Spring 2018

OELCHECKER

INSIDER INFO • PARTNER FORUM • TECHNOLOGY FOCUS

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Heidelberger Druckmaschinen – Customers save thousands of litres of gear oil

Efficiency at the touch of a button – Heidelberger Druckmaschinen AG is a market and technology leader in the printing industry.

Heidelberger Druckmaschinen AG has been a reliable and innovative partner for the global printing industry for over 160 years. Reducing spoilage, waste, energy consumption and emissions to a minimum brings commercial success for the leaders in technology and their customers alike. They produce eco-friendly printing products based on the motto: 'business thinking, eco-friendly printing'.

This is the approach across all areas of the company. The **'Oil analysis before maintenance/inspection'** project exemplifies this. In conjunction with the introduction of extended oil change intervals, OELCHECK lubricant analyses have been carried out on hundreds of the company's oil-lubricated sheet offset printing presses since 2015.

The result – oil service life has been significantly extended for 73% of these printing presses! A real boon for customers and the environment.

Oil analysis before maintenance/inspection – the processes are perfectly thought-out:

- around three to four weeks before the upcoming maintenance/inspection of a printing press, Heidelberg's SystemService staff contact the customer. A date is set and the customer is informed that they will be sent an OELCHECK all-inclusive analysis kit in advance.
- OELCHECK is commissioned by the Heidelberg SystemService staff via e-mail to dispatch the appropriate analysis kit to the Heidelberg customer, including a letter, an illustrated guide on proper sampling and a copy of a Sample Information Form, which is mostly already filled in.
- OELCHECK immediately springs into action. The 100 ml sample ottle including all documents stated above, a leak-proof plastic envelope and a UPS returns label makes its way to the customer.
- Now they have everything they need, the customer takes the required oil sample from their

Check-up

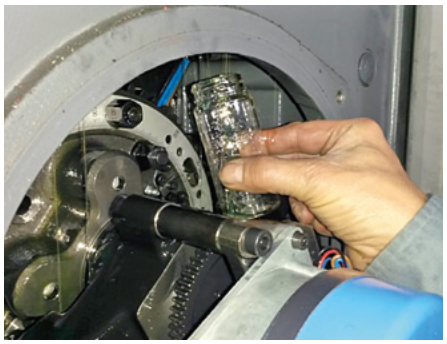
It's no use just being good if the world doesn't hear anything about it. Henry Ford knew this: 'If you want to put a dollar in your company, you need to have another one ready to let people know about it.'

For a growing medium-sized family company, it's particularly important not to get lost among major corporations – particularly when competing for qualified staff. That's why we have now commissioned a recruiting film, as well as an image film, for software developers, diagnostic engineers and scientific lab staff. The Munich film company Spreadfilms is implementing this project for us. We will present you with the result on our web page soon.

In today's digital era, people are not only increasingly looking online for a new employer. They are also spending more and more time on the Internet. Today, a modern Web 2.0 presence is crucial for showcasing your company. Accordingly, OELCHECK is already active on various social media and also has a modern web page and online shop, as well as its own app and web portal. The new videos are intended to help boost our company's appeal and profile.

This allows more potential candidates to hear about the extensive benefits that make OELCHECK stand out as an employer. As well as a cafeteria, a modern gym and many training opportunities, we also offer regular, unforgettable team events. In this edition of OELCHECKER, you can find out more about our last trip, which took us to Lapland. You can also learn more about personnel changes at OELCHECK. And, as ever, we've got news from the world of lubricants and fuels.

Yours, Barbara Weismann



printing press and adds operating hours, oil type, quantity, date and other remarks to the Sample Information Form.

They then send the sample and information form straight to the OELCHECK laboratory in Brannenburg free of charge with UPS.

- The oil analysis is carried out the day the sample is received. The next day, the Heidelberg SystemService staff receive the OELCHECK laboratory report with comments via e-mail.
- Heidelberg SystemService staff check the values detected and the comments from the OELCHECK diagnostic engineer responsible and draw relevant conclusions. The data and observation of a trend allows Heidelberg SystemService technicians to prepare themselves as well as possible for their work with the customer. The latter is informed accordingly of the upcoming measures and how long they will last. The customer can initiate any necessary orders for oil in good time.
- If an oil change is required, the new oil is therefore already available when the Heidelberg SystemService technician visits and can be changed during the maintenance/inspection works.

