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CONTENTS

Optioil – Fluid Management 365

Bypass filtration at a Vattenfall power plant –
Maintenance worker and Optioil specialist taking an oil sample.

Cloppenburg-based Optioil GmbH offers professional fluid management with an emphasis on ecological sustainability – 365 days a year. With its trained and certified specialist staff as well as its extensive equipment, the company is a expert and manufacturer-independent partner in all matters relating to lubricant care.

In addition, Optioil makes a substantial contribution to minimising damage to the environment – because oil care produces a marked reduction in CO_2 emissions. The company's range of services covers all areas relating to the professional fluid management of system oil charges: oil analyses and purity checks, filtration technology and drying, system cleaning and disposal. Optioil works for the customer by ensuring the maximum operational safety of all components that are supplied with oil. Its experienced practitioners can overcome major challenges in a professional and sustainable way.

Maintenance instead of disposal

Oils are indispensable for the operation of e.g. turbine and hydraulic systems. However, operational stoppages during oil changes, the disposal of waste oil and acquiring new oil can substantially increase operating costs. This is where Optioil's philosophy comes into play: maintaining the oil and thus being able to use it for longer not only saves procurement and disposal costs but also reduces the impact on the environment. After all, the disposal of every litre of oil adds approximately 2.6 kg CO_2 to the atmosphere. Every litre of well-maintained oil that continues to be in use helps protect the environment.

Holistic, not selective

Before every treatment, Optioil gathers all available information about the lubricants used. The system, the lubricant type and the individual service conditions – all these facts are considered as an interactive whole. An OELCHECK lubricant analysis specially selected for each usage case contributes by supplying the most important data about the condition of the oil. Together with the customer, Optioil then draws up a schedule of what steps to take next. After this, Optioil carries out the measures required, such as a special filtration or a drying of the oil, a system clean or – in the worst case – an oil change.

For large and small

Optioil primarily deals with hydraulic and turbine fluids. This can involve both smaller amounts of hydraulic oil from personal or goods lifts, as well as several thousands of litres, such as from body presses in the car industry, injection-moulding machines in plastics processing or bale presses in recycling plants. Turbines and jet-engine compressors from power plants and the chemical industry

Check-up

Our industry and the economy are on the threshold of the fourth industrial revolution. Production is becoming highly flexible. Through the introduction of self-optimisation, self-configuration and cognition processes, the automation technology needed for this has to become more intelligent and do more to support people in their increasingly complex work. At the same time, the real and virtual worlds are increasingly merging into an ‚internet of things'. The use of mobile, smart devices will quite soon overtake that of stationary ones. In addition to the popular smartphones, ‚intelligent objects' are increasingly helping us in our everyday lives.

For us at OELCHECK, the new era has already long begun. The automation technology in our laboratory is state-of-the-art. It makes the work of our staff easier and at the same time ensures that processes for the examination of samples and data management are even more reliable. The ground-breaking new version of our **www.lab.report** online portal means big changes for our customers as well.. Even for apparently simple processes like taking an oil sample, self-optimisation, self-configuration and cognition are the name of the game. And with your mobile devices and our QR codes on your machines, you already have access to the small intelligent objects that will make your working life easier, and not only when working directly with the machines. Welcome to the digital service world of OELCHECK!

Yours, Barbara Weismann

will work in a highly efficient manner and under extreme continuous loads. Optioil monitors and maintains the turbine oils, thus ensuring the systems' reliable availability.

Support from OELCHECK

The specialists of Optioil have been familiar with OELCHECK for years. They use the lubricant analyses for initial diagnostics, control, preventive and documentation purposes. The analyses also play an important role in testing cleaned and/or dried oils for suitability for further use. A treated lubricant is only used again if the trend comparison of laboratory results shows a noticeable improvement in behaviour. The assessment examines – among other things – the purity of the oil, the remaining water content and – for turbine oils – also signs that deposits, i.e. a ‚varnish', may have formed. Several thousand litres of oil are in use in turbines and large oil circulation systems, often for several years. This can result in the depletion of additives or the formation of ageing products in the oil. Without careful monitoring through trend analyses, sludge-generating contaminants or adhesive reaction products remain undiscovered for a long time. ‚Varnish' can be deposited on control valves and plain bearings, and reduce the flow of oil or accumulate as oil sludge in oil-bearing pipes or in the tank. Optioil minimises the risk with regular trend analyses, and in particular OELCHECK's MPC test.

