes to analysing particles in oil, it is important to consider the particle sizes as well as particle size distribution that different wear mechanisms can generate. In many instances, particle sizes start small and grow progressively larger as a wear problem increases in severity.

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Lab technician Mzambo Ngcobo operates one of the particle counters in WearCheck's Pinetown laboratory

LET'S GO TO GOA!

WearCheck truly values our membership of the International WearCheck Group (IWCG) – an international network of WearCheck companies from around the globe. Every year, IWCG members meet in a different member country to pool knowledge and experience of the latest condition monitoring trends, to share ideas and innovations, to talk about new laboratory techniques and instruments, and to keep the international dialogue going. This year, Goa on the West coast of India was the destination for the 2019 IWCG conference.

WearCheck MD Neil Robinson (back row, second from right), and Scott Sowman, financial manager (back right), joined delegates from Canada, India, USA, Hungary, UK and Argentina at the 2019 International WearCheck Group (IWCG) meeting in Goa, India in July



Team talk



WearCheck's sales staff are based all over the continent. They meet regularly to discuss condition monitoring's new and existing benefits to customers. Here they are pictured at a recent internal sales conference in Gauteng

MANAGEMENT MEET-UP

The management team that plans WearCheck's routes on the journey to excellence meets up regularly to assess the trip, discuss new roads and check the fuel, tyres, engine and other systems.



WearCheck's management review committee seen at a recent meeting. They are (back, from left) Michelle Padayachee, Steven Lumley, Neil Robinson (MD), Eddie Perumal, Scott Sowman, Gert Nel, Phillip Croucamp, Philip Schutte. Front (left to right) John Evans, Prinda Narasi and Meshach Govender

WHAT DOES WEARCHECK ACTUALLY DO?

We're proud to announce that our first ever corporate video has been launched. In it, many details about oil analysis and condition monitoring are explained. The camera takes a tour of some of our laboratory instruments in action, too. Have a quick watch – it is only seven minutes long. To view it, please email support@wearcheck.co.za and we will send you the link.

WearCheck MD Neil Robinson explains condition monitoring while being interviewed for the company's first corporate video



Particle Volume Index (PVI) readings now on WearCheck reports continued from page 1

Take, for example, a contact fatigue wear-related bearing problem. Particle-induced contact fatigue typically starts by generating platelets and spheres that are between five to ten microns in size, but as the fatigue problem progresses, micropitting of the bearing surfaces causes these platelets and spheres to turn to small chunks. These micropits - and the resultant wear debris in the oil - rapidly increase in size, as macropits on the bearings surface cause a simultaneous increase in larger particles that can be as big as 50 microns in size.

Now whilst ISO 4406:1999 particle counting is an excellent tool for determining oil

cleanliness, the particle count data itself also allows us to quantify particles into different size ranges. This quantification is often referred to as the particle size distribution. The particle size distribution is an important factor when trying to assess the development of an abnormal wear situation.

To this end, WearCheck has introduced the PVI (Particle Volume Index) as a measured value on all samples that receive a particle count. You will find the PVI value next to the particle count data on your oil sample report.

The PVI is a non-standard index number,

developed by one of the major earthmoving OEMs, that estimates the total volume of all the particles in the oil sample based on the particle count data obtained in all eight channels of the particle counter that measure from four to 100 microns. The PVI can be a useful tool for identifying and evaluating shifts in the particle count distribution that could indicate an abnormal wear situation developing.

Ultimately, the value of the PVI lies in its ability to express all eight channels of the particle counter as a single number which makes spotting changes in the particle size distribution easier.

TECHNICAL TIP: VISCOSITY INDEX

by Steven Lumley, WearCheck technical manager



Have you noticed something new on your WearCheck engine oil analysis reports? I'll give you a hint, it's underneath the "Viscosity" header on the second page of your two-page report or next to the viscosity readings on your one-page report. Great, you've found it – it's a column header called Viscosity Index (VI) with a whole bunch of numbers underneath it that you have never seen before.

