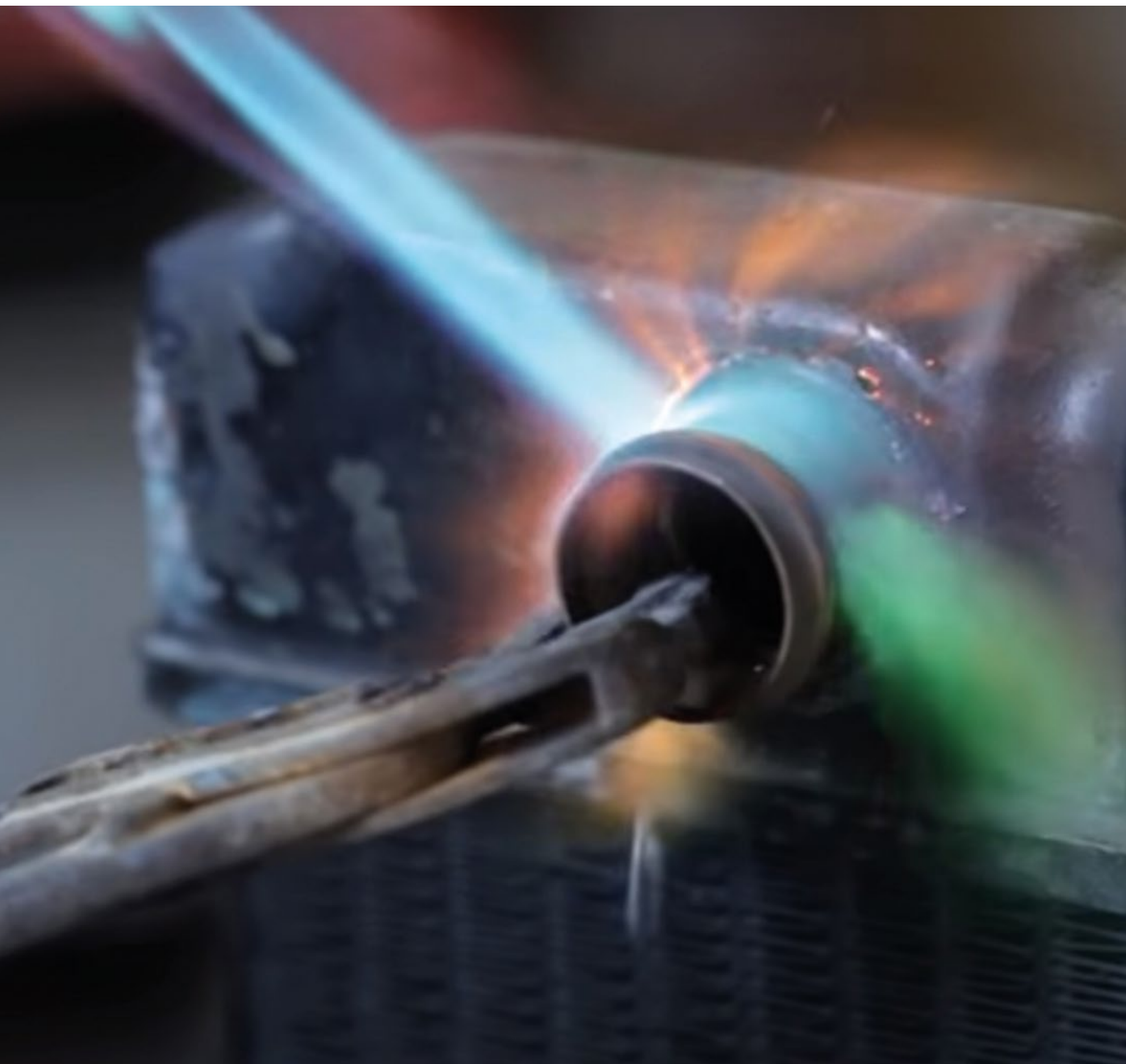




Winter 2023

OELCHECKER



HOT TOPIC

Not the best of friends –
fluxes and coolants

PARTNER FORUM

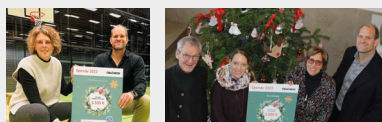
Examples to follow –
the Komptech concept

OILDOC ACADEMY

Symposium on deposits in lubrication
and hydraulic systems

AND MUCH MORE...

CHRISTMAS CHEER FOR THE WHOLE YEAR!



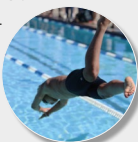
Christmas comes with presents! While these are usually material items, as gift recipients we secretly long for love and understanding more than for anything. Admittedly, our donations to various projects in our home town of Brannenburg are also primarily material in nature.

But as always, we have chosen the recipients carefully. After all, the aim is to implement projects that meet precisely the needs of the recipients and provide them with long-lasting enjoyment that extends far beyond the turn of the year.

As we have done for 20 years now, we also refrained from giving Christmas presents to our customers and business partners at the end of 2023. Instead, we thought of the children and young people, the elderly and the athletes in our community.

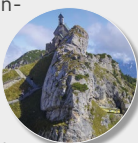
■ For the triathlon department of TSV Brannenburg: €5,000

This covers professional training for the around 60 young members in the triathlon sports of swimming, cycling and running. Moreover, the club fees remain affordable for members from all levels of society.



■ For a trip to Wendelstein for senior citizens: €4,000

In April 2024, a hundred senior citizens from Brannenburg, Flintsbach and Nußdorf will take the rack railway for a traditional Weisswurst breakfast while enjoying the magnificent views from Wendelstein mountain. This event is supported by the multi-generational Flintsbach centre and Wendelstein railway.



■ For the nature trail and experience station "Tiere am Bach": €3,500

We already supported the establishment of the trail in 2012 with €12,000. We are now sponsoring the new "Tiere am Bach" experience station. The aim is to enable children to explore the stream as the home of many small creatures.



■ For the sports events of TSV Brannenburg: €3,500

A bold and sturdy finish arch will soon be used at TSV Brannenburg events. It is inflatable and also serves as an event tent. All ten departments of TSV can use it flexibly for competitions and club events.



