



OELCHECKER

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CONTENTS

- ✓ Proximity to the customer leads to success
Our Customer Service & Sales Department is expanding p. 3
- ✓ News from China – Sinopec optimises service with oil analyses p. 3
- ✓ **Hot topics:**
OELCHECK analysis kits for coolants and anti-freeze agents
– The decisive investigative parameters
– Five new, all-inclusive analysis kits p. 4-5
- ✓ Classic Cars by Tom Fischer p. 6
- ✓ New for gas engines – a kit that can do it all p. 7
- ✓ Q&A – lubricating grease analyses, parameters and practical uses p. 8



SEW-EURODRIVE: International cooperation with OELCHECK

Service from the start

From choosing individual gear motors to achieving a system solution, the SEW-EURODRIVE experts are there for their customers. In addition, energy-efficient concepts and solutions contribute to a significant fall in energy costs. From commissioning, the 24-hour service hotline and complete maintenance management to conversion and modernisation measures, SEW-EURODRIVE offers all services to achieve the highest possible system availability and ensure this in the long term. The Condition Monitoring Service is based on a systematic recording of the entire drive technology and automation. In so doing, a comprehensive concept is drawn up and implemented, from initial consultancy and explaining the optimal analysis methods to installation and analyses. In the first instance, defined parameters are measured, interpreted, visualised and forwarded to the system operator's maintenance system. OELCHECK lubricating grease analyses complement SEW-EURODRIVE's Condition Monitoring Service perfectly with engineering analyses, a visual representation of the results as well as the option of calling up data anywhere in the world online using the customer portal www.lab.report and integrating it into the company-wide system.



Sample from an SEW-EURODRIVE large gear.
OELCHECK oil analyses are the perfect complement to SEW-EURODRIVE's Condition Monitoring Service.

Countless conveyor belts, systems in heavy industry, beverage filling lines, gravel plants, baggage carousels in airports and much more besides would be brought to a standstill without gears and gear motors as well as SEW-EURODRIVE's related automation technology. It's not without reason, therefore, that the German company's slogan is *Driving the World*. With over 16,000 employees worldwide, SEW-EURODRIVE's

drive and automation solutions ensure application-specific customer advice and a wide-ranging service portfolio. In the area of Condition Monitoring Service, oil analyses are an important component. After good experiences with OELCHECK in Germany, SEW-EURODRIVE is to start working with the leading laboratory for lubricating grease analyses on an international level.

Check-up

The world is not standing still, and our sector is also constantly on the move. That's why OELCHECK continuously responds to new developments and customer requirements.

If we want to continue to be among the best, continuous development is essential. Not only do you need well-equipped laboratories and office space, but you also need qualified staff who can apply their knowledge and contribute to the success of the business. That is why we have again planned a wide range of training courses for our employees in 2017. Alongside technical and lab training sessions, during which our staff can learn about lab devices as well as issues surrounding operational and lubricating greases, employees receive telephone skills courses, English lessons and software training sessions in Outlook to further optimise our time management. In addition, our managers will receive individual training sessions in order to improve internal communication. Furthermore, they will attend a workshop this year with executive management. We also call on the expertise of OilDoc consultants on a regular basis.

Further training concerning Machinery Lubrication Analyst II (MLA II) certification is currently underway for our staff. In addition, some employees will also take the Certified Lubrication Specialist (CLS) exam this year. Various training sessions were also held at the start of the year for newly introduced coolant analyses, which we will discuss later on in this issue. As a result, we are not only focusing on expertise, but also on expanding essential key skills from which our customers can also benefit directly.

As Benjamin Franklin once said, an investment in knowledge pays the best interest. By training our employees, we are not only improving our service, but we are also investing in our company's future.



Yours, Barbara Weismann



Forward-thinking maintenance

Avoiding unplanned production downtimes by recognising wear early on (predictive maintenance) is high on SEW-EURODRIVE's and system operators' priority lists. A simple and cost-effective option for supporting this maintenance strategy is the regular analysis of the lubricant used. Downtimes resulting from wear can usually be traced back to a lack of lubrication or oil changes. If, for example, combinations of metal particles are found in an oil sample, OELCHECK diagnostic engineers can draw conclusions as to their origin and usually assign the wearing processes to individual components. In addition they are able to determine whether it concerns corrosive or abrasive wear.