Before and after the perfect tank clean by Optioil.

The MPC test (Membrane Patch Colorimetry) is the only standardised test method in the world that can not only detect insoluble oil residues, but also quantitatively evaluate them. The MPC index is expressed as a numerical value between 0 and 100. The higher the MPC index, the greater danger that sludge and varnish-like deposits will form. For turbine oil, the upper limit value lies at 60.

MPC-Test (Membrane Patch Colorimetry)

Last-minute rescue

One German-based company that regularly uses Optioil's services is Vattenfall – one of Europe's largest energy producers. In one Vattenfall power plant, consistent monitoring of the oil in a gas turbine has already more than paid for itself. In the summer 2014, the turbine oil was examined as a precautionary measure for possible deposits using an OELCHECK MPC test. The MPC index ascertained was extremely high.

An immediate danger therefore for the 17,000 l of turbine oil and the gas turbine's operational safety! However, Optioil knew what to do. Instead of a costly system clean and the resulting stoppage, a special varnish filtration technology was deployed that, acting as a kind of artificial ‚kidney', was used to continually remove the contamination. The values of the oil were constantly monitored in the OELCHECK laboratory, and when, after only four weeks of by-pass filtration, the MPC index had fallen to an impressive 7.5, the proof was in: the varnish filtration technology deployed by Optioil had proved its effectiveness.

By the way: Another Vattenfall coal-fired power station has placed its trust in Optioil's comprehensive Fluid Management 365. This includes complete oil analytics in cooperation with OELCHECK and Vattenfall, as well as all service and lubrication work on the moving components.

Optioil GmbH is a young, up-and-coming service company with experienced and certified specialists. From its company home in Cloppenburg, Optioil is active nationwide. Branch offices in Berlin and the Cologne/Bonn area ensure additional proximity to customers/ Not without reason is the company motto ‚Fluid Management 365'. In everything from oil analysis and maintenance, cleaning and drying to filtration engineering, Optioil is your expert partner in all areas of fluid management – and this 365 days a year.

Further information: www.optioil.de.

The elements in a lubricant sample – wear, contaminants or additives?

Fire, water, air and earth – well into the 18th century, alchemists believed there to be just four elements. In modern chemistry, 118 elements – from hydrogen to ununoctium – have so far been defined in the periodic system and classified according to various criteria. They are commonly divided into elements that form metals and constitute the bulk of the periodic table, non-metals and the intermediate category of the metalloids.

For good reason, the quantitative determination of the elements present in lubricants lies at the heart of lubricant analysis. After all, there is no oil, grease or assembly paste that does not occasionally contain several metallic elements. Since no additive package and hardly any grease thickener can do without them, they are already present in factory fresh products. Used oils or greases contain even more elements/ These are mostly either wear-induced particles originating in the lubricated component, contaminants or constituents of another lubricant.

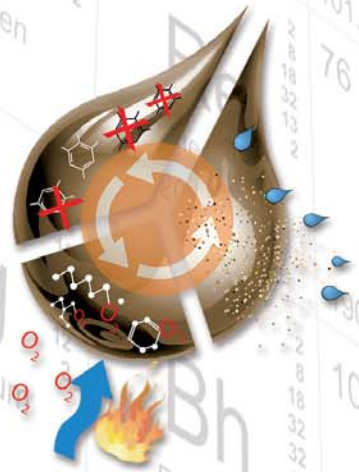
However, no matter what their origin, an element analysis using an ICP or RDE device can detect practically all of them in a standard-compliant manner. OELCHECK laboratory reports list up to 30 separate elements in concentrations of mg/kg (ppm) – and thus far more than the 18 elements in the standard studies by competing laboratories. In addition, the PQ Index (Particle Quantifier) also makes it possible to distinguish between corrosive, non-magnetic metal wear on the one hand, and abrasive, magnetisable metal wear on the other.

The elements in the OELCHECK laboratory report

The OELCHECK laboratory report lists the elements only once, in the categories in which they are most commonly found: Wear, contaminants and additives. The origin of some elements cannot be clearly determined, however. These will be listed under the category where they are usually found in new oil. A typical example of such an ‚indeterminate element' is zinc. Very many HLP hydraulic oils include a wear-and-tear-reducing additive combination that contains zinc. However, zinc can also result from the wearing of zinc die-cast components. In addition, zinc can appear as a contaminant from zinc-plated components, paint coatings that contain zinc or vulcanised tubing materials. Using something close to detective work, the practised diagnostic engineer then decides what caused an unexpectedly changed zinc value.