Business thinking, eco-friendly printing

A CLP 150-type mineral oil-based industrial gear oil is usually used to lubricate printing presses. Depending on the type of press and number of print works, between 50 and 150 litres of gear oil are required.

If the oil was previously usually changed every year in the Heidelberg printing presses, it can now mostly be used for much longer thanks to the oil analyses. The customers' feedback is entirely positive. In some companies, costs for procuring and disposing of lubricants decreased dramatically, as did maintenance outlay. In total, the Heidelberg customers save the environment from several thousand litres of lubricating oil each year with the help of the state-based extended oil change intervals.

The benefits of OELCHECK lubricant analyses

Since Heidelberg had had good experiences in Germany with the lubricant analyses from OELCHECK for many years, and with the 'Oil analysis before maintenance/inspection' project since 2015, the partnership between the companies was also trialled in France and the UK. Following extremely positive feedback from customers, Heidelberg has used the lubricant analyses carried out at OELCHECK in Germany since 2016 across the board in all machine types with circulating oil lubrication.

Accordingly, Heidelberg business units operating abroad now also enjoy the benefits of OELCHECK lubricant analyses:

- Consistently high quality of analyses
- Clearly defined processes and analysis methods with globally uniform limits and warning values
- Well-thought-out and practical analysis kits for sampling and dispatch
- Collecting and returning samples with UPS
- Uniform Sample Information Forms
- Targeted diagnoses by OELCHECK engineers for measures during maintenance such as an oil change

Thanks to the 'Oil analysis before maintenance/inspection' project and the partnership with OELCHECK, Heidelberg has been able to improve the service it offers its customers significantly!

Heidelberger Druckmaschinen
Efficiency at the touch of a button

Heidelberger Druckmaschinen AG is a market and technology leader in the printing industry, known for its sheet offset printing presses and solutions for the print media and packaging industry. User-friendly systems, custom products and innovative services ensure the highest degree of product quality, streamline the management of complex processes and help to avoid errors – throughout the production chain. The result: efficiency at the touch of a button. A total of around 11,500 staff, together with sales partners at 250 locations in 170 countries worldwide, ensure customers' wishes are implemented and constant development on the market. In the financial year 2016/2017, group sales were an impressive €2.5 billion.

For further information: www.heidelberg.com

OELCHECK continues to expand

As sample numbers are constantly rising, we have bolstered the staff in many of our departments to be able to continue complying with our quality principles in future.

In order to ensure the data from Sample Information Forms makes it into our software even more quickly and the lab can access the required data as quickly as possible, we have hired two additional members of staff in **Data Entry**.

Our Head of Scientific Research is now assisted by three **scientific team assistants**. The lab teams have also been expanded with the addition of three **laboratory technicians**.
The **diagnostics team** is also welcoming the addition of three new staff well-versed in all things oil.

Their extensive experience and expertise will help us continue to comply with our planned schedule for the production of lab reports.
In **Sales**, we are hiring a back office manager and an additional back office assistant. This is because the back office will be taking on additional duties in future, such as customer service for our app and web portal.
A management change has taken place in **Service and Sales**. The new Head of Service and Sales is **Stefan Mitterer**. He has already been with OELCHECK for over nine years and has experience as a diagnostic engineer and Head of Technical Service. Most recently, he was a Key Account Manager responsible for consultancy and support for key clients in our company.

The previous head of department, Steffen Bots, is going freelance. As such, he will remain associated with OELCHECK. He will help support the growth of the company outside of Europe.

The OELCHECK team goes north

Virtually our entire staff took part in our three-day team trip to Lapland.

On Friday 19 January 2018, we set off bright and early to Salzburg Airport. We then flew north to Kuusamo, Finland, where the transfer buses were waiting to take us the 100-kilometre journey to the holiday resort of Iso-Syöte.
As soon as we arrived, we began our first tour – kitted out in thermal wear – through the icy and enchanting winter wonderland.

