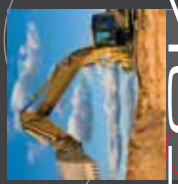
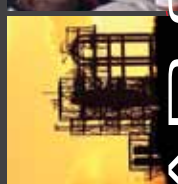
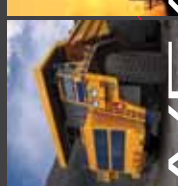
WEARCHECK 40th anniversary
Est 1976
Condition Monitoring Specialists
A Part of Torre Industries

MONITOR
ISSUE 72

WEARCHECK
CONDITION MONITORING
THROUGH OIL ANALYSIS







WEARCHECK DELIVERS HUSAB LAB

Namibia's Husab Uranium Project – a mining operation that is owned by Swakop Uranium – awarded WearCheck a 5-year contract to supply and operate an on-site laboratory, which opened recently.

The on-site laboratory boasts a full complement of instruments, and provides Husab with services such as oil analysis and a wide spectrum of reliability solutions services.

As an open-pit mining operation, Husab uses the conventional truck and shovel mining method. The on-site laboratory is well-placed to maintain the plant used in this process – including a huge scale of loading and hauling equipment – at optimum output capacity.

The laboratory was set up as part of a joint venture with sister company, Set Point Laboratories, who built and supplied the assay side of the laboratory.

Husab Mine is situated 45 km from Walvis Bay, and when it reaches full production capacity of around 7 000 t of uranium, it will be the second largest uranium mine globally.

WearCheck managing director Neil Robinson attended the official opening of the Husab oil analysis laboratory in Namibia. Here, he outlines how the on-site laboratory will boost plant performance

The brand new Husab laboratory at Swakop Uranium is kitted out with the full complement of laboratory instruments

LUBE TIP

Water absorption in fluids
The amount of water that a given fluid will absorb depends upon its base stock, viscosity, additive package, and temperature. The amount of water that can dissolve in a fluid is termed its saturation level. The saturation level for a hydraulic fluid is 200-300 ppm while for a lubricating oil it is around 500-600 ppm. Oil is cloudy when it is above its saturation level. The saturation level for a synthetic fluid is generally much higher than for a mineral base fluid.

Extract from the Noria Corporation's "Lube Tips Newsletter".

TRANSLATED TECHNICAL BULLETINS

Bonjour! Bom dia!
Did you know that some of our most popular Technical Bulletin titles are now available online in French and in Portuguese?

These, and several other important WearCheck documents are on the WearCheck website, and can be downloaded as pdf files, for FREE!

Newly-translated Technical Bulletin titles are uploaded regularly, so make sure you keep checking to get them all.

Please click on the icon of the French or Portuguese flags on the bottom left of our website to access the documents, or visit www.wearcheck.co.za/french or www.wearcheck.co.za/portuguese

WearCheck technical manager Steven Lumley shows off some of the translated Technical Bulletins

OUT AND ABOUT

Oil analysis and condition monitoring are highly specialised fields, and it has been proven time and again that companies gain by far the biggest return on their investment in a condition monitoring programme when their maintenance staff (at all levels) undergo the relevant training.

WearCheck staff conduct customer training wherever there is a need, in addition to the scheduled training courses. They also attend seminars, present papers and are present at expos to keep their fingers on the condition monitoring pulse and stay abreast of the latest developments.

Some recent trips have included Botswana, Zimbabwe, Dubai, India and Mining Indaba in South Africa.

Building Botswana

Delegates from a South African earth moving company operating on one of the diamond mines in Botswana, attended a training course run by diagnostician Quinton Verster

While conducting training in Botswana, diagnostician Quinton Verster paid an on-site visit to inspect mining machinery

India Technology

WearCheck India attended the EXCON in Bangalore, recently. This expo is touted as South Asia's Largest. Construction Equipment & Technology Trade Fair. Pictured here is Nissar Ahamed, national manager of WearCheck India.