Wear

Elements categorised as resulting from wear can form as corrosive wear, which is partly chemically dissolved in the oil, or as a result of mechanical-abrasive, particle-induced wear. The aim of the lubricant analysis is to evaluate the extent of the



wear by the changes in the elements detected in a sample. With the help of the metals or metal combinations found in the sample, any unusual wear in the affected components can be so accurately categorised that a targeted on-site inspection of the relevant components, such as rolling or plain bearings, pumps, valves, pistons or cylinders, can be carried out.

Contaminants

Often contaminants can get into the lubricant in the form of dust. It will appear in the list of elements as silicon, which can however also be an anti-foam additive. Calcium – normally an additive – can also occur as contaminating chalk dust. Aluminium, which is usually a sign of wear, is a contaminant if present in the form of bauxite.

In addition to water, residues from manufacturing processes, release agents, assembly aids or traces of other lubricants can also sometimes harm the oils. Synthetic oils in particular release contaminating elements from the components they are in contact with. These can be lubricated parts, but also filter elements, seals or coats of paint.

Contaminants are almost always a potential hazard. They can accelerate the aging of the lubricant, cause foaming or encourage wear. One of the aims of each lubricant analysis is to detect contaminants as early as possible, so that any negative impact can be prevented by a timely oil change or treatment measures.

Additive

Under this heading, the laboratory report lists elements that were mostly added as organometallic (oil-soluble) combinations or – more rarely – as dry lubricants (MoS_2). A comparison of the used oil values with new oil provides indications of possible additive depletion or mixing. Markedly changed values may point to a deterioration in the lubricant's performance.

Interpreting the values

Our analysis devices for optical emission spectroscopy (OES) produce very reliable values, because after every 10 analyses, a control standard is measured. However, an assessment should not be made on the basis of a single value. After all, machines, engines and systems must be viewed individually, taking into account their different conditions of use. All this contributes to our diagnosis of an oil sample. The values are additionally calibrated with other values in a statistical analysis that includes samples of the same type of machine. The OELCHECK database contains results of more than 2.5 million samples. In addition, our diagnostic engineers can draw upon limit and warning values ascertained by them from 170,000 different machines for internal use. Nevertheless, statistical studies are always only tools. No two samples are identical. Their assessment relies strongly on trend observation and, ultimately, always the diagnostic engineer's expertise.

There can be no fixed, universal and time-independent limits for contaminants or metals produced by wear, because these always depend on the machine's service life, as well the length of time the oil or grease has been in use. For this reason, the limit values and/or tolerance ranges published in our table below should only be used as a general guideline for the service life and oil charge quantity that is typical of the use case in question. They are based on values from the OELCHECK database and our experience.

As a rule, an estimate of individually identified values should take into account:

- the larger the oil quantity
- the shorter the service life
- for engines: the lower the engine speed;
- for hydraulic systems: the higher the working pressure
- for gearboxes: the higher the circumferential speed, the lower the limit values for wear-induced metals should be set.

And please remember: all values should be considered in terms of their interaction with each other!