As of September, this year WearCheck has introduced the VI as a standard on all samples that receive a viscosity at 40°C and 100 °C.

Now I'll bet you're asking yourself two questions: am I paying more for this and what the devil is a viscosity index? To answer your first question, no. This new addition to your engine oil analysis report is for free as part of yet another continual service improvement initiated by WearCheck. As for the second question, the devil really is in the details. So, let's run through some of those details. Firstly, we need to talk about viscosity index (VI) improvers.

WHAT IS A VISCOSITY INDEX (VI) IMPROVER?

Formulating modern lubricants requires careful selection and balancing of additive chemistry, viscosity index (VI) improver (also known as performance polymers) and base oils. A viscosity index improver is a lubricant additive, usually oil soluble polymers or copolymers, whose main function is to reduce the tendency of an oil's viscosity to change with temperature. They are used in

both mineral and synthetic base oil types. Without viscosity index improvers, it would not be possible to formulate today's modern multi-grade lubricants.

Simply put, VI improvers work by changing their molecular shape with temperature. The polymer molecules are small and coil-shaped when cold. In this state, they do not increase the oil's viscosity, as there is low friction on the metal-wetted surfaces in an engine and in the oil itself. With rising temperature, the molecules expand and unfold. Consequently, they increase the friction in the liquid and compensate for the decrease of viscosity that is caused by the higher temperatures.

VI improvers are used to formulate multi-grade engine oils, gear oils and automatic transmission fluids, power steering fluids, hydraulic fluids, as well as greases. It follows on then that the VI improver additive also contributes to the VI value of the oil.

WHAT IS THE VI OF AN OIL?

When it comes to oil selection, one of the most scrutinised values on a lubricant's spec sheet is the VI, as it speaks to the oil's properties and quality in terms of viscosity behaviour at different operating temperatures. The VI is a dimensionless number - in other words, it has no units and it is used to measure an oil's change of viscosity in relation to temperature.

Compared to water, which has nearly the same flow behaviour over a wide temperature range, oil changes its viscosity significantly with changing temperature. Additional influences such as oxidation, contamination

and pressure during operation also have an impact on these viscosity changes.

A low VI expresses a considerable change of viscosity with change of temperature. Such oils are highly viscous at low temperatures and rather thin at high temperatures. A high VI means the opposite: a small change of viscosity over a wide temperature range. When selecting lubricants for specific application e.g. an internal combustion engine, temperature-related viscosity changes must be taken into consideration as these properties can differ between oil types. A high VI is important for multi-grade oils where a restricted range of viscosity over a large temperature range is required to meet specification. Such a high VI enables optimum performance under varying temperature conditions.

At WearCheck, the VI is calculated from the two measurements of viscosity at 100°C and 40°C according to ASTM International's ASTM D2270 (Standard Practice for Calculating Viscosity Index from Kinematic Viscosity at 40 °C and 100 °C). Note - a true VI can only be calculated from an actual V40 and V100, not estimated V100 as is often done in some labs and instruments.

As is the case with the viscosity, the VI can change when the lubricant degrades (chemically "breaks down") or through accumulation of degradation by-products in the oil. The viscosity index is important not only for the selection of new oils but for in-service oils. The latter is used to check the degradation of the viscosity index improvers, which usually causes a decrease of the VI.



A viscometer operating in WearCheck's Pinetown laboratory

INTRODUCING ADDITIVES TO IMPROVE OIL QUALITY

Oil quality is established by the refining processes, and additives are most effective if the oil is well refined. Although the overall performance of an oil can be improved by introducing additives, a poor quality oil cannot be converted into a premium quality oil by introducing additives.

UPCOMING EXPOS

We look forward to seeing you at the **African Mining Indaba** from 3 – 6 February 2020. Please come and visit us at stand 1108 at the CTICC.

We are proud to be a title sponsor of the **Condition Based Monitoring (CBM) Conference**, which takes place 9 – 12 March 2020 at the Radisson Blu Gautrain Hotel in Johannesburg. This is the first time that this prestigious international event will take place on the African continent and will feature the latest reliability solutions techniques.