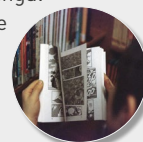
■ For the Special Educational Development Centre of Brannenburg Inttal School: €600

Our donation finances the workshop "Chatting, gaming and cybercrime". It is about prevention and raising awareness among young people about hot topics such as media addiction and self-image in social media.



■ For young visitors to the Catholic Library: €500

Manga, comics originating from Japan, are particularly popular among children and adolescents. Young visitors to the library repeatedly asked for more manga. Thanks to our donation, this wish has finally come true.



Naturally, we visited in person to hand over our donations and once again experience the great joy of giving!

Paul Weismann Barbara Weismann

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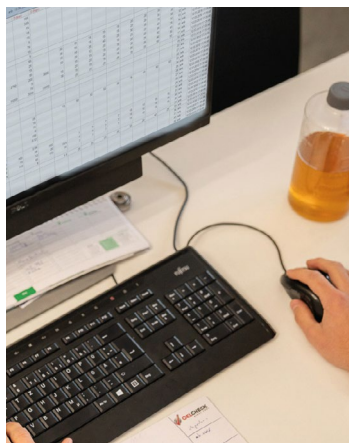
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OELCHECK EXPRESSO



Tailored for 200,000 – limit value tables from OELCHECK

Whether it's impurities, wear metals or general oil condition such as viscosity and oxidation, no tribologist can assess the results of a lubricant or fuel analysis without limit values. There are many limit values defined according to general criteria. But these are generally not effective. OELCHECK therefore only uses its own limit values.

Find out:

- How our more than 200,000 machine-specific limit value tables are created.
- How OELCHECK tribologists use our limit values on a daily basis.
- And how you can actively contribute to the quality of the recommendations given by OELCHECK tribologists.

→ Q&A | Page 7



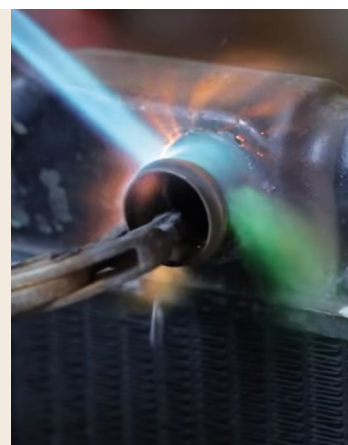
Not the best of friends – fluxes and coolants

Corrosion is a danger to cooling systems! With regular coolant analyses, it is possible to identify progressive corrosion as well as the effect that impurities in the cooling system have on corrosion behaviour. The fluxes used for soldering the coolers play a key role here:

- fluxes affect the coolant and the entire system.
- A high concentration of potassium aluminium fluoride-based fluxes in the coolant degrades corrosion protection additives.

Find out how you can remedy and prevent this!

→ Hop topic | Page 4–6



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"Certified used" – environmental specialist extends the lifespan of machines

Komptech GmbH is a hidden champion from Austria. With more than 4,000 customers in over 80 countries and an export rate of 95%, Komptech is a technology leader in waste processing. Komptech machines enable new raw materials to be extracted from waste, which can then be returned to production.

Komptech offers sustainable solutions and extends the lifespan of machines whenever possible. This is why used machines are also restored as part of the "Certified used" programme. OELCHECK all-inclusive analyses play a decisive role here. Get to know the essential parts of the "Certified used" programme.

→ Partner Forum | Pages 10–11



Beware – new coolant formulas from 2023

In December 2023, a new regulation came into force that has a major impact on existing coolants. Since more stringent protective measures need to be followed when handling some of these products, many coolant manufacturers have decided to modify their formulas.

But the solutions are rather varied. For instance, two coolants that formally meet the same specification may have a completely different structure in the future. However, this can change the compatibility and longevity of the coolant!

Find out about the regulation and how to avoid unpleasant surprises in practice!

→ Top tip | Page 6



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FLUXES AND COOLANTS

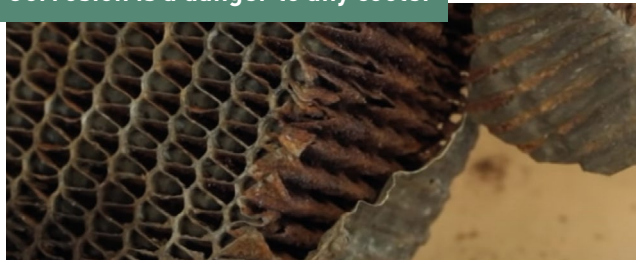
NOT THE BEST OF FRIENDS

Aqueous coolants are extremely important in ensuring the safe operation of engines, converters and many other systems. But during use, their condition changes due to ageing and contamination. In the past, examinations using handheld devices and measuring strips were carried out on site to check antifreeze and heat transfer properties and to find signs of degrading basic protection additives.

Monitoring with OELCHECK all-inclusive analyses goes far beyond this and ensures a high level of safety when using coolants. This is because, provided that regular analyses are carried out, we can now not only detect existing corrosion, but also interpret indicators of its future formation and warn of impending damage. The fluxes used when soldering the coolers also continue to play a key role here!

Engines, converters and many other technical components need to be protected against overheating. The heat lost during operation is dissipated, thereby cooling the components. This is done with the help of air, water, cold mixtures with special salt compounds or coolants, which in most cases are based on glycol. The latter are not just used for radiators in motor vehicles. Aqueous glycol-based coolants are also used in cooling systems for wind turbines, locomotives, stationary engines (such as in energy generation using bio-gas) or in power supply converters.

Corrosion is a danger to any cooler



Heat exchangers are predominantly made of aluminium, while their connections and supply lines are made of aluminium, stainless steel, copper or brass. Aluminium is a good heat conductor, but it can also corrode. In the case of coolers, oxygen corrosion is the main concern. With this form of corrosion, the metal decomposes in the presence of oxygen and a conductive fluid. Different variants of corrosion can occur in this process:

- **Surface corrosion:** occurs on parts or even the entire surface of the material.
- **Galvanic corrosion:** is based on an electro-chemical reaction between two different metallic materials, such as aluminium and steel.
- **Pitting corrosion:** is an aggressive form of corrosion that produces holes or cavities. It is mainly caused by halides such as chloride, fluoride and bromide.
- **Crevice corrosion:** occurs in gaps that are not sealed, such as overlaps, attached bars and in the case of non-continuously soldered or welded seams.