Hydraulic oils – Typical
taminants, add

		Wear					
Element	Sign	Warn-ing value	mostly in connection with	Possible causes	typical range	mostly in connection with	
Aluminium	Al	25	Si, Na, K, Cu	Die-cast parts, aluminium bronze, pump casings, guide mechanisms, plain bearings, oil coolers, multiple disc clutches, sealing rings	< 2	-	no significan
Antimony*	Sb	3	Zn, Pb, Cu	‚Hardened lead' (lead antimony alloys) and tin alloys in plain bearings, white metal bearings	< 2	-	no significan
Barium	Ba	2	-	Not a wear-induced metal in hydraulic oils	50–8000	S, P	Type A ATF (a
Beryllium	Be	3	Cu	Sintered metal bearings, Cu-Be alloys, ceramic components	< 2	-	no significan
Lead	Pb	10	Cu, Sn, W	Plain bearing running surface, pump casing, solder joints, rolling bearing cages	< 30	S, P	Friction-redu inhibitor in lu
Boron	B	12	Fe	Ceramic components, insulation bodies, brake and clutch linings	< 40	-	Cleaning sup
Cadmium*	Cd	3	Ni	Corrosion-resistant Ni-Cd alloy	< 2	-	no significan
Chrome	Cr	25	Fe, Cu, Al	Rolling bearings, vanes of vane pumps, chrome plated piston rods, pump raceway, other chrome plated components	< 2	-	no significan
Chlorine*	Cl	20	Fe, Cr	Abrasion of PVC plastic parts	< 2	-	no significan
Iron	Fe	50	Cu, Cr, Mn	Hydraulic pump, hydraulic motor, valves, pistons, rolling bearings, tubing, casings, pipes, tank, cutting-ring fittings	< 2	-	no significan
Potassium	K	15	Al, Si, Na	Die-cast parts of light-metal alloys	< 2	-	no significan
Calcium	Ca	5	V, Cl	rare alloy constituent, aggregate in PVC	< 3000	P, Zn,S	Detergent in also in lubric
Cobalt*	Co	2	-	Not a wear-induced metal in hydraulic oils	< 2	-	no significan
Copper	Cu	25	Fe, Pb, Al	Brass and bronze parts, control discs, pressure plates, pipes, oil coolers, rolling bearing cage, sealing and guide rings	< 2	-	no significan
Lithium*	Li	3	Al, Mg, Fe	Light metal alloys in aviation hydraulics	< 2	-	no significan
Magnesium	Mg	5	Al, Fe, V	Light-metal alloys for die-cast parts	< 1500	Ca, P, Zn, S	Detergent in
Manganese	Mn	3	Fe, Cu	Steel, high-grade steel, non-ferrous-metal alloys	< 2	-	no significan
Molybdenum	Mo	5	Fe, Mn	Pump and valve parts made of high-strength alloys	< 250	-	Molybdenum
Sodium	Na	25	Al, Si, K	Die-cast parts with light metal alloys	< 300	Ca, Mg, Zn, P, S	rare additive
Nickel	Ni	3	Fe, Mn	Nickel-plated supporting cores of filters, alloy constituent for valves, gearwheels	< 2	-	no longer sig
Phosphorus	P	10	Fe, Cu	Abrasion of phosphated (hardened) surfaces, phosphorus bronze	< 2000	Zn, S	Attrition and oils
Sulphur	S	30	Fe	Rare alloy constituent, abrasion of rubber or plastic materials	< 10,000	P, Zn	Wear-inhibiti
Silver*	Ag	3	Fe, Cu	Argentiferous solder joints	< 2	-	no significan
Silicon	Si	10	Al, Cu	Abrasion of light metal alloys, silicon seals	< 15	Ca, Mg, Zn, P	Anti-foam ac
Titanium*	Ti	3	Fe	High-strength steels in special hydraulic systems, springs on check valves, level indicators, ceramic parts	< 2	-	no significan
Vanadium*	V	3	Fe, Al	Chrome vanadium steel, titanium vanadium aluminium alloys	< 2	-	no significan
Tungsten*	W	3	Mo, Fe	Tool steel of W-Mo-Fe for high-strength parts	< 2	-	no significan
Zinc	Zn	70	Fe, Cu, Al	Oil corrosion on zinc-coated components (zinc-free oils)	< 1500	P, S	Wear-inhibiti resistance
Tin	Sn	25	Cu, Fe, Pb	Constituent of tin bronze, tin solder of cooler joints	< 300	P	In some synt

Elements marked with * appear in standard laboratory reports for hydraulic oils only for values over 1 mg/kg
(ppm)