On Saturday, a 45-kilometre wilderness snowmobile safari took us through snowy forests and across frozen lakes at -16°C. Along the way, we enjoyed coffee, tea and pulla (cinnamon rolls) at a campfire and frolicked together in the snow.

In the Northern Lights safari that followed, we turned our gazes in the dark of night towards the star-filled sky.

We then snuggled up with the little four-legged apprentices in their 'nursery' and warmed ourselves by the fire while we listened to the tales of the shamans.
After having dinner together and reflecting on our eventful day, we put on our dancing shoes and partied until well beyond midnight.

Some tramped up to the top of the fjell in their snowshoes, enjoying a stunning view and a sunset at the top, while the rest of us took a kickspark, a popular Scandinavian kicksled, down the fjell. After dinner, we learned how to ride snowmobiles.

We crossed snowy pistes in snowmobiles in teams of two first of all, then we relied solely on the strength of six 'dogpower' on a 12-kilometre husky safari, with one person sitting on the sledge and the other standing on the runners to steer. The snowy winter wonderland rolled by, and the perfect silence was broken only now and then by the dogs' barking.

The next morning, we enjoyed a hearty brunch before making our way back home to Brannenburg with a heavy heart.

Engine oils for vehicles – Current trends and oil analysis

Trend 1
Reduction in emissions

The current Euro VI exhaust emissions standard reduced the limits for diesel engines in commercial vehicles and buses by around 67% for particles and as much as 80% for nitrogen oxides in comparison to Euro V. The European Parliament has agreed a maximum limit of 95 grams of carbon dioxide (CO_2) per kilometre for all new cars from 2021. 95% of vehicles must meet this condition by 2020.

The bar is set high for reduction of emissions. However, the reduced exhaust emissions can only be achieved with engine oils designed for the task. Yet if engine oils designed for a lower performance level are used, it is often not possible to comply with exhaust emission limits. During combustion, an unsuitable engine oil can also produce too many fine particles which build up in the pores of the diesel particle filters and dramatically reduce their service life. Deposits can also form on the piston head or the valves, which can impair the optimum combustion process, for example through 'knocking', and cause damage to the engine.

The exhaust emissions provisions are reflected in the maximum permitted levels of ash-forming substances in the engine oils, for example. Depending on the amount of sulphated ash detected in the lab, which essentially depends on the levels of the additives phosphorus and sulphur, the engine oils are known as low, medium or high SAPS oils (SAPS = sulphated ash, phosphorus, sulphur). In fixed petrol engines, for example, there are even 'ash-free' engine oils in use.

While generous amounts of sulphur and phosphorus used to be added to the oils to protect against oxidation and wear, these are now reduced to a minimum. In order to meet today's requirements for low SAPS oils, such as longer oil change intervals, less friction and good protection against wear, brand new additive packages were developed and optimum base oils were selected for these.

Trend 2 Lowering consumption of fuels and lubricants

The engines should run in a way that saves on fuel and oil – engine oils are also in demand here. A significant criterion in this regard is the base oils' evaporation loss caused by factors such as structure-related high temperatures at the piston rings and the underside of the piston. Yet the quantity of the engine oil that evaporates on contact with the components also depends on this itself. Factors such as the type of base oil, its viscosity and the additive package play a role. An engine oil with a high level of highly volatile molecules tends to thicken. This leads not only to a deterioration in its multi-purpose characteristics and low temperature properties. The cylinder and oil scraper rings are less adept at scraping oil with a highly viscous lubricant film from the cylinder wall. Accordingly, more engine oil combusts with the fuel – increasing engine oil consumption. A thicker oil also loses some of its low-friction properties and therefore contributes to increased fuel consumption.

The lower an oil's evaporation loss, the more stable its viscosity properties. The consumption of fuel and oil is therefore all the lower. The evaporation loss detected using the Noack test in 60 minutes at 250°C is limited in the current ACEA specifications E6, E7 and E9 to a value of ≤ 13% for engine oils for heavy commercial vehicles, for example, whereby the figures are far lower for very good oils.