Coolants and protecting against corrosion

Coolants and antifreeze agents have a variety of tasks. They are intended to ensure optimum heat supply and dissipation as well as to protect against corrosion, cavitation, foam formation and deposits. At the same time, they must not attack the metals and sealing materials installed in coolers. Up to 10% of a coolant concentrate consists of additives whose main task is to protect the metallic surfaces in the cooling circuit against corrosion.

Over time, additives for corrosion protection have been continuously developed to meet the increased requirements for durability, material diversity and environmental and health protection. While older formulas consisted of just a handful of components, which could often be detected using simple measuring strips, today's formulas contain a complex combination of organic and inorganic salts, which can only be measured and evaluated in the laboratory.

OELCHECK monitors and makes a discovery

OEMs and operators are increasingly focusing on consistently monitoring coolants by means of laboratory analyses. OELCHECK examines all important parameters of the fluids and ensures their functionality over a long period of time and thus the safe operation of the refrigerated units.

The following are critically examined:

- The condition of the coolant, its ageing or degradation products, such as glycolate, oxalate and formate
- The (base) water quality
- Changes to additives
- Contaminants
- Elements indicating corrosive wear

Any existing wear due to corrosion is primarily reflected in the content of metals in the examined coolant. But are there certain substances that promote corrosion? Can these also be detected in the coolant in order to identify a tendency towards impending corrosion at an early stage? And how do the individual parameters correlate?

Matthias Aßmann
OELCHECK tribologist





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Fluxes affect the coolant and the entire system

It has long been known that some substances can promote corrosion. Some of them, such as chloride or sulphate, come from the water mixed with the glycol. As a rule, the requirements for the base water are therefore described in every operating manual for coolants. Substances that penetrate from the outside are also often considered. On the other hand, "built-in" contaminants are very often forgotten, either from assembly (assembly pastes and corrosion protection oils) or from production (processing fluid and flux). Fluxes have proven to be particularly critical.

Potassium, aluminium and fluorine are constituents of the chemical compound $K_{1-3} Al F_{4-6}$ (potassium aluminium fluoride), which is very commonly used as a flux when brazing aluminium. In this CAB process (Controlled Atmosphere Brazing), the individual components are joined together using a solder. The solder usually consists of an aluminium alloy whose melting point is significantly lower than that of the components. The purpose of the flux is to remove the natural oxide layer present on all aluminium surfaces. This layer would negatively affect the solder joint mechanically and in its electrical properties. In addition, the flux must allow the solder to flow freely and prevent the formation of a new oxide layer on the surfaces.

Fluxes made from a compound of potassium, aluminium and fluorine are not corrosive in themselves, but remain in a thin layer on the aluminium after the components have cooled down. In most cases, too much flux is used, as too small a quantity leads to unstable solder joints and thus possibly to non-compliance with strength values and/or part specifications. But excessive flux does not initially have any negative effects on the soldering process or on the component itself.

This means that fluxes can be detected in almost all cooling systems with soldered aluminium components. In increased concentrations, however, they activate metal surfaces and break down corrosion inhibitors in the coolants. This creates favourable conditions for corrosion to occur. What's more, the fluoride promotes pitting corrosion, as is known from chloride. In many cases, coolants contaminated with flux residues are also subject to increased degradation products of glycol and a decreased pH value of the liquid in the laboratory.

→ A high content of potassium, aluminium and/or fluorine in a coolant generally promotes the formation of corrosion. In laboratory analysis, additional anomalies are also always found. These can affect various parameters in different combinations. There are no universal laws here. Each case must therefore be considered individually and always in conjunction with all other values of an analysis. The interactions between materials, solder, flux and coolant in the respective cooling system must also be taken into account.

The flux problem has been known in the automotive industry for around 20 years. Other areas are only just beginning to experience it. In wind power, for example, more and more converters are being switched from air to water cooling due to the increasing output. Here, OELCHECK tribologists have been able to help a large wind turbine manufacturer develop a strategy for dealing with flux loads from coolants.

Remedy and prevention

Due to the poor solubility of fluxes in cooling water, contamination with them cannot generally be eliminated, even with several coolant changes.

Other measures, such as switching to a different flux or cleaning, are not easy to perform or have their pitfalls. Due to this problem, coolant manufacturers have developed solutions including "flux-tolerant coolant additives". These prevent the release of harmful components in a variety of ways. But unfortunately, these fluids are not the silver bullet they are hoped to be against the issue of flux. This is because they only work against potassium aluminium fluoride-based fluxes. As such, OELCHECK tribologists have determined that some cooler manufacturers have switched from "conventional" fluxes to products with formic acid, for example. Restrictions on the fluoride content of components can thus be circumvented, for example. Unfortunately, the analyses show that the changed flux continues to lead to additive degradation and corrosion. The number of cases is still low, but OELCHECK tribologists will continue to monitor further development closely.

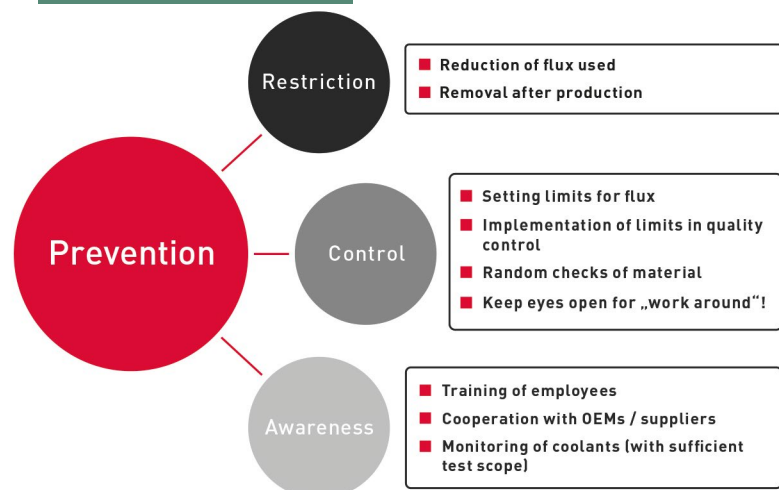
However, a worryingly high concentration of fluxes in coolants can be prevented:

Prevention includes regular checks using OELCHECK all-inclusive analyses!