Yet it is not just potential damage that can be spotted early with lubricating grease analyses – SEW-EURODRIVE customers benefit from the longest and most condition-based oil change intervals, as the best time for a change can be determined using the analysis results. This allows you to plan maintenance work at the right time and save on costs.

One partner, many benefits

Given that SEW-EURODRIVE has had good things to say about OELCHECK lubricating grease analyses for several years, the companies' partnership is soon to be expanded internationally, allowing SEW-EURODRIVE's international subsidiaries to benefit from numerous advantages:

- Uniform high quality of analyses and diagnostics
- Clearly defined processes and analysis methods
- Uniform sample information forms and lab reports
- Specific recommendations from an OELCHECK diagnostic engineer regarding further necessary measures, such as oil changes, oil filtering or an endoscopy
- Well-thought-out and practical analysis kits for sampling and dispatch
- Free collection and return of samples throughout Europe with UPS
- Access to the customer portal www.lab.report, where samples can be entered online anywhere and at any time, data managed and other projects such as translations into other languages monitored
- Significantly improved service offering for SEW-EURODRIVE customers

Green light following a successful test

The partnership with OELCHECK, along with the associated processes, was tested during a pilot project with SEW-EURODRIVE Netherlands. The result – on the advice of SEW-EURODRIVE, the system operators in the Netherlands are now increasingly using oil analyses. Customers appreciate the added value of OELCHECK analyses, which display the current situation of oil and gears perfectly. Particularly if oil samples are taken and analysed regularly and then lead to forward-thinking maintenance trends and wear processes being recognised early. Following the successful test in the Netherlands and the years of positive experiences in Germany, more and more SEW-EURODRIVE subsidiaries are now using OELCHECK lubricating grease analyses. The comprehensive plan will be presented to a large international audience at the Hannover Messe 2017.

SEW-EURODRIVE Tradition in motion

When the company Süddeutsche Elektromotorenwerke, or SEW, was founded in Bruchsal, north Baden-Württemberg in 1931, no one could predict the rapid development it would experience. Today, SEW-EURODRIVE GmbH & Co KG has a network of 15 manufacturing plants and 77 drive technology centres in 51 countries around the world. Headquartered in Bruchsal, the family-owned business employs more than 16,000 staff worldwide, 550 of whom work in research and development. With a turnover of €2.8 billion in 2016/17, SEW-EURODRIVE GmbH & Co KG is among the international market leaders in the area of drive technology and automation.

More information: www.sew-eurodrive.de

Proximity to the customer leads to success

Our Service & Sales Department is expanding

Are you interested in working at OELCHECK?

We are looking for people to join various departments. Our current vacancies can be found online at www.oelcheck.de/en.

Contact with and proximity to the customers is becoming increasingly important for us. That's why, last year, we started hiring sales representatives who can provide you with that personal touch on site as well as advice according to your needs. Our Customer Service & Sales Department has also seen further expansion in recent months, allowing us to improve our telephone support and customer service.

From April, **Steffen Bots**, Director Service & Sales and who has been at OELCHECK for over a decade, will be supported by **Stefan Mitterer** as Key Account Manager. After working in automotive development for a German car manufacturer, Stefan worked at OELCHECK as a diagnostic engineer before heading up the technical customer service department. His various roles mean he not only has well-founded expertise, but also has extensive knowledge of the analysis services offered and working processes in place at OELCHECK.

Johannes Ruf has been the sales representative for the western Germany region since December. Over 20 years of experience in the lubricating grease industry across several lubricant manu-

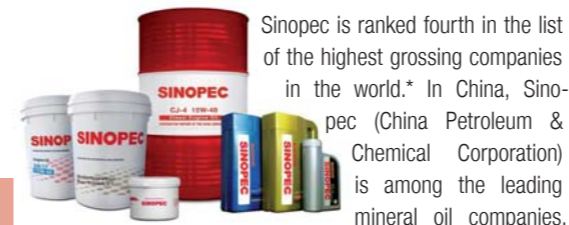


facturers has allowed Johannes to gain a comprehensive overview of the industry and know what matters for customers in different sectors when it comes to analyses. **Stefan Dolp** has been responsible for looking after customers and prospects in southern Germany, Austria and Switzerland since the middle of last year, having spent several years in lubricating grease sales.