Desert Development

A group of National Drilling Company delegates attended a WearCheck training course in Abu Dhabi recently. Ashley Mayer, training manager for WearCheck, is third from left in the back row (blue shirt), and Vinod Athavia from WearCheck PM (Dubai) is on the right in the back row (white shirt). Mayer travelled about 150km out from the city into the desert to run the training course

Accra Acolytes

Ghana in West Africa is another foreign location where Ashley Mayer conducted WearCheck training courses for customers in the region

Daan Burger, diagnostician

Just plane talking

WearCheck diagnostician Daan Burger recently did a presentation to the Johannesburg chapter of the EAA (Experimental Aircraft Association) – a group of aviation enthusiasts who promote and support recreational flying, as well as the building and restoring of non-type certificated aircraft.

The event organiser had this to say to members, 'I have enrolled Daan Burger from WearCheck, which is a company specialising in condition monitoring. Daan will cover the important topic of 'the right oil for your engine.' This topic is probably as important as having fuel in your tanks!'

The talk was very well-attended!

UPCOMING EXPOS

Watch out for WearCheck at the MENA mining expo in Dubai in October 2016, where players in the EMEA arena of mining, quarrying and construction materials industries congregate.

And, for the first time, the WearCheck team will attend the MINEX mining expo in Iran in October. WearCheck will also be present at Windaba 2016 in November.

WearCheck managing director, Neil Robinson

Transformer oil analysis – key to a cost-efficient maintenance programme

By Neil Robinson, managing director of WearCheck

Regular oil analysis is acknowledged as being extremely useful in monitoring the condition of engines, drivetrains, hydraulics, turbines and many other types of oil-lubricated equipment. The same can be said for transformer oils, which are used to insulate many transformers and other electrical distribution equipment. The analysis of transformer oils not only provides information about the oil, but also enables the detection of other potential problems, including contact arcing, ageing insulating paper and other latent faults, and is an indispensable part of a cost-efficient electrical maintenance program.

Transformer maintenance has evolved over the past 20 years from a necessary item of expenditure to a strategic tool in the management of electrical transmission and distribution networks. Extreme reliability is demanded of electric power distribution, and even though the failure risk of a transformer and other oil-filled electrical equipment is small, when failures do occur, they inevitably lead to high repair costs, long downtime and very real safety risks. Moreover, transformers are too expensive to replace regularly and must be properly maintained to maximise their life expectancy.

By accurately monitoring the condition of the oil, many types of faults can be discovered before they become serious failures and outages can potentially be avoided. Furthermore, an efficient approach to maintenance can be adopted and the optimum intervals determined for replacement. Some of the checks are relatively simple: the operation of the gas relays, the operation of the on-load tap-changer, checks on oil leaks, etc. However, breakdown of one of the most crucial elements, the oil / paper insulating system, can only reliably be detected by routine oil analysis. By measuring certain physical and chemical properties of oil, in addition to the concentrations of certain dissolved gases, a number of problem conditions associated with either the oil or the transformer can be determined.

Some common tests performed on electrical transformer oils include moisture content analysis, Acid Number, Dielectric Strength, Power or Dissipation Factor, Interfacial Tension (IFT), Furanics or (degree of polymerisation), Dissolved Gas Analysis (DGA) and PCB analysis.

Methods of PCB Analysis

Current methods of analysis are divided into two major groups: PCB Specific and PCB Non-specific. Non-specific methods test for PCBs indirectly by detecting one of the components of the PCB compound, usually chlorine. In general, non-specific methods are quicker and less expensive than the specific methods; however, these tests are susceptible to false positive results, since the test does not detect PCB itself.

Specific methods utilise some type of chromatography to separate PCB molecules from each other and interfering compounds. It is not a case of simply finding an easily quantifiable compound, but of quantifying a complex mixture of compounds. Of the three major chromatography types, gas chromatography (GC), thin layer chromatography (TLC) and liquid chromatography, GC is the preferred and most extensively-used method.

The PCB associated terminology is defined below.

Non PCB
Any fluid, including that in electrical equipment, and any item which has a measurable PCB concentration of up to 50ppm of PCB, is considered a non-PCB item.