Five tailored OELCHECK all-inclusive analysis kits with different combinations of selected test methods are available for monitoring coolants.

We recommend a regular check with an Advanced or Premium all-inclusive analysis kit for reliable early detection of flux contamination and/or impending corrosion due to contamination with flux.

How prevention works!



Do you have any questions about the OELCHECK all-inclusive analysis kits for coolants?
Please contact us by e-mail (sales@oelcheck.de) or tel. +49 8034 9047-250!

Beware: New coolant formulas since December 2023!

In the world of coolants, there are always new formulas and additive concepts. Many of them are driven by legislation to avoid environmental and health hazards. In December 2023, a new regulation came into force that has a major impact on existing coolants.

According to the classification under Regulation (EC) No. 1272/2008 (CLP Regulation), from December 2023 every product containing ≥ 3000 ppm of the widely used additives based on 2-ethylhexane acid ("2-EHS") and its salts must be classified and declared as hazardous to health. (Rep. 1B & H360D May cause harm to the unborn child). Since this classification significantly tightens the protective measures when handling coolants, many coolant manufacturers have decided to change the formula.

But the solutions are rather varied. For instance, two coolants that formally meet the same specification may have a completely different structure in the future. This is particularly relevant for questions regarding the compatibility and longevity of coolants.

Distinction between OAT additives such as 2-EHS is only visible with the **Premium all-inclusive analysis kit** (orange).

OELCHECK therefore recommends carrying out incoming goods inspections with the Premium analysis kit and also revising purchasing specifications. The Premium analysis kit also includes the sample scope of choice for routine monitoring with regard to the current situation.



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THOROUGHLY TESTED AND NOW INSTALLED

NEW GAS CHROMATOGRAPH FOR MEASURING FUELS IN ENGINE OILS



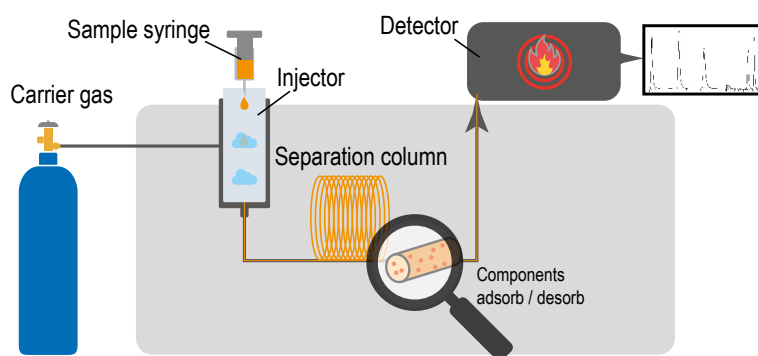
OELCHECK determines the fuel content for all used engine oils from diesel, petrol and biodiesel engines. The laboratory report specifies the percentages of the respective fuels in % (m/m).

Why determining fuel content is so important

Unburned fuel can always get into the engine oil during fuel combustion in the engine. However, if the engine oil contains too much fuel, its viscosity drops. As a result, the engine oil can no longer reliably provide the important lubricating film that protects the moving parts against wear.

Perfect measurement accuracy and efficiency

We carried out more than 1,000 test measurements in advance with the new gas chromatograph, whose sample carrier can be loaded with 150 bottles. The Shimadzu Nexis GC-2030 impressed us with its excellent results in terms of measurement accuracy, efficiency and ease of use. It is the first gas chromatograph from Shimadzu in the OELCHECK laboratory and replaces its predecessor. Of the four gas chromatographs in our laboratory, the new instrument is specialised in determining fuel content in engine oils.



Principle of gas chromatography (simplified scheme)



→ Learn more about our gas chromatographs, the finest detectors in the OELCHECK laboratory:
www.oelcheck.de/wiki/gaschromatographen



LIMIT VALUES AT OELCHECK

OELCHECK uses limit values when evaluating lubricant and fuel analyses.

Where do these values actually come from? And how do you apply them when examining of up to 2,000 samples every day?



When examining lubricant and fuel samples, we usually determine 35 to 50 different individual values. However, we cannot evaluate the samples on the basis of these figures alone. Even the most experienced tribologist needs limit values in order to evaluate the results of an analysis and make recommendations. More than 200,000 machine-specific limit value tables are therefore stored in the large OELCHECK database. These are increasing all the time, because as soon as a sample for a new lubricated machine component or a new lubricant arrives in our laboratory, for example, we create another data master. All information is recorded digitally in the large OELCHECK database and prepared with the help of the company's own software programs. After all, we need to be able to enter, adjust and ultimately use the limit values when evaluating samples in a clear and quick manner.

OELCHECK uses tailored limit values

A variety of limit values are required when assessing a wide range of parameters in a laboratory report. Whether it's impurities such as water or dust, the content of wear metals or the general oil condition such as viscosity or oxidation, nothing is possible without limit values.

Existing limit values can come from different sources, including:

- Standardisation bodies such as DIN or ASTM (American Society for Testing Material)
- OEMs of machines and components
- Manufacturers of lubricants and fuels

However, these values are usually defined according to general criteria or they only take into account some of the values analysed in a lubricant sample. Yet, a precise diagnosis can only be obtained through a holistic and individual examination of each particular case.

OELCHECK therefore uses the **company's own machine-specific limit value tables**. Although these take into account the specifications of the OEMs and other sources, they also take into account the results of over five million lubricant and fuel samples that we have examined in our laboratory to date. This is supplemented by our expertise and the extensive experience we have thanks to our close exchange with countless customers. Usually, the limit values are defined based on our database and experience, but also with the input of our customers and feedback from the field.