warning values for con-
itives and wear

Additive	Contaminant		
Possible causes	Warning value	mostly in connection with	Possible causes
ce for hydraulic oils	10	Si, Ca	Dust from clay or loam floor, bauxite dust, bentonite, gel or aluminium complex grease
ce for hydraulic oils	7	Pb	Soft-solder constituent, pigments from coats of paint, antioxidant in lubricating grease
automatic transmission fluid) friction modifier	19	P, S, Zn	Mixing with Type A ATF, lubricating grease, assembly paste, corrosion inhibitor, hardening baths
ce for hydraulic oils	2	-	None known for hydraulic oils
ucing friction modifier (no longer in common use, in the past a wear ubricating greases and transmission oils)	8	Cu, Sn, W	Soldered connections
plement, friction modifier in engine and gear oils	20	Na, K	Cooling-grease and cooling-fluid supplement, fluxing agent for solder joints, detergent supplement, pesticide
ce for hydraulic oils	3	Cu, Sn, V	Dye pigments, disc brake lubricant, tin-lead solder in hard solders
ce for hydraulic oils	2	-	None known for hydraulic oils
ce for hydraulic oils	20	Fe, Na, K	Seawater, table salt, swimming-pool water supplement, chlorine gas, PCB, chlorinated refrigerants, supplement in some cutting fluids
ce for hydraulic oils	10	-	Additive in lubricant grease and assembly pastes
ce for hydraulic oils	15	Na	Gritting salt, artificial fertiliser or tap water, seawater, saline air, cooling water (glycol), cutting fluid
HLPD hydraulics and engine oils, thermal resistance, wear inhibitor, ating greases	15	Na, K, Si	Made of hard cooling fluid, engine oil, rock dust (e.g. dolomites)
ce for hydraulic oils	2	-	None known for hydraulic oils
ce for hydraulic oils	5	Fe, Pb, Al	Corrosion products, chisel paste
ce for hydraulic oils	3	Ca, Zn, P	Thickener of multipurpose grease, assembly paste
HLPD hydraulic and engine oils, thermal resistance	9	Ca, Zn, P	Mixing with engine oil, tap or waste water
ce for hydraulic oils	2	-	None known for hydraulic oils
-organic additives for the use of gear and engine oils	20	Zn, Ca, P	Mixing with engine oils or PD gear oils, MoS_2 in assembly pastes and greases
for the use of engine oils	19	Al, Si, K	Gritting salt, artificial fertiliser or tap water, seawater, saline air, thickener of lubricating greases, corrosion inhibitor made out of oil or antifreeze glycol (non-ferrous metal protection)
nificant for hydraulic oils	2	-	Nickeliferous assembly paste
corrosion reduction additive (high-pressure supplement) in almost all	10	Si, Ca, Al	Dust, artificial fertiliser
ng additive in almost all oils, constituent of mineral base oils	+ 1000	P	Mixing with hypoid gear oils
ce for hydraulic oils	3	Zn	Residue of silver solder because of corrosion by oils containing zinc
ddditive from oils	10	Al	Dust or arenaceous quartz; glass dust; silicon oil, grease or spray; plastic release agent; silicon sealing or caulking compounds
ce for hydraulic oils, rarely as a marking supplement	3	S	Titanium oxide in plastics, paper and printing colours
ce for hydraulic oils	2	-	None known for hydraulic oils
ce for hydraulic oils	2	Fe	Residue from welding electrodes
ng high-pressure additive, reduces friction (friction modifier), ageing	50	Fe, Cu, Al	Dye pigments, vulcanisation aids in tubing, mixing with oils containing zinc
thetic oils, depending on manufacturing process	2	-	None known for hydraulic oils

Notes on use

Information about the origin, amount and combination of elements in this table is based on typical used oil samples from mobile and stationary hydraulic systems. These metals were measured in more than 1 million hydraulic oil samples by means of ICP in the OELCHECK laboratory. Out of approximately 40 elements recorded by us in every sample, we often only mention those of the 29 elements listed here that show a value higher than 1.

OELCHECK is the only laboratory that uses calibrating standards for more than the 18 standard elements. Even rather rare or hard-to-determine elements like lithium, chlorine or manganese are calibrated within the range typically found in oils. Because no commercially available standards exist, the presence of some metals can only be exactly determined up to a concentration of 5000 mg/kg.

Please note, especially for wear-induced metals and some contaminants:

The typical warning values vary depending on the oil's current service life, as well as the size of the oil charge. The trend curve, which can be ascertained through regular analyses of the same aggregate, is also important.

Perform one to two analyses per year and supply data that is as complete as possible if you value getting a sound diagnosis by an experienced OELCHECK diagnostic engineer.

Intuitive working with the new customer portal
Submitting and managing samples, controlling actions.

www.laborberichte.com becomes **www.LAB.REPORT**

The OELCHECK customer portal www.LAB.REPORT (without .de or .com) has not only changed its address. The new interface offers additional functions that can be accessed more quickly!

Request login details and get going. Not yet a user of our **www.LAB.REPORT** customer portal? If you are a customer, navigate to **www.lab.report** in your browser and request your password by clicking on ‚Create account'. You will receive this immediately by email and should change it in your account settings after login. You can change your settings by clicking on your username.