PCB contaminated
Any fluid, including that in electrical equipment, and any item which has a measurable PCB concentration of 51ppm or greater but less than 500ppm is regarded as being PCB contaminated.

PCB item
Any fluid, including that in electrical equipment and in any item, which has a measurable PCB concentration equal to or greater than 500ppm, is regarded as a PCB item.

Note: transformer oil that has not been tested must be classified as PCB contaminated until shown to be otherwise.

Once the PCB status is determined, a sticker is issued and fixed to the item in question. This allows for quick reference and ensures that potential cross-contamination is avoided during future sampling, maintenance and decommissioning if necessary.

Blending PCB contaminated oil with virgin or other oil to meet the legal requirements is obviously an illegal practice that has been shown to happen from time to time. This practice simply has the effect of contaminating virgin oil supplies and ensures that the PCBs persist in the environment and leads to further contamination.

For greater detail on PCBs, their management, disposal and applicable legislative issues surrounding them, please visit www.wearcheck.co.za, and see the article entitled "Guide for PCB management of insulating oils in South Africa" by I.A.R Gray under the additional info section.

Proper transformer sampling

Just like machinery oil analysis, the ability of transformer oil analysis to provide an early warning sign of a problem condition is dependent on the quality of the oil sample that is sent to the lab. A sampling point on any equipment should be identified and clearly labelled for the technician. As with sampling locations in other types of equipment, the same location should be used each time a sample is collected to ensure representative conditions are tested. This point should be located in a place where a live oil sample can be collected rather than in an area where the oil is static.

Just like machinery oil analysis, electrical transformer oil analysis can play a vital role in preventing unscheduled outages in electrical transmission and distribution equipment by determining the condition of the equipment itself, and other vital components, including the condition of the oil and the cellulose paper insulation. For all critical oil-filled electrical equipment, including transformers, circuit breakers and voltage regulators, regular, routine oil analysis should be the cornerstone of any PM program.

For more information and an in-depth discussion of each of the tests, please visit http://www.wearcheck.co.za/useful-info/technical-bulletin and view Technical Bulletin 54: Liquid Chromatography and its application in transformer oil analysis.

WEARCHECK TURNS 40

2016 – this is the year that we celebrate WearCheck's 40th birthday. The company has enjoyed ongoing celebrations all year round to mark this auspicious milestone.

A special company logo was developed just for 2016, featuring the emblem of a ruby, a stone which traditionally represents 40 years.

A branded 40 year cake was baked for each region, where all staff members were given a piece, as well as a unique commemorative mug.

The company is currently compiling a beautiful memory book, featuring photographs and memories over the last 40 years in the oil condition monitoring business.

WEAR® CHECK 40th anniversary
Est 1976
Condition Monitoring Specialists
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40 years of condition monitoring excellence

WearCheck has enjoyed four decades as leader of the condition monitoring industry in Africa. Here are some memorable moments from our earlier days...

1981

WearCheck produces the first fully computerised reports

1988

WearCheck is named the largest oil analysis laboratory in South Africa

1989

WearCheck is the first in SA to introduce the PQ (Particle Quantifier) test

TWO MILLION SAMPLES FOR MICHELLE

Congratulations to WearCheck diagnostician Michelle Allis, who recently diagnosed her two millionth oil analysis sample! Michelle began her career with WearCheck in Durban in 1997 as a diagnostician. She spent many years training with diagnostic manager John Evans and his team until 2010, when she emigrated to the UK, from where she has continued to work for WearCheck. Michelle operates a remote diagnostic service for WearCheck South Africa via an online diagnostic facility. Sample results from all of WearCheck's laboratories are uploaded onto an intranet, Michelle accesses the data online, performs the diagnoses, and in turn uploads this information back onto the WearCheck system

Michelle has clocked up a record 2 000 000 samples in just under 20 years that she has been diagnosing for WearCheck.

We are super proud of you, Michelle! Exact international statistics are not officially monitored, however, we believe that your achievement aligns you with the top few diagnosticians in the world, with this incredible number of diagnoses to your credit.