Trend 3
Thinner and thinner

Engine oils in SAE classes 0W20 and 0W30 for cars or 5W30 for commercial vehicles are not uncommon today. Even engine oils in viscosity classes SAE 0W16 and 0W12 are already available. For hybrid vehicles, there is even an oil with viscosity class 0W8 on the market. And the trend is moving towards even 'thinner' oils.

In principle, every engine runs more smoothly and economically with a less viscous engine oil. Yet the thinner the oil, the harder it is to build a hydrodynamic, stable oil film which prevents mechanical contact between the moving parts as much as possible and protects their surfaces from wear.

In this context, the engine oil's HTHS viscosity plays a role. HTHS, 'high temperature high shear', indicates the dynamic viscosity that is measured under the influence of high shear forces at 150°C in millipascal-seconds (mPa-s). Lowering the HTHS viscosity should lead to a reduction in power dissipation and thus to fuel savings due to low 'inner friction' of the oil. If the HTHS viscosity is reduced too greatly and the oil film becomes too thin, however, the resistance to wear is at risk.

Setting lower limits for HTHS should ensure that engine oils themselves guarantee the necessary lubricating safety in big end bearings with their large shear forces and high oil temperatures.

In order to further level the surface asperities of paired metal surfaces and therefore to form a continuous lubricating film more easily, additional

friction-reducing additives, e.g. on a molybdenum-organic basis, are added to some oils. These additives are often used in racing engine oils to reduce wear.

Conclusion: Creating efficient engine oils with low HTHS viscosity, a high viscosity index, low evaporation loss and outstanding protection against wear is a total balancing act. Examining and selecting suitable oils is only possible with the help of a range of oil analyses.

Trend 4 Hybrid vehicles and electric drives

Hybrid vehicles – e-drive coupled with combustion engine

Hybrid vehicles are propelled with the help of an e-drive, whose battery is recharged where required by a combustion engine, usually running on petrol. This allows the engine to almost always be operated at approx. 2,500 revolutions in the optimum efficiency range of over 35%, while in conventional operation, no more than 20% is achieved. Traditional engine oils were originally used in these engine designs. Special oils are now increasingly used for hybrid engines. As hybrid engines usually run in a relatively narrow speed range and are subject to the same strain, oils with lower viscosity classes SAE 0W8 to 0W20 are used. With the help of the battery, the oil is preheated in such a way that there is almost no cold start. Yet in a frequent interval operation such as in urban traffic and operation at a nearly constant speed, these engine oils change in different ways to their classic equivalents.

However, there are as yet no results from long-term tests with these engine oils from hybrid vehicles. That is why regular monitoring of the engine oil to determine the optimum oil change interval combined with an assessment of the systems' durability is definitely recommended.

Vehicles with electric-only drive

Electric vehicles whose batteries are supplied with new power at charging stations also require lubricants, but no engine oils. For the drive gears downstream from the e-engine, the use of a gear or transformer oil is still required. The power steering and usually also the vehicle suspension are powered by servo or multi-purpose hydraulic oil. Either the transformer oil or a coolant containing water are used to cool the battery cells.

However, these products differ from the products for vehicles with combustion engines in major aspects.

Oil analysis
with a variety of new duties

Conclusions on state-specific oil change intervals, detecting causes of damage and preventing damage and wear – lubricant analysis is also crucial in the automotive industry. However, in addition to these traditional duties, it is also constantly acquiring new ones. These are as varied as the developments in the area of engine oils, which are getting thinner and thinner and yet must remain resistant to wear. Neither custom-made lubricants for hybrid engines or electric vehicles nor energy-saving, low-viscosity engine oils for classic combustion engines can be developed without observation through oil analyses. When developing new engines, the aims are to lower exhaust emissions and reduce consumption of fuel and lubricants. When using the engine oils developed for this purpose, oil analysis is a crucial monitoring tool in practice, particularly in long-term use, for finding out more about lubricants and the engines lubricated with them.

All in all, lubricant analysis is playing an increasingly important role in light of raised awareness of the environment. We at OELCHECK are perfectly prepared for this.