All the customer portal's functions are available for you online at any time.

If you are already a user of www.laborberichte.com you can use your existing access details on the new portal. Even if you have not already examined samples on our site, you can try out the portal's functions with its analysis results of more than 200 example samples through the ‚Guest login' link.

Instead of just being able to search for and administer analysis data of all your samples, you now have access to a modern portal that can also be used with smartphones and tablets. Its intuitive interface gives you access to its enhanced functions. For example, you can now enter your own limit values for your machines and systems, and recognise trends with even greater precision, allowing you to organise the condition monitoring of your machines and lubricants in a more systematic and far more effective way. And all this with less data input and administrative effort!

The latest information at a glance

After you have logged in with your personal password, the number of unread laboratory reports in

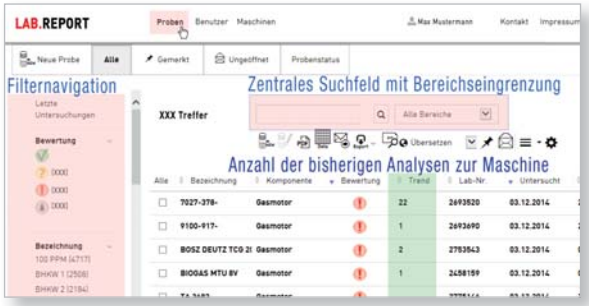
Status indicator of your samples

the relevant evaluation category since your last visit (up to a maximum of 30 days) appears in the coloured status bar on the right-hand side. By clicking on the red-coloured box, for example, you can deal with samples that, in the opinion of the OELCHECK diagnostic engineer, require action on your part. Under the ‚Unopened' tab, you will find an overview of samples that have not been viewed yet.

The ‚Samples' section

This gives you complete control over all your samples. Sort and filter according to a variety of different criteria and initiate desired actions using the icons.

Using the **central search field** in the middle of the screen or **filter sidebar** on the left, you can search for your samples and filter them according to certain criteria. Entering a search term or restricting the search in certain areas (dropdown menu next to the search field) changes the entries listed in the filter sidebar to the left. Inspired by the major search engines, this approach allows you to filter in such detail that you can, for example, easily forward laboratory reports or analysis results for single or several machine units. Alternatively, you can choose the unit for which you want to send in a new sample, without having to manually fill in a sample form.



‚All' tab

All samples to which you have access are listed under this heading. If ‚Recent analyses' is clicked in the left-hand filter sidebar, only the latest sample for the unit being searched for will appear as a one-line entry. In the ‚Trend' column you can then see how frequently a sample from the unit in question has already been analysed. The number of hits found next to the central search field is updated accordingly. By clicking on ‚All analyses' or ‚Reset all filters' analysed samples can be listed as a one-line entry again.

The ‚Unopened' tab

Samples that have been analysed in the past 30 days and whose data table or PDF laboratory reports are still unopened are listed here. Using the search field or the filter sidebar, you can easily add further filters.

‚Sample status' tab

If a sample has been received by us, where can it be found? Using the links ‚Samples not received', ‚Samples in laboratory', ‚Samples being diagnosed' you can view the status of the samples for which no laboratory report has been compiled yet. Under ‚All' you can also find samples that have already been examined.

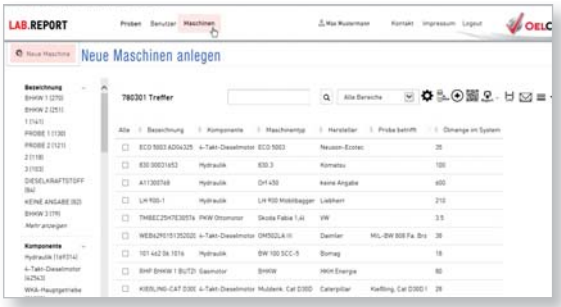
If your sample has not yet been received by us, you can, under ‚Samples not received', still use the icon to make corrections to your sample data.

If you only notice the necessary changes when the samples have already arrived at the laboratory, are awaiting diagnosis or have already been evaluated, then these changes can only be effected through our technical secretariat. The changes will then result in a charge or will only take effect in the next study.

The ‚Units' section

One of the main reasons for the creation of the new portal was to simplify the sample input process – via PC and now by smartphone and QR code as well!