Our tailored limit values do not generalise, but rather:

- take into account the respective applications and their wide range of requirements
- consider the individual load level of the components
- include the various environmental conditions
- also incorporate the different requirements and questions of customers when evaluating the analyses

However, evaluating a sample on the basis of limit values alone can also be misleading! Therefore, we do not publish any limit values in our laboratory reports. It is simply not enough to look at individual values; they must always be seen in context.



This also includes taking into account information such as the fill quantity and service life of a lubricant or fuel as well as the trend of its development. Preparing a diagnosis is therefore often multi-layered and complex, which is why it should generally only be left to an experienced tribologist.

Limit values in use at OELCHECK

When an OELCHECK tribologist starts assessing an analysis, they receive all available information from the company's own evaluation software. These include the current analysis values as well as any previous trend samples, the corresponding limit values, the reference values of the fresh product, various diagrams such as the FTIR spectrum, photos of the sample bottle, all available information on the component or machine and on the lubricant or fuel.

The limit values provide initial guidance for the tribologist. If limit values are undershot or exceeded, a corresponding comment is made by the tribologist. However, it is not sufficient to evaluate the affected parameters individually; this should always take place in the context of other analysis values in order to identify the cause or further effects.

For example, excessive water content may already represent a valuable piece of information for the customer. Nonetheless, it is also often possible to draw conclusions from other analysis values as to whether it concerns condensation or water ingress due to a leak in the cooling circuit. This allows the customer to receive a corresponding recommendation for action.

Or looking at the example of viscosity: When it comes to an engine oil, the tribologist can use their knowledge and data to assess whether increased viscosity has been caused by oil oxidation, nitration, soot entry or a coolant leak. In the case of wear element values, for example, additional trend curves are often very helpful. How have the values developed over time? Are there currently any alarming outliers?

How you can support us...



- Ultimately, the tribologist must always decide whether a situation is critical and what the recommendation to the customer should be.
- However, even in the age of digitalisation, we depend on the completeness and quality of the information provided with an analysis. Although samples can be evaluated along many points even with little information, the same principle applies as when visiting the doctor: the more information provided for the investigation, the more accurately the analysis data can be interpreted. And this is where our customers' duty lies. Therefore, in your own interest, please fill out our sample information forms carefully. The quickest and most convenient way to complete and

transfer the sample information forms is electronically via the OELCHECK APP 4.0, with or without the use of QR codes, via the OELCHECK customer portal or via data import using an API. The key data concerning the lubricant and the machine is entered once during electronic data transfer and is then always available. You simply add the variable data of the current oil sample (e.g. oil level time) and can also inform us of any anomalies.



OELCHECK also answers your questions on the topics of lubricant and fuel analyses as well as tribology. Contact us by e-mail (info@oelcheck.de) or fax +49 8034/9047-47.



Matthias Wiesheu (laboratory chemist), Johanna Baumann (laboratory chemist), Genoveva Hahl (laboratory chemist), Andrei Olteanu (office management specialist)

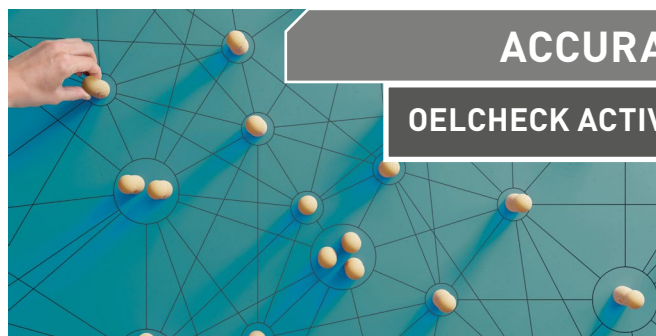
Today's trainees are our specialists of tomorrow! In September 2023, we welcomed four new trainees. One of them is completing an office management apprenticeship, and three new apprentices are working in the OELCHECK laboratory. This means that we are currently training more new employees at the same time in the OELCHECK laboratory than ever before.

TOP TRAINING AND COOL JOBS AT OELCHECK

Young adults in particular, who like to work independently and take on responsibility, are welcome at OELCHECK.

In our company, they not only receive top training in theory and practice. Through their work, they also make an important contribution to sustainability and climate protection. After all, OELCHECK's lubricant and fuel analyses help to save valuable resources and reduce the carbon footprint of countless companies.

In the last ten years, 21 trainees have completed their training at OELCHECK. Seventeen apprentices were taken on, eight of whom are still employed by the company.



ACCURATELY IDENTIFYING ANTIOXIDANTS

OELCHECK ACTIVELY SUPPORTS WORLDWIDE RING TRIAL

OELCHECK sends 1,224 samples around the world

The ageing process to which all lubricants are subjected during their use is essentially dominated by the oxidation of the base oil. Antioxidants are added to the oils to effectively slow down this ageing process. These are mainly additives based on amines and phenols. Yet over time, these additives break down. This increases the risk of oxidation products forming, which in turn can lead to the formation of paint-like deposits in the lubricated system.

This is why antioxidant content is determined

In particular, the content of amines and phenols as well as their changes over the service life are used as an early warning system for hazards to the lubricated system due to deposit formation. The analysis procedure is carried out in accordance with the specifications of standard D9671 of the ASTM (American Society for Testing and Materials).

This standard is currently being revised and is expected to appear in a new edition in 2024. The determination of antioxidants is divided into three methods. Methods A and B now describe the determination of amines and phenols separately. Both use LSV (Linear Sweep Voltammetry) for the determination process, as before. Finally, Method C introduces a new technique, DPV (Differential Pulse Voltammetry).

In this case, amines and phenols are determined sequentially, but a second solvent component is added between the two steps. With the introduction of Method C, additional apparatus for the determination of antioxidants can also be used.

Before publication, the suitability of the revised standard must be verified by means of a successfully completed ring trial. For this purpose, 18 laboratories examined 34 sample pairs of fresh and used oils in accordance with the draft of the new standard. OELCHECK handled the sample logistics and homogenised a total of 1,224 samples, filled them and sent them to laboratories all over the world.