Coolant analyses uncover damage in cooling systems

It's not just oil that can talk. Coolant can too. And at OELCHECK, we understand its message.
Coolant analysis has only recently been 'booming', as machinery manufacturers and operators have increasingly recognised the potential that they can tap into through regular coolant analyses.

Just like lubricants, the mostly water-based coolants' properties also change through ageing and pollution. Ready-mixed coolants or water to which special concentrates have been added have a range of duties: they ensure optimum heat supply and extraction, protect against corrosion, cavitation and deposits and prevent freezing at sub-zero temperatures. They are used for cooling engines in vehicles, construction machinery, locomotives and petrol engines, but also for cooling electric drives in wind turbines or new e-vehicle drives. In order to ensure operability over a long period of time and therefore the safe operation of the cooled units, OELCHECK investigates all important parameters.

And success proves us right!

We now analyse over 500 coolant samples each month and have built a lab team specialising in the analysis of water-based coolant fluids due to the rising demand. As well as a variety of devices for water analysis, another ion chromatography (IC) has been put into operation alongside the existing one. The 5,000 coolants and counting analysed so far show that OELCHECK has had a good nose for new coolant analyses from the outset.

The number of people who took part in our partner OilDoc's coolant symposium, which took place on 14 and 15 March 2018 in Brannenburg, also indicates the growing interest. As well as fascinating presentations by manufacturers and consumers, Dr Thomas Fischer, Scientific Director at OELCHECK, presented various coolant analysis procedures. And our coolant expert Matthias Aßmann then explained how he, as a mechanical engineer, produces a diagnosis regarding the state of the coolant and any problems in the cooling system based on the analysed values.

During a tour through the OELCHECK laboratory focusing on the main points of coolant analysis, the participants gained many interesting insights and additional knowledge and food for thought.

Coolant analysis

OELCHECK's coolant analyses cover the following areas:

- **Coolant state, ageing**
  During ageing and oxidation, decomposition products with acidic properties are produced in the coolant, which can be detected in the form of acetate, formate, glycolate and oxalate.
- **Water quality**
  In terms of water quality, the focus is mostly on water hardness and the level of chlorine- and sulphur-containing compounds or a generally unsuitable water.
- **Decomposition products, additive modifications**
  Additives that help the coolant perform its various duties decompose over time. Additive concentration therefore allows conclusions to be drawn on the coolant's suitability for use going forward.
- **Contaminants**
  Contaminants may be detected in the form of dust, for example, a combination of coolants or metal elements which are disseminated from the components built into the system and thereby provide indications on improved upkeep.

The analysis kits

Just like for lubricant analyses, OELCHECK offers a variety of prepaid coolant kits with a predefined scope of analysis. But what conclusions can be drawn from it?

Quality control and a comparison of fresh products is usually done on the basis of a **'premium analysis'**.

With the **'advanced'** kit, coolant ageing or a mixture with another type of coolant can be detected. However, the same kit can also be used to draw conclusions on unsuitable base water or metallic contaminants.

A conclusion can be drawn on whether corrosion processes have already begun in the cooling system using the analysis kit 2, **'basic'**, in the form of an element analysis.

If the reason for changes must be unambiguously clarified, then OELCHECK recommends carrying out an ion chromatography.

The diagnosis – Lab values enhanced by information on damage

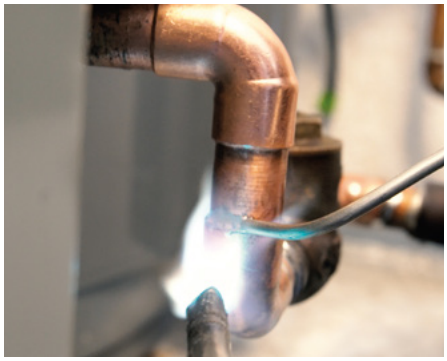
The interpretation and diagnosis of analysis results is often not clear, unlike the measurement of individual values. It is therefore absolutely crucial for the engineer who produces the diagnosis that they also receive basic information, such as on the place and time of use, in the form of a completed sample information form, alongside the many lab values.