Markus Schütz and **Marcel Giehl** have been fielding telephone and written requests from OELCHECK customers as part of the Service & Sales team for some time now. They were joined by assistant **Nicole Herm** at the start of the year. A banker by trade, what she lacks in experience in our sector, she makes up for having held various assistant positions in several industries.

在做什么 NEWS FROM CHINA 在做什么

Sinopec – leading Chinese mineral oil company optimises its service with OELCHECK oil analyses



Sinopec is ranked fourth in the list of the highest grossing companies in the world.* In China, Sinopec (China Petroleum & Chemical Corporation) is among the leading mineral oil companies, operates the largest petrol station network in the country and is omnipresent. The company opens natural gas and natural oil deposits worldwide, owns refineries and manufactures a whole range of lubricants. In addition, rapidly biodegradable products and high-performance lubricants for a variety of applications form part of the range. Sinopec lubricants ensure the reliable operation of China Railways' high-speed trains, among others, which in normal operation run up to 350 km/h faster than all other trains. The company is present in more than 50 countries, above all in South-East Asia, Australia and New Zealand.

Sinopec sets great store by excellent lubricant quality. In addition, the Chinese company focuses on product properties, such as longer service lives and higher energy efficiency, that offer customers real added value. Service is also one area that the company believes to be particularly significant, evidenced by the fact that the lubricant specialist operates the largest customer service centre in Asia. Furthermore, Sinopec is now expanding its service provision to include another significant factor. As the first Chinese lubricant manufacturer, the company offers its customers in industry the option of monitoring oils and grease through OELCHECK lubricating grease analyses. This is a logical step, as OELCHECK's more than 25 years of experience is particularly useful when it comes to the long-term use of lubricants. Although Sinopec generates analysis reports in its own service laboratory, selected customers can now benefit from the speed of a lab based in China coupled with the expertise of German diagnostics engineers.

So that Sinopec customers will be able to enter and manage around 10,000 samples a year even quicker and control their own sales campaigns, they will soon have all the features of OELCHECK's customer portal, www.lab.report, available to them. Alongside oil analyses, Sinopec places increasing value on well-founded education and continuous training of sales representatives and technical advisers. That is why in the second half of 2017, OilDoc will run a training week for 50 Sinopec employees, which will culminate in an ICML (International Council for Machinery Lubrication) exam allowing them to put their knowledge to the test. In Europe, however, few people have heard of Sinopec. Yet this could change in the coming years, as a committed Chinese team has one ambitious goal – building a world-trusted lubricant brand!

* Ranking: <http://beta.fortune.com/global500/>

New: OELCHECK analysis kits for coolant and anti-freeze agents

As a leading laboratory, we analyse the quality of lubricants in Europe and the Far East and generate accurate diagnoses. As the first laboratory in Germany to research coolant and anti-freeze agents, we are now offering our customers another completely new service. Aqueous coolants are essential for the safe operation of engines and many other systems. It is not without reason that leading engine manufacturers have drawn up detailed specifications for coolants and engine coolants. The regular checking of these agents is becoming increasingly important, and with the new OELCHECK analyses, everyone is on the safe side!



For researching coolants and anti-freeze agents, we have installed a water laboratory within our lubricant laboratory.

From now on, OELCHECK is also studying glycol-based coolant mixes and concentrates, frost and corrosion protection as well as heating and preparation water. To analyse these media, we have invested in additional test devices and installed our own water laboratory within our lubricant laboratory. Most devices used for water analyses are in fact also used for oil analyses, yet measuring methods and calibration are entirely different in this regard. Just as for oils, we have compiled special OELCHECK analysis kits for checking coolant and anti-freeze agents with which almost all practical-related questions can be covered.