WearCheck diagnostician Michelle Allis recently diagnosed her two millionth oil analysis sample, placing her alongside the top few diagnosticians in the world who have performed an equivalent number of sample diagnoses – among them, fellow WearCheck Diagnostician Rowan Maartens

Twenty years at WearCheck

At WearCheck, we pride ourselves on having outstanding staff members who have many skills in many fields, however, one of the most respected attributes is dedication. The levels of staff loyalty are among the qualities that place WearCheck above and beyond our competitors.

MD Neil Robinson praised the commitment of the team members, many of whom have supported the company for several decades. 'We salute those WearCheck staff members who have recently attained important milestones in their length of service to the company – thank you and well done.'

This year, these people are celebrating 20 years at WearCheck: Michelle Padayachee – HR manager, Leon Madurai in IT, Felile Hlabisa and Viloshni Bishwalall in data processing, and Deon Yettian in stores.

HR manager Michelle Padayachee has worked at WearCheck for 20 years

Software support consultant Leon Madurai has worked at WearCheck for 20 years

DP admin clerk Felile Hlabisa has worked at WearCheck for 20 years

DP admin clerk Viloshni Bishwalall has worked at WearCheck for 20 years

Stock controller Deon Yettian has worked at WearCheck for 20 years

Steelpoort is strong

WearCheck Steelpoort continues to offer outstanding customer service – providing a 24-hour sample turnaround time and skilled on-site sample taking – where WearCheck technicians even go underground into mine shafts in special fire-proof vehicles to take samples from sub-terrain equipment.

Some of the Steelpoort team members are (from left) Lopi Molangoane, Captain Makofane, James Tshabalala, Passwell Mashoeu, Michael Masemola and Rolet Mashego. Seated: Permission Malele
Inset: Robert Mokgama

TECHNICAL TIP
Comparing the cleaning ability of Group III and IV oils

QUESTION:
"How does a Group III engine oil compare to a Group IV in its cleaning ability? I have read and understood the potential problems of switching a higher mileage engine from a conventional oil to a synthetic PAO but is there less inherent risk with switching to a Group III? From my understanding esters act more like a solvent (more aggressive I assume) and detergents, and dispersants more or less attach themselves to sludge and other contaminants and carry it away in that form."

ANSWER:
Most engine oils are now formulated with Group II (hydrotreated) or a mixture of Group I (conventional mineral oil) and Group II base oils to meet the latest API gasoline (SM) and diesel (CJ-4) performance designations.

Because Group III and Group IV (PAO) base oils are both considered synthetics (since 1999), any oil labeled as a full synthetic, would contain either Group III or PAO, or both. Any oil labeled as a partial synthetic or semi synthetic or synthetic blend would contain Group I or Group II (mineral oil) plus some amount of Group III or PAO (synthetic).

There are no designations for us, as end-users, to know what specific base oils the oil formulator has used, so your question is a bit academic in nature. We would never know if we were purchasing a Group III engine oil vs. a Group IV (PAO) engine oil.

But, from an academic point of view, I would expect the cleaning ability of a Group III and a PAO to be similar (generally poor). Again, academically, I would expect less risk of seal issues etc. when switching from a Group III (as opposed to a Group I) to a PAO, as the Group III and PAO are chemically similar.

Ester synthetics have a higher degree of solvency than Group II, III or PAO base oils. This means they will dissolve additives and deposits more readily and may cause some seals to swell slightly (they also can remove some paints). These characteristics (not the paint removal) can be beneficial and some oil formulators will add some small amounts of ester base oils into their synthetic (Group III and PAO) formulations to improve these characteristics.

