WEAR CHECK® AFRICA
A member of the Set Point Group

MONITOR
ISSUE 60

WEAR CHECK
CONDITION MONITORING
THROUGH OIL ANALYSIS

FUEL DILUTION PROBLEMS EVAPORATE WITH NEW GAS CHROMATOGRAPH

Accurate and precise quantification of fuel dilution in an oil sample gives greater insight into the nature and extent of fuel problems in diesel engines.

And this is the exact nature of the data provided by the brand new Perkin Elmer Gas Chromatograph (GC) Clarus 580 model that WearCheck has installed in its Middelburg laboratory.

The new fully-computerised GC tests fuel dilution in oil samples and can determine the quantity of fuel to the closest half a per cent.

Laboratory manager Paul Swan, who oversees all seven of WearCheck's laboratories in southern Africa, Middle East and India, emphasises the importance for laboratory test results on fuel dilution to be both accurate and precise, and not only one or the other.

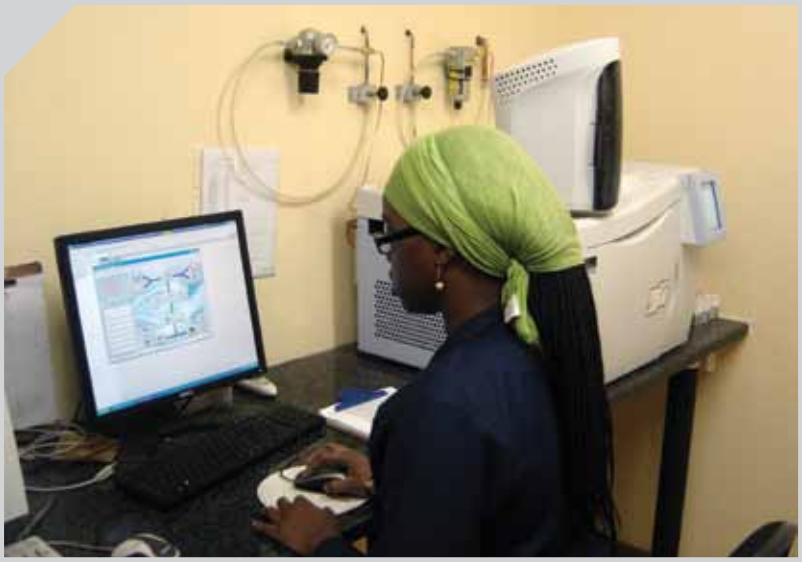
Swan is confident that WearCheck customers are benefiting from the best available international testing technology. 'After careful research, we selected the Perkin Elmer GC – they are renowned as top international lab equipment manufacturers, which aligns with WearCheck's positioning as leading international oil analysis specialists.'

WearCheck first invested in GC technology over 20 years ago, and currently has two other Gas Chromatographs in their Pinetown laboratory, with more planned for the future.

The new GC can detect when a fuel dilution problem is due to poor sampling versus the operation of the engine, thus indicating appropriate corrective action.

'This accurate and precise information is absolutely critical to WearCheck's diagnostic team. Knowing the exact amount of fuel often gives insight into where the fuel is coming from and may pinpoint what component in the fuel system may be at fault.

'Fuel fresh from the pump has a different chemical make up to fuel that's been aged by spending time in the sump - other testing techniques cannot tell the difference, but the GC can. This is also very useful information for the diagnosticians,' explains Swan.



The use of the Gas Chromatograph (GC) for the determination of fuel dilution in engine oils is a particularly involved analysis that requires skilled lab technicians. Here, lab assistant Nozipho Ngubane operates WearCheck's new PerkIn Elmer GC Clarus 580 in the Middelburg laboratory

Ideally, fuel dilution in an engine is 0%. In reality, this is never the case, therefore the dilution is monitored to determine the seriousness of the problem.

4 – 7% of fuel dilution in oil is some cause for concern, while dilution of greater than 7% could indicate the engine requires urgent corrective action. The exact limits are dependent on the type of oil and how long it has been in use as well as the make and model of the engine.

WEARCHECK CELEBRATES 15 YEARS OF ISO CERTIFICATION

Consistently accurate results, world class customer service and legal compliance with all business and environmental legislation – this is just part of the ethos that has driven WearCheck's absolute commitment to the very best in quality since its inception more than 30 years ago.

WearCheck proudly received its original ISO 9000 Quality Management System certification award 15 years ago after many months of hard work by all members of staff, making their quality-centred philosophy official and recognised on a worldwide basis.