Modern coolant concentrates are mostly based on ethylene glycol and are free from nitrates, amino acids and phosphates. They contain a cocktail of special additives, with which they reliably suppress cavitation and are able to achieve the required long service life. In addition, they must be compatible with the up to 100 materials which can be built into a coolant system. Coolants ensure optimal heat supply and dissipation, protect against corrosion and cavitation as well as deposits and reduce freezing at sub-zero temperatures, and are used in motor vehicles, construction machinery and locomotives as well as in wind turbines and stationary diesel, natural gas and special gas engines. 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.

Coolant state

At the start of every analysis, a visual evaluation of a sample takes place. Upon first inspection – which according to their specification is usually a red, blue or green coolant – there are often signs pointing towards some contaminants, such as from dust or another coolant.

The next step involves a refractometer and oscillating U-tube, which determine the refractive index as well as the density, both of which are measurements for the ratio of water and concentrate in the sample. If the normal mixture ratio of 1:1 is incorrect, frost protection can no longer be guaranteed. The pH value measures the acidity. Given that deionised water is mostly prescribed for coolants, pH-neutral water with a pH value of 7 is used as a rule. However, the coolant becomes slightly alkaline through the additives used in the concentrate. This reaction is desired so that the metals in the cooling system are protected against acidic attacks. Yet over time, the additives break down. If the pH value falls below 7, the water will become acidic and the cooling system may corrode. Measuring the pH value in the laboratory is therefore extremely important, as it determines whether the coolant still provides sufficient surface protection.

If the conductivity of the coolant shows an increase in ions during the examination, it can be assumed that no deionised water was used during preparation. This is free from ions and therefore only minimally conductive.

Water quality

When assessing the water quality, everything revolves around the water hardness, hardeners and corrosion-inducing substances. The total water hardness is determined based on its calcium and magnesium ion content (hardeners or calcifiers). The higher the limescale content, the harder the water. The hardness is determined in German hardness degrees, or °dH. The preparation water must be softened, or otherwise softened in advance. If this is not the case, particularly when dealing with high temperatures, limescale deposits can build up which reduce heat dissipation or even block the cooling system. OELCHECK determines not only the water hardness and the magnesium and calcium content, but also checks the water for chlorides and sulphates. Compounds containing chlorine and sulphur should not be present in coolants as they can encourage corrosion or cause deposits.

Top tip: As water quality plays an extremely important role, OELCHECK also analyses preparation water before use. Have a sample of this water analysed before mixing it with the coolant concentrate. It should only be used as preparation water once the OELCHECK laboratory has given the green light to do so.

Decomposition products

Much like oils, ethylene glycol and additives in a coolant break down during its period of use. Increased temperatures and air intake accelerate this process. Coolants oxidise, whereby acids form. Compounds such as acetates, formates, glycolates and/or oxalates are then documented in the sample.

Contaminants

Even when the coolant contains contaminants, deposits can form in the circuits. With a reduced or even a blocked flow, effective cooling is no longer possible. Attention should be paid to cleanliness and the high quality of the preparation water when

Category	Testing method	Test result	KIT	Basic 1	Basic 2	Advanced	Premium
Coolant condition	Visual evaluation	Appearance, colour, contaminants		✓	✓	✓	✓
	Refractometer	Refractive index, glycol concentration ¹⁾ , freezing point ¹⁾		✓	✓	✓	✓
	U-tube oscillator	Density		✓	✓	✓	✓
	pH-meter	pH value		✓	✓	✓	✓
Water quality	Conductometer	Conductivity		✓	✓	✓	✓
	ICP	Water hardness ²⁾ , Total alkaline earth metals ²⁾ , Calcium, Magnesium			✓	✓	✓
	IC	Chloride, Sulfate				✓	✓
Decomposition products	IC	Acetate, Formate, Glycolate, Oxalate				✓	✓
Contaminants	ICP	Aluminium, Lead, Chrome, Iron, Copper, Nickel, Zinc, Tin, Lithium, Manganese, Silver, Titanium, Vanadium			✓	✓	✓
	IC	Bromide, Fluoride				✓	✓
Additives	ICP-OES	Boron, Potassium, Molybdenum, Sodium, Phosphorus, Silicate ³⁾ , Silicon			✓	✓	✓
	IC	Adipic acid, Nitrate, Nitrite, Phosphate				✓	✓
	HPLC	Benzoate, Benzotriazole, 2-ethylhexanoic acid, Isononanoic acid, Mercaptobenzothiazole, Octanoic acid, Sebacic acid, Toluic acid, Tolytriazole					✓