Before you can submit data for new samples, the



unit to which the sample belongs has to be selected first. If a sample from the same unit has already been examined previously, the selection is easy.

If you want to send in the first sample for a unit, you can also register new units and their components under ‚Units'. Even if you do not want to send in a sample at the moment, you or your employees can already set the unit up in advance. Thus, a **QR-Code can be generated** and attached to the unit before the first sample is submitted. When entered by PC, the data will then be accepted seamlessly.
In addition, unit management allows you to set **your own limit values** for each component or its lubricant.

Using unit management you can:

- set up new units
- change unit data
- set up a component for a unit
- set limit, warning or threshold values
- submit different or additional recipients of laboratory reports
- generate or print QR code for sticking onto the unit or component
- export unit data in various file formats.

Our tip: be structured and systematic. Specify the person who has responsibility for managing the unit, if several employees have access. Create consistent criteria for all entries. Avoid setting up the same unit with different names. Otherwise, trend observation will be practically impossible.

Submitting a sample now by QR code and smartphone

Since December 2014, a square QR (Quick Response) code has been printed on the lower right-hand corner of all laboratory reports. Using the free QR Scanner app, the QR code can be read with your smartphone or tablet.
The code contains a direct link to the sample for which the laboratory report was compiled. Scanning the QR code on the laboratory report or the sticker on the unit will take you directly to the **sample input** for the unit in question. All you then have to do is to stick the laboratory number sticker from the sample form onto the sample container and write the oil's current service life on it. All the remaining information that you would otherwise have had to fill in on the sample form has already been stored with QR code.
If you would like to switch to making sample submissions by smartphone and QR code only, you can generate the QR code in ‚Units' and attach a printout to the unit.

‚Users' section

Everything at once, but still separate.
Are you managing and controlling oil analyses for more than one company department or various end users? Do you want to be able to grant your colleagues, customers or machine and lubricant manufacturers access to certain laboratory reports or selected units as ‚master user'? No problem! By clicking on the ‚User management' button, which has to be enabled by us free of charge upon your request, you can set all details:

- Define access rights for more users
- Set up, change, block, delete users
- Send access data by email
- Export user data.

Make your life easier.

- Stick the machine's QR code next to the oil access point and scan the QR code with your mobile phone when taking a sample. The machine will be found immediately in **LAB. REPORT**.
- Search in **LAB. REPORT** for the machine and click on the NEW symbol or scan the QR code of the previous laboratory report.
- Only fill in the fields for the laboratory number and the service life. Complete or change the remaining information when possible or necessary.
- Stick the laboratory number label from the sample form of the pre-paid analysis set onto the sample container.
- Simply send us your sample without the sample form once you have finished submitting the sample with your mobile device or PC.

Compare and evaluate

The new customer portal has made it substantially easier to submit new samples for trend analysis. The development of individual components is listed in a clearer manner and can be evaluated more quickly.

The new filter functions allow all data to be presented in a targeted manner and easily compared. This provides you with quick answers to specific questions such as:
Which lubricants were examined overall and with what evaluations? How do similar components of a machine type look when compared with each other e.g. with different service lives? And what is the volume of the oil charges?

Get going on www.LAB.REPORT

An overview of the most important functions

NEW	**Submitting new sample** Form for submitting a new sample opens. Have the laboratory number from the printed sample form ready!
	Set up new units Form for setting up a new unit opens.
	Generate QR code A QR code for copying and printing is produced for the selected unit. You will then only need the bar code with the laboratory number. Laminate QR code and attach it to the unit to submit the sample by smartphone.
Data	**Show data sheet** The analysis data of one or several samples for the same machine are shown along with diagnoses and pictures. If several samples are shown, the trend graph is incorporated above the analysis values. If there are more than 12 samples, export the data for greater clarity.
PDF	**Download laboratory report as PDF** Open individual laboratory report or download several reports at once as a zip file.
SIF	**Show sample form** The scanned sample form sent with the sample is shown.
	Forward laboratory report by email An email is generated with the text of the diagnosis of the sample and, if required, your own comment and the laboratory report. It is possible to set your own boilerplate texts and email services.
Export	**Export sample data (CSV, Excel, XML)** Sample data can be exported and saved in different file formats, e.g. for inputting into Excel.
Limit	**Set limit values, define warning and threshold values** Set individual limit values for every single component, such as the gearbox or bearing, or for its lubricant.
	Translate laboratory report Individual laboratory report can be translated into other languages if a standard diagnosis without individual adjustments has been compiled. Some comments in the diagnosis field cannot be translated automatically. If several samples have been ticked, the translated reports are supplied in a zip file.
	Save sample The sample's line is marked yellow. Clicking on , Saved' shows all saved samples.
	Mark specimen as read Clicking on the line marks an unopened sample (bold) as read (unbolded). Same function as when opening the data view or the PDF laboratory report. Samples already opened or yet to be edited can be restored to the unopened state.