The SABS (South African Bureau of Standards) carried out the initial audit in 1996 and continues to audit all facets of the company on a regular basis. The SABS is an accredited organisation for the ISO (International Organisation for Standardisation).

Regular revisions of the ISO 9000 system by the ISO ensure that it is a dynamic, living certification and able to encompass new scenarios as they develop. WearCheck has risen to the challenge of each revised system update without a single falter, and met all requirements for the current certification (ISO 9001 : 2008).

Five years ago, WearCheck also received ISO 14000 Environmental Management System certification in recognition of its adherence to the code that regulates how companies interact with the environment, including efforts to recycle waste materials and the disposal of waste that cannot be recycled in an environmentally responsible manner.

All WearCheck branches are audited on an annual, and sometimes bi-annual, basis and compliance with both codes of practice are assessed, and in 15 years of auditing, apart from a few minor non-compliances, not a single major non-conformance has ever been raised.

The driving force behind this close adherence to the Quality and Environmental Management Systems has been WearCheck's quality administrator, Melanie Hynd, who has been with company for more than two decades and has been involved in the implementation of quality and environmental systems from the word go.

Along with her team of volunteer internal auditors, including members of the quality committee and members of the management team, each and every aspect of WearCheck's daily operation is regularly scrutinised, reviewed and adjusted where appropriate – continual improvement is core to the codes of practice and WearCheck's way of doing business.

Melanie recalls the early days: "When we initiated the ISO 9000 application, we had to make many process changes, right down to the way the tests are run in the labs. The ISO systems are process-driven, and not person-driven, which eliminates any error margins and these processes are then easily replicated in all our new labs and branches".

WearCheck's quality administrator Melanie Hynd

"Our staff members are constantly witnessing examples of how the ISO systems make WearCheck a more efficient machine. Having the company's support and commitment to the project from the top management all the way down has made WearCheck's adherence to the strict ISO requirements a much less arduous task", she said.

'Our quality committee's efficiency is enhanced by the fact that members of management are actively involved, enabling decisions relating to quality to be made there and then, and put into action straight away.'

In addition to ISO certification, WearCheck's marine oil analysis programme boasts certification by two other international bodies – Paris-based Bureau Veritas and Lloyds of London Register.

Not a company to rest on its laurels, WearCheck's philosophy of continual improvement has driven the company to new, even more stringent heights in quality compliance – the company has recently embarked upon the implementation of the ISO 17025 laboratory centric quality management programme.

Melanie believes that the certification process is extremely beneficial to company and clients alike. "This recognition from these esteemed international bodies is an honour for WearCheck, and benchmarks us competitively against current international standards. Our customers can be assured of world-class service."

CONDITION MONITORING PAYS DIVIDENDS AT CONCOR PLANT

'Condition monitoring plays a primary role in maintaining our extensive fleet of construction plant and equipment,' Eric Baker, Concor Plant's technical manager, says. 'This proactive approach has paid significant dividends in terms of eliminating mechanical failures and generally optimising our fleet's operational efficiency and performance. Since we engaged oil and fuel analysis specialists WearCheck to initiate a continuous programme of oil and wear particle analysis on our plant in 2009, the savings have been substantial.'

Condition monitoring is a key element in planned maintenance, allowing remedial action to be taken to avoid the high cost and lost time consequences of component failure. Condition monitoring of plant and equipment is based on trend analysis and regular sampling. Concor Plant has close to four hundred major items being monitored on the WearCheck system and Baker says this goes a long way towards ensuring the reliability of the fleet.

All large frontline machines fitted with hour meters are monitored at regular intervals at site level to flag potential problems, notably in regard to the high cost items such as drive train components. The WearCheck system has been implemented at all Concor Plant sites, where samples of diesel, oil and coolant are taken from equipment at predetermined times. For example, engine oil is sampled every 250 hours. Each piece of equipment has a unique plant number and each component is tested and flagged separately

Samples are analysed at a WearCheck laboratory and where these tests flag a potential problem, additional testing is carried out to identify the root cause. At least 90% of all samples are processed within 24 hours. Concor Plant sites have internet access to the data on their specific machines, while the

company's head office can access the data for the entire fleet. The system also allows managers and directors to receive critical and urgent data.

The WearCheck system generates a comprehensive in-depth report on the actual condition of a component, provides a diagnosis and recommends the corrective action to be taken.

"The big issue is being able to identify a potential problem before it develops into a full blown failure," Baker says. "The analysis data is represented in a way that indicates the level of urgency and each of our sites is responsible for responding with the appropriate action to the sample data each and every day."

"Although the reports we receive are extensive, giving us information such as contaminants present, status of lubrication and viscosity, the system is only as good as the person monitoring it," Baker comments. "Site personnel are required to provide online feedback and should this not occur, the component will continue to be flagged on the system."