ICP: Optical emission spectrometry with inductively coupled plasma
 IC: Ion chromatography
 HPLC: High performance liquid chromatography

1) calculated using the refractive index
 2) calculated using magnesium and calcium
 3) calculated using silicon

filling a system, as insufficient water quality often occurs with limescale deposits. OELCHECK tracks its cause when testing the water quality. However, a coolant can also contain bromides, fluorides or metal elements, which are disseminated from the components built into the system and which affect its quality. When mixing two coolants, sludge deposits can form quickly. As a rule, coolant and heating circulation systems are not hermetically sealed. If dust enters during operation or filling, the silicon content increases. Yet silicon is also often present in coolant as an anti-corrosion substance. That is why OELCHECK engineers consider carefully the value of silicon or silicate minerals when checking for additives.

Additives

Coolants generally contain a whole host of additional substances to ensure that they achieve long resting times and that the various metallic alloys in cooling systems are protected against corrosion. However, over time the additives break down and the coolant loses performance. It is therefore logical that OELCHECK also investigates the content

of any remaining additives and draws conclusions from the resulting values concerning the reusability of the coolant.

All-inclusive

It goes without saying that the new OELCHECK analysis kits for coolants and anti-freeze agents are, like the tried-and-tested kits for oils and lubricating

greases, all-inclusive. The kits are prepaid, and the price includes the costs for the complete analysis and diagnostics by an OELCHECK engineer. Within Germany, samples can be collected and dispatched at no cost using the enclosed UPS return slip. Finally, OELCHECK customers benefit from free access to our customer portal, lab.report, which contains all results, as well as online sample entry and our technical hotline.



Preparing a sample for ion chromatography

QUOTATION & ORDER
 Phone +49 8034-9047-250 • akv@oelcheck.com

OELCHECK will be happy to advise you on choosing the right all-inclusive analysis kit for your coolants and anti-freezes!

Classic Cars by Tom Fischer



The workshop in Brannenburg and its owner, Tom Fischer.



When push comes to shove, classic cars are an investment. Yet once you've discovered that passion, that fascination for their classical beauty, the sound of their engines, and the smell of their old, fine materials, there's nothing better than that unique feeling you get when you're behind the wheel. Owners of such vehicles treasure that unique buzz. And the faithful restoration and preservation of such classic cars is an art form in itself. Those who wish to cut no corners entrust their classic cars to a specialist such as Tom Fischer.

Tom Fischer Classic & Race Car Service was established in 1991, and has been at home next door to OELCHECK in the Upper Bavarian town of Brannenburg for the last 12 years. The workshop employs 15 highly qualified members of staff, each of whom set themselves high standards, are passionate and pay great attention to detail.

Tom Fischer is a big name in this industry and clients from around the world entrust him with their vehicles, be they from Moscow, Los Angeles, Vienna or Frankfurt. High-value vehicles from famous makes are restored, primarily those from the 1930s to the 1960s, even if there are a few mavericks along the way. Some of these dream cars, of which often fewer than 100 were made, are worth a seven-figure sum.

Quality with no compromise

Before you even lay a finger on such a vehicle, complex material analyses and research into the historical archives must be carried out. High-quality restorations are extremely complex and, depending on the value of the vehicle, the preparatory work alone can take more than a year. Yet Tom Fischer and his team know no compromise when it comes to quality. Only by restoring the vehicle in this way will you retain the car's originality. The workshop in Brannenburg is equipped with state-of-the-art technology, but the traditional work processes mastered by the team are the decisive factor.

Use grease – but in the right way

The car's engine, gears and rear axle will be thoroughly overhauled and supplied with fresh lubricating grease. Yet sometimes this is easier said than done, as the high-additive lubricants used today are generally not suitable for classic cars and are often incompatible with the sealants and metals used in the past. Furthermore, modern engine oils have such a strong cleaning effect that they remove deposits on the engine's interior, which may cause blockages in the oil lines as well as severe engine damage as a result.