→ A huge effort for OELCHECK, but a win for lubricant analysis.

HIGHEST ACCOLADE FOR A TRIBOLOGIST WHO HAS MADE AN INCREDIBLE DIFFERENCE

Peter Weismann, one of the founders of OELCHECK GmbH and one of the world's leading tribologists, has been awarded the Georg Vogelpohl Medal by Gesellschaft für Tribologie e.V. (GfT). Globally speaking, this award is only comparable to the international Tribology Gold and Tribology Silver medals. The Georg Vogelpohl Medal is the highest German accolade and is awarded exclusively to individuals who have earned recognition in the field of research, development, application or the dissemination of tribological knowledge.

Friction, wear and lubrication – that's what the interdisciplinary science of tribology, a sub-area of mechanical engineering, is all about. And hardly anyone has such extensive expertise in mechanical engineering, chemistry, as well as the design and the diverse applications of lubricants and their interaction with the components of machines and engines, as Peter Weismann.

Tribology is a science, but it can only make a difference if it is directly put into practice. Peter Weismann was already aware of this at the beginning of his professional career. Over the course of his life, he has realised and propagated the findings of tribology and its invaluable effects on the use of lubricants – and he has made an incredible difference doing so.

A highlight of his career was the founding of OELCHECK GmbH together with his wife Barbara in 1991. Today, OELCHECK is the leading laboratory for the analysis of lubricants and fuels in Europe. Peter Weismann's tireless commitment, combined with creativity and entrepreneurial thinking, made this success possible.

Thousands of customers now benefit from OELCHECK lubricant and fuel analyses, far beyond Germany's borders. OELCHECK tribologists are just as familiar with a wide range of production processes as they are with the special operating conditions under which engines and systems operate.

The award ceremony for the Georg Vogelpohl Medal as part of the 64th Tribology Conference in Göttingen.

From left to right: Rolf Luther (Chair of GfT), Peter Weismann and his wife Barbara



They comment on the laboratory values of each lubricant or fuel sample analysed by OELCHECK and make specific recommendations for any necessary measures.

Until now, the focus of lubricant analysis has mainly been on determining oil changes depending on the condition, as well as the early detection of impending damage to lubricated components. However, another crucial aspect of lubricant analysis has emerged in recent years. This is no longer just about the operational safety and cost-efficiency of the individual operators of the machines and systems, but also about our environment!

Analysis plays a crucial role in keeping lubricants and the components they lubricate in use for much longer. This conserves resources, minimises waste oil and reduces CO₂ emissions to an enormous extent. Peter Weismann was already aware of these comprehensive effects of lubricant analysis when the term "carbon footprint" was just taking off. As a visionary, his thoughts and ideas have always been ahead of the times.

Today, as Technical Director (Advisory Board), Peter Weismann is an important driving force for both OELCHECK GmbH and many institutions and committees. Through this work, he is consistently committed to the sustainable use of lubricants for the benefit of our environment and the climate!



We were visited by the team from Wendelstein Werkstätten, which assembles the OELCHECK all-inclusive analysis kits. During a guided tour of our laboratory, each of the 15 visitors was able to see for themselves how important their work is for OELCHECK and our customers.

CARITAS WENDELSTEIN WERKSTÄTTEN HAS BEEN PRODUCING OELCHECK ALL-INCLUSIVE ANALYSIS KITS SINCE 2009



OELCHECK has been supporting social organisations in our region with donations for many years. But money alone is not everything, we also take other kinds of action. A special project is our cooperation with the Raubling plant of Wendelstein Werkstätten. These workshops are an institution of Caritasverband der Erzdiözese München und Freising e.V. They provide professional prospects to people whose participation in working life is made difficult by disability, accident or illness. As part of professional rehabilitation and qualification, the workshops offer vocational training and jobs for more than 500 people in the city and district of Rosenheim.

Most of the OELCHECK all-inclusive analysis kits are assembled at the Raubling plant of Wendelstein Werkstätten. The employees of the OELCHECK working group are full of enthusiasm and commitment, and they feel a sense of belonging with our company. The OELCHECK working group of Wendelstein Werkstätten ensures that nothing is missing in the boxes of analysis kits. With the ever-increasing number of work orders, we have been contributing to the financing of the workshops for many years, offering people meaningful employment and ensuring safe jobs.



The Komptech Terminator can be used as a robust, slow-running crusher for almost all types of solid waste. The hydraulic roller drive with load-dependent speed control utilises the highest crushing forces.

KOMPTECH MACHINES

TURNING WASTE INTO NEW RAW MATERIALS

Our world's resources are finite. But we are still wasting far too many of them and producing mountains of waste. What if we could use this waste, which seems worthless to most, as a global resource and create new opportunities?

This vision guides the work of the Austrian company Komptech GmbH. It supports its customers in extracting new raw materials from waste through extensive recycling; these materials can then be returned to production. For example, waste wood can be fed into the production of new wood materials or used as an energy source for heat and electricity production. Organic waste, on the other hand, can be converted into stable, plant-friendly humus substances through composting. For organic waste with a higher moisture content, fermentation is an economically and environmentally suitable treatment method. Clean energy is produced from the degraded organic matter and the fermentation residue becomes compost and liquid fertiliser.

With more than 4,000 customers in over 80 countries and an export rate of almost 95%, Komptech is a leader in waste processing technology. The environmental specialist's range of services includes all essential process steps for the treatment of solid waste and woody biomass. The company also has a worldwide service network, its own digital tools and extensive expertise in the implementation of site-specific reprocessing concepts.

Komptech's technology focuses on the following steps in waste treatment: crushing, screening, separation and sorting. Komptech recycling systems are designed and dimensioned according to customer requirements. This creates efficient solutions for handling complex tasks. Half of Komptech's machines are already available as e-mobile or hybrid versions. With comparable throughput, the Crambo e-mobile, for example, can save up to 70 percent of energy costs. In addition, the concept allows the use of renewable energy instead of fossil fuels and thus contributes directly to CO₂ reduction.