INTO AFRICA

WearCheck's Zambian operations are expanding – the current Lumwana mine laboratory will soon be one of two in Zambia, with the imminent addition of a brand new laboratory to the Kitwe office. WearCheck hosted an exhibition at the first Zimec (Zambian International Mining and Energy Conference), which was held in Lusaka in June.

ZIMEC 2011

DOWNLOAD OUR WORLD CUP RUGBY CALENDAR

WearCheck wishes you many enjoyable hours of watching World Cup rugby – make sure you don't miss a match by downloading WearCheck's special fixture calendar – free – from http://www.wearcheck.co.za/useful-info/rugby-world-cup-fixtures. **Go Bokke!**

Technical Tip – a distilled version of Technical Bulletin, issue no. 3

SILICON... ENEMY NUMBER ONE

(Original by WearCheck diagnostician Gary Blevins, N.D. Mech. Eng.)

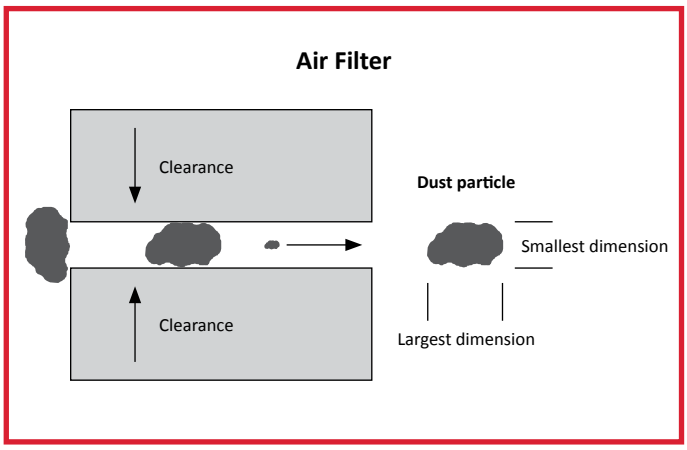
EXTERNAL CONTAMINATION OF LUBE OIL BY SILCON (DUST) IS A MAJOR CAUSE OF ACCELERATED WEAR.

After oxygen, silicon is the most abundant element in the earth's crust. Silicon does not occur naturally, but in several different compound forms, such as silica, silicates and silicones (man-made organic compounds).

Silica and silicates are abundant in the earth's crust, and are highly concentrated in natural soils and dusts. Therefore, silicon is used as the main indicator of dust entry into a component.

Drier climates, such as South Africa and the Middle East, have high dust levels. Airborne dust particles vary in shape, size and abrasive properties.

In an engine, the ingress of atmospheric dust is primarily through the air intake. 99% of this dust is removed by efficient air filters, with the remaining 1% entering the engine and passing between piston, rings and cylinder and eventually becoming suspended in the lubricating oil.



The dust particle with the smallest dimension of a similar size to mechanical clearances does the most damage.

Ideally, the working surfaces of a component are kept apart by a thin film of oil, which prevents direct contact between the surfaces, reducing the amount of friction and the rate of wear. The film also absorbs shock loads and helps distribute the load over the whole surface.

The introduction of even a small amount of dust will seriously disrupt this equilibrium by forming a direct link between the two surfaces and nullifying the beneficial effects of the oil film.

The first effect of the dust particle is scratching of the surfaces. Secondly, and more seriously, the dust particle changes the loading between the two surfaces from an even distribution to a point load concentrated on the particle, with a tremendous increase in pressure at this point.

Oil analysis is a reliable way to detect dust early and significantly enhance the life of a component.

When an engine has a dust entry problem, the type of wear that takes place is related to the manner in which the dust enters. Therefore, by examining the type of wear, it is possible to discover how dust is entering the system.

An oil analysis report reveals four possible wear patterns: 1. Normal wear, 2. Increased top-end wear, 3. Increased bottom-end wear and 4. All wear rates increased.

For a more in-depth discussion on silicon and an analysis of the types of wear in relation to the dust entry point, please visit www.wearcheck.co.za/news/technical-bulletin (Issue 3).

DEPARTMENT OF TRANSPORT WINS WITH WEARCHECK

The KZN Department of Transport has entrusted the condition-monitoring of its entire fleet to the WearCheck oil analysis programme. The Department first signed up with WearCheck's oil analysis programme in 1980. Today, over 1000 vehicles and items of road making plant are included in their programme.