Classic cars require unalloyed or very mild alloyed lubricants. In their engines, for example, many single-grade engine oils are used. Depending on the season and the climate, a high-viscosity summer engine oil SAE 40 or a low-viscosity winter engine oil SAE 10W will be used. Manual gearboxes with

reduced loads require an unalloyed gear oil with a GL-1 API classification. A GL-3 gear oil, on the other hand, is mildly alloyed and contains EP additives. As a rule, this can also be used in manual gearboxes with non-ferrous metal components. Yet sometimes there is a difference between the theory and reality – an Alfa Romeo 8C, winner of the Mille Miglia 1936, for example, has a gearbox made out of non-ferrous metals which cannot withstand any organometallic EP additives. This requires extensive knowledge to avoid the wrong gear oil being added. Knowledge that Tom Fischer and his team possess, even though they are challenged on an increasingly regular basis. Should changes be made to a classic car's drive or engine without being logged, their experience is particularly sought after.

Oil analyses for maximum safety

To err on the side of caution, oil analyses are carried out before doing any work on an engine. Such analyses provide crucial

information about its state and flag any possible damage. For example, when analysing engine oil from an Alfa Romeo engine, wear particles with an unusual composition may be found, clearly indicating wear in the bevel gear. Bevel gears were used mainly in the 1920s and 1930s for driving the camshafts to control the valves on four-stroke engines. After such a discovery during an oil analysis, a replacement part was produced for the component in question before further damage could be caused. Even after they have been run in, oil samples are taken from the engines and gearboxes of classic cars and studied by OELCHECK. It will quickly become apparent whether the lubricant is the correct fit, everything runs smoothly or whether some problems may be feared when driving. Only when all parameters have been met is the car handed over to the customer. Many a precious item is sent to its destination by air freight. And when it's time for their next service, the classic cars return to Tom Fischer's workshop – because the owners know they can rely on his knowledge and diligence when it comes to their expensive dream cars.



A Corvette on the Pan-American Highway

NEW

New for gas engines – a kit that can do it all

Engines in continuous use, constantly high operating temperatures and always under full load – it all sounds like a back-breaking job. Yet this is routine for most energy generation plants with gas engines. Nowadays, small to medium-sized gas engines (20 kW to 1500 kW), which usually run on biogas and only rarely with clean, natural gas, are predominantly found in combined heat and power (CHP) plants (such as thermal power stations).

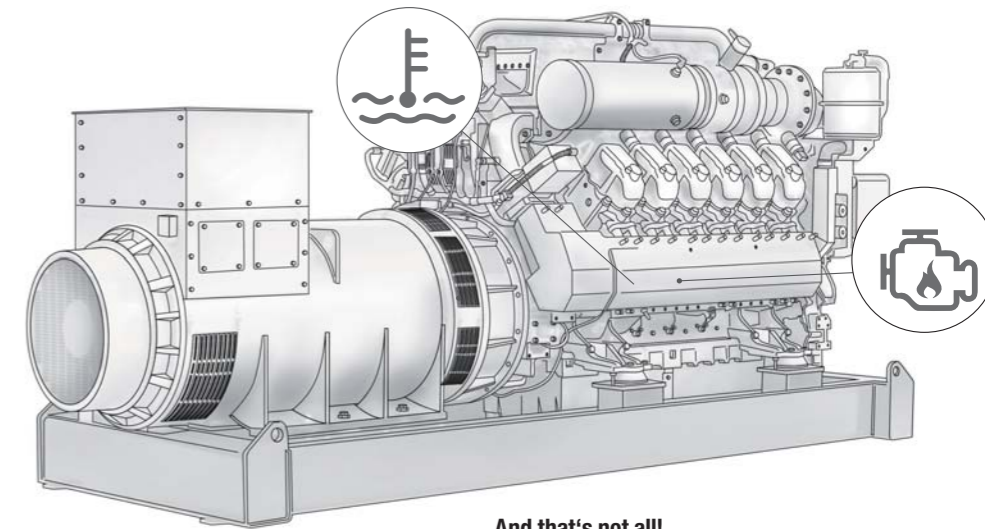
As a result, the engine oils in the gas engines must pull their weight. They are expected to contribute to:

- Long engine life cycles through wear and corrosion protection
 - Neutralisation of gas components through a high alkaline reserve
 - Good thermal and oxidation stability thanks to special base oils
 - High engine cleanliness through detergent additives
 - Longest possible oil change intervals
- Or in short: a reliable, long-term lubrication under all operating conditions and various biogas compositions.