The CBM CONNECT Conference is powered by Mobius Institute, a worldwide provider of reliability improvement, condition monitoring and precision maintenance education to plant managers, reliability engineers and condition monitoring technicians.

We urge you not to miss the chance to attend this highly worthwhile event, which usually takes place in Europe or the USA. To sign up, please visit <https://thebcmconference.com/sa/>



Electra Mining Africa 2020 is at the Johannesburg Expo Centre from 7 – 11 September. WearCheck will be there.

WE ARE ALL EARS...

We extend our hearty thanks to everyone who took the time to participate in our annual customer survey. Your feedback is invaluable to us and has a sincere impact on our decisions around our future business services.

Kay Meyrick, WearCheck sales developer, is grateful for the positive feedback. Here are some compliments from our valued customers:

- *All that is needed is provided by WearCheck, also WearCheck is keeping clients up to date with the latest technology and service. Well done WearCheck you are saving our equipment from major failure.*
- *Your technical support teams are superb.*
- *The peace of mind from knowing that my units are being monitored professionally is great.*
- *I'm a happy customer!*
- *Business with WearCheck is professional.*
- *Excellent service and co-operation.*
- *This is a critical factor to our business and the support we received is brilliant.*
- *Keep up the good work.*
- *Think that WearCheck offers and produces excellent product and customer support.*
- *Keep it up WearCheck! Your time consciousness, values and professionalism are so excellent.*

And the winner is....! Brendan Foster (left) of Clover had his name drawn from the hat to win the lucky draw prize for customers who completed the 2019 WearCheck customer survey. Here, Brendan accepts his cash prize in Port Elizabeth from Leon Marshall, WearCheck's Eastern Cape representative



CERTIFICATION RENEWED

WEARCHECK IN WINDHOEK

WearCheck's Namibian laboratory, originally situated in Rosh Pinah, has now relocated to Windhoek. WearCheck Windhoek is situated at Unit 14, Lafrenz Industrial Park, Erf R/E 26 W, Rendsburger Street, Windhoek.

This lab will be open for business early in 2020.



During October, an annual external audit revealed no findings for WearCheck's ISO 14001 certification, which was renewed by the auditors.

ISO 14001 recognises the international standards of a company's environmental management systems, and that the company is meeting its environmental performance goals.

WearCheck quality administrator Prinda Narasi works tirelessly to ensure that the company's quality systems meet all the requirements



WearCheck India earns recertification

WearCheck India national manager Nissar Ahamed and his team are proud to announce that their laboratory has been re-awarded their certificate of accreditation for ISO 17025, after undergoing a rigorous external audit process.

ISO 17025 recognises that WearCheck India meets the general requirements for the competence of testing and calibration laboratories, in the field of testing.

National manager of WearCheck India, Nissar Ahamed (centre, standing), proudly displays the laboratory's ISO 17025 certificate of accreditation. With him are staffers (from left to right) Thasgatir, Jameel, Mohamed, Mujibunissa, Mohammed, Reshma and Faith (standing). Seated are Sai Ganesh and Sajidha

FREE TECHNICAL BULLETINS

Did you know? WearCheck scientists and technicians regularly publish articles on topics that are within their area of specialisation. We publish the information in our popular Technical Bulletin series. You can download the articles for free at any time from our website (<http://www.wearcheck.co.za/info/publications/technical-bulletin>). There are 68 articles already loaded onto our website – have a browse, there may be one that interests you.

To receive an emailed copy of future Technical Bulletins, please scan this QR code with any smart device to add yourself to the mailing list.



Technical Bulletin topics?

Is there a particular subject you would like to see featured in a Technical Bulletin? Simply email your suggestion to prinda@wearcheck.co.za.

OUT AND ABOUT

The WearCheck flag has flown high in many areas of late, as our staff travel to attend conferences, expos and conduct condition monitoring and oil analysis training courses – Eastern Cape, North West Province, Gauteng, KZN and even to Namibia and North America.