Investment in oil analysis gives excellent returns when the programme is well-managed. The KZN Dept. of Transport recognises and rewards the depot with the best-performing, best-managed oil analysis programme to ensure good returns on their ongoing investment in oil analysis.

WearCheck initially donated a trophy to acknowledge the efforts of the best performing depot. This has now been extended to recognise the best depot in each of four KZN regions, for which WearCheck sponsored four new trophies.

Pictured here is WearCheck managing director Neil Robinson (left) handing over the new trophies to Sizwe Ndlovu and Mark Pistorius of the KZN Dept. of Transport

MAKING HEADWAY

Herman Geldenhuys

GEARING UP IN GAUTENG

Herman Geldenhuys has joined WearCheck as a technical support consultant, and brings a wealth of technical expertise to the Johannesburg / Pretoria team.

Herman is well-acquainted with the mechanics of big engines, having spent five years working for German engine manufacturers MTU. This job took him on a specialised six week training course in Germany, and sent him around South Africa to work on machines in various industries, including those used on the SA Navy ships, in trucks, as well as on all mining machinery.

With expansive knowledge of engines, Herman's experience includes electronics diagnostics, doing dynotests on rebuilt engines and in-depth field service problem-solving. Prior to joining WearCheck, Herman underwent intense diagnostic training, with a focus on the computerised aspect of machinery and upgrading, downgrading and wiring engines.

After completing his MDT2 and assessor course at college and working in the industry, Herman also lectured to automotive students at Solidarity Tech.

EXPANDING STEELPOORT SERVICES

Quintin Ras is WearCheck's new technical support consultant based in the Steelpoort branch, where his technical know-how is being put to excellent use on machinery and transformers in the area.

Bringing with him more than five years' experience in the mining and steel industries, Quintin is well-placed to provide practical, hands-on expertise to local clients.

Prior to joining WearCheck, Quintin worked as a mining drill operator, on the very machines from which he now takes samples. In addition, Quintin gained invaluable experience as a quality controller with MacSteel VRN, where he was responsible for the steel meeting stringent SABS standards.

Quintin is committed to ensuring 110% quality service, and encourages clients to use WearCheck's on-site sampling service.

Quintin Ras

OUT AND ABOUT

WearCheck staff conducted a variety of training courses for customers and related industries recently, some of them in unusual and challenging locations.

The SAIT (South African Institute of Tribology) holds a five day Lubrication Engineering course in various centres around SA annually. WearCheck's diagnostic manager John Evans presented the oil analysis section of the course when it was held in Durban during May.

Diagnostician Quinton Verster did a presentation to diesel optimization systems producers, Diesel Power, on the importance of using the correct oils at the right time.

Senior technical consultant Ashley Mayer ventured further afield to a uranium mine and a road construction site, both in remote northern Namibia, where he ran several courses for Avenge Grinaker LTA on the Basics of Lubrication and Oil Analysis.

Both sites experience extreme weather conditions and, not only are they difficult to reach, it is also a challenge to run a fleet of heavy machines in these conditions.

Diagnostic manager John Evans

Diagnostician Quinton Verster

Senior technical consultant Ashley Mayer

WEARCHECK RUNS TRAINING COURSES ABROAD

More than 100 customers of WearCheck PM in Dubai attended training courses held in the Middle East. These courses were presented by Pinetown-based diagnostician, Steven Lumley when she visited the area in March and April this year.

In Dubai, the specially tailored, one day course entitled An Introduction to Oil Analysis was presented on seven consecutive days in order to accommodate all the delegates who had shown interest in the course. Galadari, the Komatsu agents in Dubai, even requested a course be held at their premises for their staff and agents.

Says Steven, 'It is wonderful to note how well the course material was received. It is very encouraging to see such an interest being taken in condition monitoring techniques, such as oil analysis, that have the potential to substantially reduce running costs.'

Pictured here with diagnostician Steven Lumley (third from left in black) is a group of delegates from Aggreko, a company that supplies power generation equipment. Many operations in the Middle East, and worldwide, depend on generator sets for their electricity. Aggreko is WearCheck PM's largest customer, and relies on oil analysis to keep their generators in peak operating condition

Steven inspects a Komatsu grader with Anders Prytz, operations manager for Galadari Trucks and Heavy Equipment. As the Komatsu agents in Dubai, Galadari is responsible for sales, maintenance and service of Komatsu earthmoving equipment

WEARCHECK ENTERS INDIAN WIND TURBINE INDUSTRY

WearCheck Laboratories India, which opened its doors in Chennai (formerly Madras), India towards the end of 2010, is thriving under the leadership of national manager Nissar Ahamed, and has begun servicing a range of industrial clients. One of their biggest customers, Gamesa, manufactures wind turbines.