- Courtesy of Noria Corporation

MAKING HEADWAY

Our man in the Middle East

Peter Safadi recently joined the WearCheck family as the regional manager: Middle East, based at WearCheck PM in Dubai. Peter has spent over 40 years running businesses in the Middle East, including Jeddah, Riyadh, Oman, Bahrain, Egypt, Spain, Morocco and even Iraq. His main focus to date has been on electronics and hydraulics and managing a steel factory. He recently travelled to South Africa to meet the team at WearCheck head office

Our foreign figure watcher

Brandon Bisunath is in the hotseat as one of WearCheck's two foreign operations book-keepers, where he handles the accounts for the company's cross-border operations in Zambia, Mozambique and Ghana. Armed with a B.Comm degree from UKZN, and work experience in a shipping company (accounts and finance) and an oil company (logistics), Brandon keeps track of WearCheck's foreign currency accounting

Our lady in sales

Juliané de Beer has already been part of the WearCheck team for two years, and recently moved across into the sales development arena from customer support. Juliané, who holds a certificate in Business Management, travels many kilometres every day to visit existing customers as well as potential new ones

Our Steelpoort team

Thomas Madlala has been promoted to business development and technical support at WearCheck Steelpoort

Josephine Rakolota has been appointed as sales and customer support at WearCheck Steelpoort. She has an in depth knowledge of WearCheck's customers, having provided customer support for 17 years for the company

Our Witbank worker

Dennis Swanepoel has been promoted to branch co-ordinator for WearCheck Witbank, having worked with the company for 14 years as an analyst and a site manager

Howzit China!

This year, China was the destination for the annual International WearCheck Group (IWCG) meeting. Each year, member countries meet in a different part of the world to hear industry news from fellow industry leaders, to learn about the latest technological advancements in condition monitoring and to maintain invaluable dialogue with other IWCG members.

Spotted in China in July at the IWCG meeting are members of the International WearCheck Group (IWCG), from all corners of the globe, including South Africa, Hungary, China, Spain, Canada and England. WearCheck MD Neil Robinson is standing seventh from the left

2016 TRAINING COURSES

Venue	NetCheck: Software Package	Oil Analysis 1: Understanding oil and its analysis	Oil Analysis 2: Report interpretation
Course length	One full day	Two full days	One full day
Gauteng (Kempton Park)	On request	18, 19 October	20 October
Northern Cape	On request	15, 16 November	17 November

COSTS

Oil Analysis One covers two full days and costs R5 250. Oil Analysis Two and the NetCheck course cover one full day each and each costs R2 650. [Please note that the Oil Analysis Three course will not be run this year]. All courses include course material, refreshments, giveaways and certificates. Prices exclude VAT and are subject to change.

BOOKINGS

For more details on course content, view Training at www.wearcheck.co.za. For bookings phone Kay Meyrick on (031) 700 5460 or email training@wearcheck.co.za.

ON-SITE TRAINING

All courses can also be presented at the customer's premises for a minimum of seven delegates.

WearCheck also offers two more on-site courses:

- WearCheck Practical (in English or Zulu), a half day course costing R650 plus VAT per delegate
- WearCheck Customised – oil analysis for workshop technicians, a full day course costing R1 525 plus VAT per delegate.

For on-site training, there may be an additional charge for the lecturer's travel and accommodation, if needed.

ARRANGE A TRAINING COURSE NEAR YOU

Training courses can also be arranged in any of the following areas:

Bloemfontein
Cape Town
Kimberley
Makopane
Middelburg
Nelspruit
Port Elizabeth
Rustenburg
Steelpoort
Botswana
Namibia
Tanzania (Mwanza)
Zambia (Kitwe)

RELIABILITY SOLUTIONS TRAINING COURSES

Mobius training is offered in 153 countries, and is recognised the world over as the preferred standard for reliability solutions technicians. Mobius courses are run by WearCheck on demand. Courses include Alignment, Balancing, Awareness, and CAT I to III, and costs are as follows:

One day on-site condition monitoring overview:

1) Per class of up to 15 students	US$1 118.00
2) Instructor Fees	US$700.00

Four day non-certified basic - preparation for CAT I or CAT II

1) Per class of up to 15 students	US$1 118.00
2) Instructor Fees	US$2 800.00
3) Course Manual	US$69.00

Five day on-site CAT I: MIBoC certification (As per ISO 18436)