Without this basic knowledge, in many cases, it is not possible for the OELCHECK engineer who interprets the lab values for the end consumer, despite their experience and a comparison with the values saved in our database from many coolant analyses, to give a helpful recommendation on action to be taken.

A coolant analysis can, just like an oil analysis, point to advanced ageing (glycol decomposition products) or cavitation and corrosion damage (aluminium from aluminium components).
Two typical examples from the field of coolant analysis make this clear.

Example 1: Analysis of base or heating water

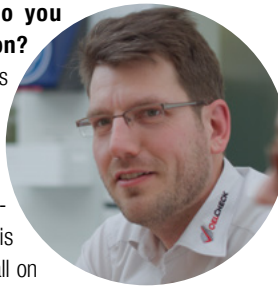
A special feature in the field of coolant analysis is the analysis of as yet unmixed, unadditivised base water or heating water. The evaluation of analysis values mostly takes place based on the specifications of the manufacturer of engines or coolant concentrates. For water intended for use in heating (not cooling), further guidelines (e.g. VDI 2035) may be used as a basis. In the analysis of base water, the chloride and sulphate content is very important, as well as the pH value and water hardness, as chlorides and sulphates can favour corrosion and reduce the efficacy of corrosion inhibitors.



Example 2: Contamination due to fluxes

Flux is mostly used in the form of soldering fluid when soldering coolers and pipes in order to achieve improved wetting of surfaces through the solder. They remove oxide layers and reduce the surface tension by means of a chemical reaction. This achieves an improved soldering result. The mostly acidic fluxes react aggressively and can cause corrosion at the soldering point if they are not removed. A concentration of flux residue that is too high is now either uncovered by sampling the cooling water, or it can become apparent through leakages in industrial cooling circuits. Some flux components hardly dissolve in water. As a result, only traces of these can be found in coolant samples. Whether they are at all present in cooling water is shown by the analysis values in the form of a reduced pH value and an increased level of glycol decomposition products. Increased potassium values and decomposed anti-corrosive additives are also notable. The latter is then also visible through metal components which indicate increased corrosive wear. Due to the poor solubility of fluxes in cooling water, any such contamination cannot be eliminated, even with several coolant changes. Expensive corrosion damage can then only be avoided here with the help of regular analyses.

The spectrum of questions with regard to coolants is very broad and depends on a great deal of information. Do you have a specific question?



Our coolant expert Matthias Aßmann will be happy to explain to you whether your question can be answered with an OELCHECK analysis and which analysis kit is most suitable. Give him a call on +49 8034-9047-210.

New and improved bottles!

The 100 ml plastic sample bottle in our all-inclusive analysis kits has had a facelift.
At first glance they look the same as ever, as the only difference is we now use two threads for screwing on the lid rather than just one. However, this secures them even further against leakage. The lid is slightly taller due to the additional thread and impresses with more functional handling.
The new bottles are supplied with the lid already screwed on. The bottle and lid therefore have a common, transparent packaging which continues to prevent foreign particles from contaminating the sample or the bottle.
The individual all-inclusive analysis kits are being gradually switched to the new bottles. As we will use up our existing stocks first, you may receive bottles of different types for various kits. As the previous lids seal the new bottles and the new lids seal the old bottles securely, you can continue to use the previous bottles and lids as usual. The new design of our sample bottles is the result of customer recommendations. This is because we set a great deal of store by making our customers enthusiastic about oil analyses through simple accessories for sampling and good advice, rapid and precise lab analysis and pertinent diagnoses.
However, the following also applies to the improved bottles:
Your sample is only securely protected against leakage when it's screwed properly.

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info@oelcheck.de · www.oelcheck.de

Concept and text:
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Q & A

The lab reports of the semi-annual trend analyses of circulation oil from a steam turbine were always marked OK with a green tick. However, in the last lab report we received an urgent recommendation to conduct an MPC test or change the oil. What is behind the MPC test?

OELCHECK:

A high degree of efficacy, short start-up periods and flexibility under changing operating conditions – today, turbines must meet a variety of requirements. Increasingly, they depend on their turbine oils to operate safely.
These must cope with:

- very long oil change intervals
- increased oil circulation temperatures
- more compact oil circulation system structures with shorter circulation times.