Pinetown-based diagnostician Steven Lumley recently visited the Indian office and was present on WearCheck's stand at the international Wind Turbine Expo in Chennai.

WearCheck is currently putting the finishing touches to a specifically-designed wind turbine test kit, which will be launched early next year.

WearCheck diagnostician Steven Lumley attended the International Wind Turbine Expo in Chennai, India recently. With her is one of WearCheck Laboratories India's biggest clients, Mr D. Hemkumar, assistant manager of wind turbine manufacturers Gamesa

WEARCHECK SOUTH AFRICA HOSTS INTERNATIONAL OIL ANALYSIS CONFERENCE

The annual WearCheck International (WCI) conference, at which delegates from WearCheck offices around the globe gather to compare notes and hear presentations on cutting edge developments in the oil analysis industry, was hosted by the Pinetown office in July.

The group was addressed by several international speakers, among them Fedya Babonovic of leading American laboratory manufacturers Perkin Elmer. Perkin Elmer will be designing and manufacturing highly specialised, customised laboratory equipment to meet the specific technical requirements of WearCheck in the future.

Members from WearCheck branches in Canada, Hungary, Belgium, England, the USA and Spain enjoyed the warm hospitality of WearCheck South Africa. This is the third time that the WCI forum has met on African soil.

WINTER WARMTH FROM WEARCHECK WORKERS

Pinetown-based WearCheck staff recently clubbed together to donate money for blankets for the needy, as part of an East Coast Radio Winter Warmth campaign. WearCheck matched the staff donations rand for rand, and a whopping R11 710 was raised, enabling 334 blankets to warm the underprivileged this winter.

Pictured at the blanket handover is East Coast Radio DJ Makhosi Khoza (centre), flanked by Francis Berner and Scott Sowman from WearCheck Pinetown

CHILDREN CHEER FOR CHOCOLATES

Kiddies at the St Vincent Children's Home – an orphanage in Mariannhill, KZN – were overjoyed to receive a sweet surprise when WearCheck staffers opted to donate their Easter eggs to the 110 children who live there, and who rely largely on donations.

Members of the WearCheck Internal Company Committee (WICC) who delivered the chocolate treats to the cheering children were (back, from left): Michelle Padayachee, Steven Lumley, Vanessa Govender, Anneline Chinsamy, Elizabeth Mbambo and Scott Sowman

2011 TRAINING COURSES

VENUE	NETCHECK: SOFTWARE PACKAGE	OIL ANALYSIS 1: UNDERSTANDING OIL AND ITS ANALYSIS	OIL ANALYSIS 2: REPORT INTERPRETATION	OIL ANALYSIS 3: MANAGEMENT
Johannesburg	17 Oct	18-19 Oct	20 Oct	21 Oct
Rustenburg		20-21 Sep	22 Sep	23 Sep

Note: the 2012 training course dates will be released shortly.

COSTS

Oil Analysis One covers two full days and costs R3 990 plus VAT. Oil Analysis Two and the NetCheck course cover one full day each and each costs R1 995 plus VAT. Oil Analysis Three is a half-day course and costs R850 plus VAT. All courses include course material, refreshments, giveaways and certificates. Prices are subject to change.

For more details on course content, view Training at www.wearcheck.co.za.

BOOKINGS

For all bookings phone Michelle van Dyk on (011) 392-6322 or e-mail 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 R475.20 plus VAT per delegate
- WearCheck Customised – oil analysis for workshop technicians, a full day course costing R1161.60 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 the following places:

Bloemfontein
Cape Town
Kimberley
Makopane
Middelburg
Nelspruit
Port Elizabeth
Rustenburg
Steelpoort

Botswana
Namibia
Tanzania (Mwanza)
Zambia (Kitwe)

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 e-mail melanie@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 e-mail your suggestion to Melanie@wearcheck.co.za. Before you do this, why not check out the 49 titles already available on the web site: www.wearcheck.co.za/bulletins.htm

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KWAZULU-NATAL
9 LE MANS PLACE
WESTMEAD, PINETOWN, RSA
PO BOX 15108, WESTMEAD 3608
TEL: +27 31 700 5460
FAX: +27 31 700 5471
support@wearcheck.co.za
www.wearcheck.co.za

WEAR CHECK® AFRICA
A member of the Set Point Group

GAUTENG
30 ELECTRON AVENUE
ISANDO, RSA
PO BOX 284, ISANDO 1600
TEL: +27 11 392 6322
FAX: +27 11 392 6340
support@wearcheck.co.za
www.wearcheck.co.za

Sharon Fay Public Relations 08/2011