KEEPING THE WHEELS TURNING IN GAUTENG

Quentin Gustav von Kleist provides technical support to WearCheck customers in the Greater Gauteng area. He likes to ensure his customers are getting the best return on their investment in the WearCheck condition monitoring programme, particularly with the basics such as taking oil samples correctly and understanding the benefits of a good oil analysis programme. Gustav conducts oil analysis training courses on-site for customers. He is pictured here with some of the Botselo Carriers team, who signed up for a WearCheck training course in Delareyville.



Quentin is pictured here with some of the Botselo Carriers team, who signed up for a WearCheck training course in Delareyville

Wind turbine training



Diagnostician Ashley Mayer conducted oil analysis training for four wind farms which are operated near Port Elizabeth

Bus fleet maintenance training



WearCheck technical support consultant Quentin Gustav von Kleist (back right) is seen with some of the Ipelegeng bus fleet maintenance crew who underwent toolbox training recently

Oil analysis training



WearCheck training consultant Jan Backer conducted oil analysis training in Cape Town for De Beers Marine and in Namibia recently

CONDITION BASED MAINTENANCE (CBM) CONFERENCE USA

Dennis Swanepoel – WearCheck's reliability solutions lead technician, Mobius trainer and CAT IV graduate – and RS technician Roeloff Hoffman attended the CBM (Condition Based Monitoring) conference in Indianapolis, USA in September, where they both presented papers on different aspects of condition monitoring.



Dennis Swanepoel, WearCheck's reliability solutions lead technician, Mobius trainer and CAT IV graduate (standing), explains a query about vibration monitoring to delegates at the CBM conference in the USA recently



Roeloff Hoffman, WearCheck RS technician, presented a paper at the recent CBM conference in Indianapolis



Anupa Mabeer has worked at WearCheck for 25 years

ANUPA MABEER

Anupa Mabeer, laboratory data manager for WearCheck's transformer chemistry services division, has been with the company for 25 years.

When Anupa joined what was then Transformer Chemistry Services (TCS) back in 1994, she was the very first employee taken on by founder Ian Gray, when the company began in his garage in Westville.

Armed with a diploma in analytical chemistry, Anupa's first role was working as laboratory technician with the fledgling company. Fast forward 25 years, and she has moved out of the laboratory to data capture and now manages all the data that comes out of WearCheck's three transformer laboratories which are based in Johannesburg, Durban and Cape Town.



Daan Burger has worked at WearCheck for 25 years

DAAN BURGER

Daan joined the WearCheck family 25 years ago in the role of diagnostician, in the company's Pinetown branch.

With a NHCT T4 and a diploma in datametrics under his belt, Daan has always had an interest in all things technical, and his particular passion has long been the aviation industry.

Says Daan, 'I may have been a diagnostician for 25 years, however, the industries we serve and the technology which is used in condition monitoring is constantly evolving, therefore my job has constantly changed to keep abreast of technological advancements.

'It has been very satisfying to be able to help customers by detecting impending machine failure and prevent disaster.'



Aaron Mchunu has worked for WearCheck for 20 years

AARON MCHUNU

Recycling assistant Aaron Mchunu has worked for WearCheck for 20 years. After initial stints in stores and the sample room, today he is responsible for ensuring that the company's many earth-friendly initiatives are running smoothly. WearCheck redirects waste from landfill sites for recycling. Every piece of paper, plastic and cardboard used or processed by the company is collected and given to an approved/registered third party for recycling. Plastic oil sample bottles, caps and cores are melted down into pellets, which are used to manufacture industrial products such as plastic buckets.

The oil from oil samples is not simply discarded but is also recycled. After the oil and water are separated, the oil is processed and then re-used in other applications. The oily tissue is converted to refuse-derived fuel and is used, for example, as a fuel for cement kilns.