Per Student	US$240.00
2) Instructor Fees	US$3 500.00
3) Per Certification (Exam)	US$315.00
4) Per Course Manual	US$69.00

Five day on-site CAT II: MIBoC certification (As per ISO 18436)

1) Per Student	US$300.00
2) Instructor Fees	US$4 100.00
3) Per Certification (Exam)	US$375.00
4) Per Course Manual	US$69.00

Five day on-site CAT III: MIBoC certification (As per ISO 18436)

1) Student	US$440.00
2) Instructor Fees	US$4 100.00
3) Certification (Exam)	US$440.00
4) Course Manual	US$69.00

Alignment and Balancing	**TBA**

**prices exclude VAT, and exclude travelling, accommodation costs for the instructor. Costs are valid until the end of 2016. Client is responsible for providing a training facility and equipment, with a maximum of 20 students per class. WearCheck reserves the right to re-quote if the Rand: US$ exchange rate strengthens to 13:1. All RSA prices are quoted in ZAR.*

Note: the condition monitoring overview courses do not include any training material, and a minimum of six candidates is required for all training courses.

To book a Mobius training course, please contact Christene on christenef@wearcheck.co.za or call WearCheck Johannesburg on (011) 392-6322.

QUALITY MANAGEMENT REVIEW MEETING

WearCheck managers from various divisions around the country gather regularly for a Quality Management Review meeting, to assess progress on many projects and to participate in ongoing dialogue with management colleagues. Pictured at the most recent meeting in Durban are (back row, from left to right) Loshini Govender , Prinda Narasi , Eddie Perumal, Philip Schutte, Neil Robinson, Michelle Padayachee, Scott Sowman, Ashley Mayer, Philip Croucamp, and at the front (from left to right):John Evans and Steven Lumley, [Absent: laboratory manager Meshach Govender]

WEARCHECK FAMILY NOW INCLUDES ZIM

Zimbabwean mining and industrial operations now have their very own local WearCheck laboratory, right on their doorstep!

WearCheck, recently acquired the long-established oil analysis laboratory in the form of Harare-based Tribology Services, and brought it into the WearCheck fold.

The Zimbabwean laboratory has been operating for 27 years, and already services a wide range of clients.

The WearCheck way is to help customers save money and time via a convenient "one-stop-shop" offering the full spectrum of reliability solutions to getting plant to perform at its peak. As well as traditional oil analysis, WearCheck Zimbabwe also conducts thermography, vibration analysis, balancing, laser alignment, motor current analysis and milling.

WearCheck managing director Neil Robinson is pleased with the company's expansion. 'We are delighted to welcome all existing and new customers to use WearCheck Zimbabwe's services. The transition – smooth to date – benefits customers by giving access to the full range of WearCheck services. Our laboratory instruments are constantly upgraded to remain at the forefront of international standards, while our staff members attend ongoing training courses to keep ahead of global condition monitoring trends.'

'All original staff at the laboratory have remained, and have undergone WearCheck training. We are currently equipping the laboratory with extra analytical instruments to align the test profiles with other WearCheck laboratories – next on the list for Zimbabwe is a new viscometer.'

WearCheck Zimbabwe offers on-site sampling, as well as a 24-hour sample turnaround. Contact WearCheck Zimbabwe at 23 Amby Drive, Msasa, Harare, or via telephone on +263 4 446-369/71 or cell +263 712 631-026, or email service@tribology.co.zw

Harare-based Tribology Services was recently been taken over by WearCheck. Some of the lab technicians took a break for a photograph – they are, from left Nikanori Chikati, Talkmore Siyengi, Admire Katanda, Frank Chakonda, Rangarirai Mlambo, Emanuel Mhari and Victory Dumbura

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.

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. Before you do this, why not check out the 62 titles already available on the web site: www.wearcheck.co.za/info/Technical Bulletins

JOINING TOGETHER TO SUPPORT THE PLANET

If you would prefer to receive future issues of WearCheck Monitor and Technical Bulletin via email in pdf format instead of in printed form, please email a request to: support@wearcheck.co.za. This option also applies to printed reports.

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