Komptech not only produces new machines and systems that process materials in such a way that the majority of them can be prepared for reuse. At Komptech, the machines themselves are also subject to the principle of sustainability. Thanks to a proven maintenance concept, the robust machines achieve a long service life. But it doesn't end there: Komptech also retrofits used machines and components, such as gearboxes, extends their lifespans and thereby contributes to the conservation of resources.

Examples to follow – Komptech extends the lifespan of machines

Komptech machines are consistently maintained. A service is due every 500 operating hours. This is mainly carried out by Komptech employees or by the company's partners.

OELCHECK all-inclusive analysis kits are always counted on, especially in European countries. The analysis kit and its accompanying sample note are perfectly designed to meet Komptech's requirements. Whether for hydraulic, gears or engine oil, fuel, coolant or lubricating grease – the kit is universally versatile.

Detecting impending damage early

Besides the oil condition, the focus of the investigations is on the condition of the individual machine components and signs that indicate impending damage.

- Proactively used, the OELCHECK laboratory reports reveal any changes and Komptech can take countermeasures in good time.
- Maintenance work is planned in a targeted manner and unforeseen breakdowns are prevented.
- If a lubricated component is damaged, this is usually revealed early on by the analyses. As a rule, the affected component can be reprocessed and its useful life thus extended.
- With regular careful maintenance, the machines can fully utilise their robustness and reliability and achieve impressive service lives.

A Terminator 5000S direct, for example, recently achieved a record service life of 70,000 operating hours.



- Oil changes still take place at fixed maintenance intervals of 500 operating hours, but there is a trend towards condition-dependent oil changes in the future. This makes OELCHECK analyses absolutely indispensable.

The best new machines become the best used machines

A used Komptech machine is far from scrap metal! Here, too, Komptech focuses on sustainability and gets many used machines back into shape as part of the "Certified used" programme.

Buyers of used machines can rely on the quality and reliability of their Komptech machine, just like when buying a new one. The company processes used machines according to a defined process. Every step in this process – from initial inspection to reprocessing and final inspection – is subject to strict specifications.

After the initial inspection, the machine is disassembled. The components are then examined in detail. Above all, the individual gears, the engine and the hydraulics are examined meticulously. The final quality control is carried out at the end. OELCHECK all-inclusive analyses play an important role in this process. The "new" used machine must pass the entire process successfully, and the OELCHECK analyses must prove that the gears, engine and hydraulics are in perfect condition.

How a machine is reprocessed

- The machine is checked according to the manufacturer's checklist (route card). All components are carefully inspected.
- The engine is tested according to the CAT checklist by Zeppelin.
- Oil analyses are conducted over the entire period – for rental machines.
- Pressures in the hydraulic system are measured.
- The rotor is balanced (Axtor/Topturn machines).
- A test run is performed with material (Axtor).
- ➔ Final acceptance takes place according to new machine standards.

Only when there is no doubt about the quality of a used machine does Komptech grant a warranty for the renewed machine and label it with the "Komptech certified used" quality seal.

The operators of the new used machines:

- Maintain machines younger than six years and with less than 6,000 operating hours.
- Know that inspection, reprocessing and quality control were performed according to Komptech standards.
- Also benefit from a warranty of six months or 500 operating hours.

For further information: www.komptech.com



The Komptech Crambo is one of the best machines for shredding all types of wood and green cuttings. Two slow-running rollers with cutting tools minimise the fine content as well as noise and dust emissions and provide resistance to contaminants.



COME AND MEET US!

We will be exhibiting at the following trade fairs and conferences. Will you be there too? If so, we would be delighted if you could arrange a meeting with us in advance (sales@oelcheck.com) or drop by our stand!

TAE Technische Akademie Esslingen
Ihr Partner für Weiterbildung

23-25/01/2024 | 24th Tribology Colloquium



16-17/04/2024 | Stuttgart



17-19/09/2024 | Düsseldorf

BAVARIAN, RUSTIC AND COSY – THE 2023 CHRISTMAS PARTY



Christmas was just around the corner when we finally had time for our party together on 20th December. It only took a few minutes to get to the hiking car park above Bad Feilnbach by bus. From there, despite rain and wind, we walked up a forest path to Tregler Alm. Once we reached the top, we warmed up by a large brazier with mulled wine and punch. Then it was time for a three-course menu in the cosy rooms with live Bavarian music.

Saint Nicholas dropped by as a "surprise guest". He didn't read us the Levites, but from his golden book he presented some funny and also quirky events from everyday life.

After this wonderful evening in the rustic cabin at Tregler Alm, we got back down to the car park at 9:30 p.m. in the glow of our torches, where the bus was already waiting to take us back.

BACK TRAINING AND LOTS OF FUN

All OELCHECK employees have access to the company's own gym free of charge. To ensure that the sporting activities also achieve the desired success and that participants are always motivated, we offer fitness and prevention courses accompanied by trainers. In autumn 2023, special back training was resumed at the request of many employees. A strong and healthy back ultimately improves posture and prevents tension and pain. The importance of this is also reflected in the statistics that reveal back pain to be the most common reason for absence from work. Although the exercises are often quite strenuous, the participants are enthusiastic and see the personal benefits of this course.



➔ For us as an employer, the focus is on analytics, and the people take centre stage.

THANK YOU FOR YOUR LOYALTY AND COOPERATION

In 2023, we were able to thank three long-standing employees for their great work and long-time loyalty to OELCHECK.

■ Marcus Buchner – 10 years.

He was hired as controller in May 2013. Today, he is also responsible for the organisation of purchasing and warehouse management. In addition, he is our company data protection officer and the representative for company integration management (CIM).

■ Wolfgang Käsweber – 20 years.

Mr Käsweber celebrated his anniversary in March 2023. We already reported on this milestone in the spring issue.

■ Enrico from IT – 20 years.

As a software developer, he has been critically involved in the design, implementation and support of our application programs. This also includes our proprietary evaluation software, which was specially developed to support OELCHECK tribologists in the evaluation of samples, as well as the customer portal and the OELCHECK app.