Josephine Rakolota has worked at WearCheck for 20 years

JOSEPHINE RAKOLOTA

Steelpoort customer support specialist Josephine Rakolota has worked for WearCheck for 20 years. Josephine began her career as receptionist in the company's Johannesburg office, after which she was promoted to customer support. A stint in Isando was followed by a move to her current base at Steelpoort, Limpopo, where she has been since 2015. She was promoted to sales and customer support in 2016. Josephine has completed several courses, including an introduction to business management through Damelin and a SHE (safety, health, environment) rep function course with NOSA.



Chamaine Pillai has worked at WearCheck for 20 years

CHAMAINE PILLAI

Bookkeeper Chamaine Pillai began her journey at WearCheck in the laboratory, where she worked as a lab assistant. After a few years, she moved across to the accounts team and worked her way up from accounts clerk to junior bookkeeper and then, after completing a diploma in financial management, she was promoted to bookkeeper.

One of the highlights of Chamaine's career with the company was participating in the 2012/13 mentorship programme, which, she says, "really took me out of my comfort zone!" Chamaine and her mentor - diagnostic manager John Evans - won the partnership award for this project.

WEARCHECK MOBIUS TRAINING COURSES

Mobius training is recognised the world over as the standard for reliability solutions technicians. Mobius courses are presented by WearCheck on-site or at the ABB School of Maintenance in Johannesburg, RSA. To book your Mobius course, please email christenef@wearcheck.co.za or saskiac@wearcheck.co.za or contact Wearcheck on 27 (0) 11 392 6322.

Mobius Training

Course	CPD Points	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Vibration Analysis - CAT 1	3		3-6					27-30					
Vibration Analysis - CAT 2	4			2-6					17-21				
Vibration Analysis - CAT 3	4				20-24						5-9		
Precision Maintenance - Balancing	2			16-17								2-3	
Asset Reliability Practitioner - ARP 1	2		10-13					20-23					
Asset Reliability Practitioner - ARP 2						27-1			30-4				
Asset Reliability Practitioner - ARP 3					30-3							16-20	

WEARCHECK 2020 TRAINING COURSES

ON-SITE AND CUSTOMISED TRAINING

WearCheck offers a range of courses with customised training content to suit your requirements, dates and location, for a minimum of seven delegates. Training includes sampling of lubricating and transformer oils, lubricant storage and handling, introduction to oils and concise oil analysis for workshop technicians.

To book a course, or for full details of all Wearcheck courses on offer, please email training@wearcheck.co.za.

Oil Analysis Training (3 day workshop)

Course	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Oil analysis 1 (2 day workshop) Oil analysis 2 (1 day workshop) - Gauteng		11-13										
Oil analysis 1 (2 day workshop) Oil analysis 2 (1 day workshop) - Middelburg			10-12									
Oil analysis 1 (2 day workshop) Oil analysis 2 (1 day workshop) - Cape Town					12-14							
Oil analysis 1 (2 day workshop) Oil analysis 2 (1 day workshop) - Rustenburg						9-11						
Oil analysis 1 (2 day workshop) Oil analysis 2 (1 day workshop) - Bloemfontein							14-16					
Oil analysis 1 (2 day workshop) Oil analysis 2 (1 day workshop) - KwaZulu-Natal								11-13				
Oil analysis 1 (2 day workshop) Oil analysis 2 (1 day workshop) - Namibia									8-10			
Oil analysis 1 (2 day workshop) Oil analysis 2 (1 day workshop) - Gauteng										13-15		
Oil analysis 1 (2 day workshop) Oil analysis 2 (1 day workshop) - Northern Cape											10-12	

HIGHLIGHT YOUR SUCCESS

If oil analysis has helped prevent a major failure or saved your company money, we would like to feature this in Monitor. Our writer will contact you for the details and will write the article for your approval. Simply email prinda@wearcheck.co.za and we will contact you.

Planet-friendly option

Please help us to be more earth-friendly on our quest to reduce paper usage – if you would prefer to receive an electronic copy of this publication, please scan the QR code with any smart device and it will email us your request. The QR code can be scanned with any free QR reader app.



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