Biogas, which is derived from the fermentation of biomass, contains nitrogen, carbon dioxide, acids, hydrogen and oxygen as well as the energy-rich methane (50-75%). The highly fluctuating gas quality and composition is a major challenge for engine operators.

Very often, and above all with the fermentation of manure and animal waste, hydrogen sulphide occurs, which then ends up in the engine with the biogas. The combustion process may then result in sulphur dioxide (SO₂) and sulphuric acids being generated, which may cause corrosive wear and corrode the engine components. The engine oil must be able to neutralise these acidic components and the hydrogen sulphide to prevent damage to the gas engine.

Regular oil analyses indicate whether the gas engine oil is still able to fulfil its role. Due to the high fluctuations in biogas composition, analyses are essential for recognising damage early on and determining the optimal time period for changing the oil, as an acidic oil can corrode vital components.



It's not just gas engines that run on biogas, but also natural gas engines could be placed in danger if the natural gas is mixed with parts of a very different special gas. For these engines, too, which mainly feed a significantly higher output into the network, it is of particular importance to carry out oil analyses regularly on oil change intervals of over 5,000 hours or oil filling quantities of several hundreds of litres. If the gas engine oil can no longer neutralise acidic components, such as those that are present in biomethane, for example, even engines running on natural gas will suffer significant corrosion. Engine oils as well as coolants from all gas engines, irrespective of whether they run on natural gas or biogas, can be analysed with the newly designed gas engine kit, recognisable by its mint green cap. The scope of the study is comparable to the all-inclusive analysis kit 4 available up to now. During the course of the transition to the new gas engine kit, OELCHECK has decided to reduce the price. In comparison with kit 4, this lower price takes into account the fact that the samples from the gas engine will be studied mainly for trend analyses and are therefore easier to comment on. In addition, the entry of samples is increasingly taking place either online or via the app using a QR code. The costs for complex data collection have therefore fallen.

And that's not all!

For the analysis of water-based coolants from gas engines, the same sample containers with the mint green cap can now be used. They will then be analysed using the Advanced scope for coolants. Observing the changes in coolants is also becoming increasingly important for gas engines. This is shown in some manufacturer guidelines, for example, which now prescribe an annual coolant check.

In a gas engine oil sample, up to 30 elements can be determined using special devices which shed light on wear and changes in additives and contaminants. These include the PQ index, viscosity at 40 and 100°C, viscosity index, IR index (spectrum comparison) with oxidation, nitration, sulphation, base number (BN), acid number (AN), ipH value, contaminants with dust, coolant (glycol) and water.

In terms of coolants, the lab report contains important data on the coolant concentration and state, water quality, decomposition products, contaminants and changes in additives. Values for density, pH value, conductivity and water hardness are also provided, among others.

The scope of analysis recommended by reputable engine manufacturers is covered with the new gas engine kit. Furthermore, experienced engineers assess the values in detail and provide recommendations for how to proceed.

Thanks to the new gas engine kits, you can have all your gas engine samples analysed in the future, meaning you always receive the best analysis of your engine oils and your coolants from natural gas and biogas engines as well as a diagnosis that you can rely on.



Would you like to learn more about optimal lubrication and oil monitoring for gas engine oils?

If so, there are still places available for OilDoc's seminar, Gas Engines, from 2-5 May 2017 in Brannenburg...



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Q & A

10% of all lubricants analysed by OELCHECK have since become lubricating greases. Which parameters are analysed compared to oils? How conclusive are the diagnoses? How can the results be used in practice?

OELCHECK:

OELCHECK is one of the few laboratories around the world that routinely tests lubricating greases. You can benefit from our lubricating grease analysis in practice from several perspectives:

- A fresh grease analysis allows the quality consistency and practical suitability to be checked.
- A used grease analysis provides information about the state of the grease used.
- Regular trend analyses allow any damage to be spotted early and reduce the risk of component downtime. Relubrication intervals can be optimised.
- Routine checks ensure the most suitable lubricating grease can be chosen.