Although the standard specifications for turbine oils are constantly being tightened, they often do not sufficiently cover individual strain scenarios. Accordingly, the focus is increasingly on practical performance tests as a prerequisite for the recommending of oils by the OEM.

The long-term use of turbine oils is influenced by several factors.

- **Oxidation:** accelerated by the oil's reaction with atmospheric oxygen in connection with increased oil circulation temperatures of over 60°C
- **Thermal disintegration of base oil and additive package:** through localised extreme temperatures during electrostatic discharges or local spontaneous combustion of compressed, undissolved air bubbles
- **Contaminants:** water, dust, wear particles and mixtures with other oils.

There are various consequences for the turbine oil: significant consumption of antioxidants, potential filtering of anti-foaming additives, deterioration of air output behaviour, decomposition of the wear protection package, reaction products in the form of undissolved oil components, deposits (sludge), varnish formation, dark colouration and/or oil turbidity.

As well as the deterioration of lubricant performance, the deposits constitute a risk for the system above all. The solubility of the additives in the base oil play a key role in their formation. Today, the manufacturers of turbine oils are increasingly using base oils in groups II (hydrotreated), III (hydrocrack) and IV PAO (poly-alpha olefins). These oil types boast an improved relationship between viscosity and temperature and are more stable in the face of oil ageing and oxidation, for instance. Yet decomposed additive components and reaction products of base oil are less easily dissolved by these base oils. The ageing products can deposit more as a result. They also have a high polarity and mostly form deposits on metallic components, such as slide bearings, oil coolers, tanks or gears. In addition, ageing products form increasingly large molecules. They 'agglomerate', stay in filters and/or valves in greater numbers and can block them.
During cooling, such as during downtime as a result of a turbine inspection, the oil is even less soluble. The process of precipitation and deposits in the system is thereby reinforced. Soft **sludge** and/or **varnish is produced as a result**. Calm areas with very low oil circulation and/or flow velocity are under particular strain. While sludge can still be wiped away, varnish often cannot be removed, even with solvents. It constitutes a massive risk to the system. Oil pipes and bores can become clogged, valves and filters can be blocked, sealing problems can occur. The oil circulation quantity reduced as a result affects the lubrication of bearings, the function of oil coolers and heat exchangers.

Oil monitoring is more important than ever before

Oils are still supposed to reach lifespans of several years, despite an annual 8,500 hours of strain, particularly in large oil circulation systems with capacities well over 1,000 litres. Due to increasingly demanding operating conditions, turbine oils are being developed, but how they prove themselves only becomes clear in practice. Regular monitoring with oil analyses is therefore crucial. However, modern turbine oils also require constant adjustment of the values detected in lubricant analyses.
OELCHECK offers **10 different all-inclusive analysis kits** for turbine oils alone. The scope of your analysis is perfectly adapted for a wide range of turbine oils and operating conditions. In the analysis, oxidation, modification of additives, any wear or contaminants in the fine and/or finest range are the focus, among others.
The values detected are assessed by the OELCHECK diagnostic engineers as parts of a whole. If formation of sludge and/or varnish is suspected, an additional **MPC test** (Membrane Patch Colorimetry) is recommended.
The MPC value is included as standard in analysis kit 10 (standard for turbine inspection). It is the only procedure worldwide that can be used to quantify an oil's potential to form varnish. The higher the MPC index is, the more undissolved particles are present in the oil.

A practical tip: turbine oils should be monitored through oil analyses every 2,500 to 4,000 operating hours. This is the only way to guarantee maximum operating safety. However, if unusual temperatures, shortened filter lifespans and/or discolourations of the oil nevertheless occur during operation, these are often the first indicators that deposits or even varnish are being formed. In that case, only an immediate analysis of the turbine oil including an MPC test will provide certainty. If the suspicion is confirmed, OELCHECK diagnostic engineers will advise on concrete measures or even an oil change.

**OELCHECK is ready to answer any questions you may have about tribology or lubricant analysis.
Contact us by e-mail (info@oelcheck.de) or by fax (+49 8034/9047-47).**