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Viva España – the OELCHECK team in Andalucia

Soaking up some sunshine before winter and spending a nice time together!

That's what we all wanted, so we chose Spain as the destination for this year's team trip. On Friday 17 October, 59 colleagues from our OELCHECK team set off for Malaga! Our base for the team weekend was the Club Hotel Aldiana Alcaidesa. It lies at the foot of the Rock of Gibraltar, at the southernmost point of the Iberian Peninsula. Add to this no end of sunshine and the sea on our doorstep!

On Saturday, we were off to the town rally in Gibraltar. The individual teams also had to take the famous cable car to the top of the Rock of Gibraltar and into the realm of the Barbary apes. The only apes living in the wild in Europe played plenty of pranks on us. We were still having a good laugh about it at supper and the presentation ceremony at the hotel.

After relaxing and the rally, Sunday was sports day. Archery, golf, mountain biking or hiking – it was difficult to know which to choose. In the evening, the plane winged its way back to Munich with the OELCHECK team on board, and the following Monday we went back to work with lots of wonderful memories.




The FVA meets at OELCHECK

At the end of September 2014 the scientific advisory board of the FVA met at OELCHECK. The FVA's Powertrain Technology Research Association is a non-profit making association with the purpose of carrying out joint research in the field of powertrain technology. Its members are manufacturing companies from the powertrain technology sector. In addition, well-known research institutes that work with powertrain technology are integrated into the FVA's network.

Almost 100 members took up the invitation to Upper Bavaria. They reported on and discussed the progress of the individual working groups' numerous projects. In the evening, everyone took the rack-and-pinion railway to the top of the nearby Wendelstein, enjoying perfect mountain weather. As the first fog patches formed down in the valley, it was possible to admire a picture-book sunset from the peak.

A visit to the OELCHECK laboratory was scheduled for the following afternoon. Nearly all participants took the opportunity to attend a guided tour through our laboratory for lubricant analysis. The excursion into the world of lubricant chemistry provided a successful end for the mechanical engineers' meeting.

在做什么 NEWS FROM CHINA 在做什么

A technically permitted speed limit of 380 km/h and a drag coefficient that is a full 20% lower than that of the ICE 3 – the China Railways High-speed Train (CRH) is no slouch. The rail network had to be correspondingly upgraded for the innovative multiple-unit trainsets. At 1318 km, the route from Peking to Shanghai is the longest high-speed route in the world.

The 215.3 m-long trains were built by Bombardier Sifang Transportation Ltd. On every CRH, half of all axles are powered by drive assemblies from Voith Turbo. Every powertrain is supplied with up to 40 l of a synthetic high-performance gear oil which is changed every 400,000 km. During this time, it has to deal with a fair number of challenges. The high-speed trains travel long routes and pass through different climate zones in doing so. Tracks are often flooded as well, and this brings with it the threat of water ingress into the oil and the drive assembly. To avoid any possible damage, preventive measures are therefore urgently required.

As a result, the OELCHECK laboratory in China regularly examines the high-speed trains' gear oils before an oil change would be mandated by the maintenance plan. This is the only way to find out whether the gear oil has to be changed earlier or if there might even be the possibility of wear. The values ascertained by the laboratory in Guangzhou are closely scrutinised by our diagnostic engineers in Brannenburg: Will the additives in highly contaminated gear oil hold out? Did the viscosity rise noticeably more than by the 10% permitted? What is the situation with contaminants, such as water for example? Does the PQ index signal magnetisable iron abrasion and therefore wear? Are the values for iron and manganese disproportionately high and thus point to wearing of the rolling bearing cages?

– The OELCHECK diagnostic engineers are aware of their great responsibility and take all criteria into account before they comment on the results of an oil examination. After all, the passengers on a high-speed train want to reach their destination quickly, but also safely.