Analysis kits for lubricating grease



OELCHECK offers five specially designed analysis kits for lubricating greases. Each kit contains the analysis parameters of the previous kit in the range. As a rule, we need only 3 grams of grease to carry out a comprehensive analysis.

Kit 1: Wear, contaminants, additives (AES)

During every grease analysis, OELCHECK uses the AES method (according to the rotrode principle) to identify up to 26 elements that indicate wear, contaminants and the state of additives.

Kit 2: AES + FTIR + PQ Index

The use of FT infrared spectroscopy (FTIR) allows the type of grease, in particular base oils, to be checked. The age and oxidation of a grease can also be assessed using this spectrum based on too high a temperature or too long a period of use. The AES process only allows particles up to a size of approximately 25 µm to be verified. The PQ index, however, includes all magnetisable iron par-

ticles present in the sample. Using this information as well as the iron levels from the RDE element analysis, OELCHECK diagnostic engineers can draw important conclusions on the wear state of the lubricated components:

■ Normal wear

- Relatively low increase of all wear elements
- Iron (Fe) up to approx. 80 mg/kg, chromium (Cr) up to approx. 10 mg/kg
- Moderately increased PQ index, up to max. 60

■ Corrosive wear

Water, acids, alkalis, aged grease

- Relatively strong increase of all wear elements
- Iron (Fe) up to approx. 150 mg/kg, chromium (Cr) up to approx. 15 mg/kg
- PQ index more than 50% below the value for iron (Fe) (rust is only slightly magnetic)

■ Fatigue wear and scuffing

End of a bearing service life

- Moderate increase of wear elements
- Iron (Fe) lies more than 50% below the PQ index value
- PQ index far exceeds 300

■ Mechanical-abrasive wear

Hard contaminants, dust

- Relatively strong increase of all wear elements
- Iron (Fe) over 100 mg/kg, silicon (Si) over 50 mg/kg
- PQ index exceeds 150

Kit 3: AES + FTIR + PQ Index + Water

Using the Karl Fischer titrator, OELCHECK analyses the grease sample to determine the water content. Alongside 'hard' water, which has penetrated the bearing position from the outside, water can also be in evidence which entered in the saponification process during grease manufacture.

Kit 4: AES + FTIR + PQ Index + Water + Bleed test

Lubricating greases generally contain more than 70% base oil, with the rest being made up of a mixture of thickeners and additives. Similar to a sponge, the thickener retains the base oil. Yet during long periods of use or with high temperatures, vibrations, water entry or even mixtures of grease, this function can be compromised. The oil separates from the thickener once again – the grease 'bleeds out'.

Using a test developed in-house, the bleeding behaviour of used and new grease is compared. Should a grease bleed out too quickly, the oil loses its ability to act as a lubricant. If a used grease bleeds out too slowly, this usually indicates it has become too dry due to bleeding or oxidation, as it has not been sufficiently relubricated often enough.

Kit 5: AES + FTIR + PQ Index + Water + Bleed test + Consistency

NLGI consistency grades, indicated as numbers (generally 00 to 3) after the grease name, describe the relative hardness of a grease. In order to measure the consistency, a standard cone is inserted into the grease. The further the cone enters, the softer the grease and the lower its NLGI consistency grade. The consistency or penetration number are predominantly used for fresh greases. It is then assessed whether the product meets the requirements to be used as a lubricating grease. With used grease, a consistency grade other than that used for fresh grease points to a mixture which generally renders the grease softer, for example.

Correct sampling is an absolute must



One requirement for a conclusive result with any analysis is correct sampling. To this end, OELCHECK has put together a special grease sampling kit. Every kit contains a multifunctional syringe with a connectable hose for sampling and several spatulas.

You can find a detailed guide on sampling at www.oelcheck.de/en.

OELCHECK engineers can advise you when it comes to setting the optimal scope of analysis, examination intervals, grease sampling locations and sample quantities.

If you have questions about tribology or lubricant analysis, OELCHECK can answer them. Send us your questions by e-mail (info@oelcheck.de) or by fax (+49 8034-9047-47).