OILDOC SEMINAR PROGRAMME

Current dates

16-18/01/24	Machine monitoring by means of oil analysis, for beginners *MLA I/MLT I certification course* *NEW*
06-08/02/24	Fundamentals of lubricant application I Module I in the "Certified Lubricant Expert" series. Can be booked individually.
20-22/02/24	Lubrication and oil monitoring for hydraulics
27-28/02/24	Lubrication and oil monitoring for paper machines
12-13/03/24	SYMPOSIUM: Deposits in lubrication and hydraulic systems
09-10/04/24	Fundamentals of lubricant application Module III in the "Certified Lubricant Expert" series. Can be booked individually.
23-25/04/24	Lubrication and oil monitoring for gears
07/05/24	Coolant – the underestimated operating fluid
13-16/05/24	Expert knowledge for lubricant professionals *CLS certificate course*
04-05/06/24	Certified hydraulic oil specialist *OilDoc Certificate Course* *NEW*
11-12/06/24	Damage to bearings, gears and motors – causes and solutions Module IV of the "Certified Lubricant Expert" series. Can be booked individually.
18-20/06/24	Lubrication and oil monitoring for turbines and turbo compressors
25-26/06/24	Lubrication and oil monitoring for combustion engines
02-04/07/24	Machine element lubricant – know-how for designers
08-11/07/24	Machine monitoring by means of oil analysis, advanced course *MLA II Certificate Course*
09-12/09/24	Lubrication for experts *CLS Certificate Course in English*
24-26/09/24	Fundamentals of lubricant application I Module I in the "Certified Lubricant Expert" series. Can be booked individually.
08-09/10/24	Lubrication and oil monitoring for stationary gas engines
05-06/11/24	Fundamentals of lubricant application II Module II in the "Certified Lubricant Expert" series. Can be booked individually.
12-13/11/24	Lubricating greases – properties, selection and monitoring

Your contact for further training:

OilDoc GmbH
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83098 Brannenburg
Tel. +49 8034 9047700
info@oildoc.de

All of the current dates, detailed seminar content and conditions of participation as well as the links to uncomplicated online registration can be found on our website:

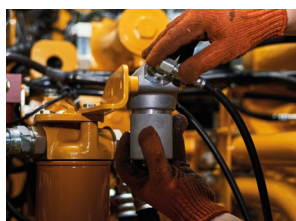
oildoc.com/seminare



HIGHLY QUALIFIED WITH OILDOC CERTIFICATE COURSES

Get one step ahead with an additional qualification! At the OilDoc Academy, you can acquire valuable specialist knowledge and document your achievements with **recognised certificates!**

In 2024, we will offer our well-known as well as new **certification courses**.



New OilDoc certification course: Certified Hydraulic Oil Specialist

04-05/06/2024

The new OilDoc certificate course gives you in-depth insight into the special requirements of modern hydraulic systems to ensure the economic and reliable operation of your hydraulic systems in the long term.

The course focuses on the appropriate selection of the optimal hydraulic fluid, taking into account the special system requirements of various applications. Specific, typical use cases reveal that the minimum requirements defined in accordance with the relevant DIN or ISO standards are not sufficient to operate modern systems economically and sustainably.

At the same time, your instructor Rüdiger Krethe will show you which parameters are particularly important when selecting oil in order to lay the foundation for reliable plant operation. Moreover, the course addresses the reliable adjustment of oil change intervals, early detection of wear and malfunctions, clarification of damage causes, the advantages of oil analysis and optimised oil care based on this for proactive maintenance.

On the afternoon of the last day of the seminar, you can take an official certificate exam. After successfully completing the multiple-choice online test, you will receive a high-quality certificate and will be entitled to use the official "Certified Hydraulic Oil Specialist" logo.





Lubrication – Fundamentals, Applications and In Practice

Optional: Certification as "Professional Lubricant Expert"

Acquire comprehensive fundamental and practical knowledge on lubrication and lubricants.

This course consists of four modules and is suitable for beginners and practitioners. You can join the course at any time. You can also book all four modules individually, of course, but it's certainly worth following all four units.

At the end of the training course, you will take a multiple-choice exam, receive a high-quality certificate after passing the test, and be able to use the official "**Professional Lubricant Consultant**" logo. The certificate documents your in-depth knowledge of lubrication and lubricants. More than 40 participants have already successfully completed the further training series in recent years.

Module 1: Fundamentals of lubricant application I
Module 2: Fundamentals of lubricant application II
Module 3: Professional lubricant management
Module 4: Preventing damage to bearings, gears and motors

06-08/02/2024 or 24-26/09/2024
05-06/11/2024
09-10/04/2024
11-12/06/2024

Book all modules and save €350!



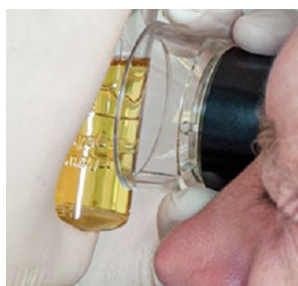
Machine monitoring by means of oil analysis ++ for beginners ++

16-18/01/2024: 3-day certification course for MLA I or MLT I certification

This new course not only covers the basics of lubricants, but also their professional application in the maintenance of machines and systems. Seminar leader Rüdiger Krethe guides you through the complex correlations between proper lubrication and the crucial role it plays in the smooth functioning and safety of machines. You will not only learn theoretical concepts, but will also be introduced to the practical methods and principles of lubricant monitoring in operation.

A highlight of this course is the **option of an official certification** by the International Council for Machinery Lubrication (ICML), which is recognised worldwide. Upon completion of the course, you will have the choice between two different certificates, depending on your field of work and experience:

- **MLA I (Machine Lubricant Analyst), Level I:** This qualification is aimed at persons with at least 12 months' experience in monitoring the state of machinery based on lubricant analyses.
- **MLT I (Machinery Lubrication Technician), Level I:** For participants with at least two years of practical experience in the areas of machine lubrication, mechanical engineering and/or maintenance.



Machine monitoring by means of oil analysis ++ advanced course ++

08-11/07/2024: 4-day certification course for MLA II certification

Used correctly, oil analyses adapt the oil-change intervals to individual conditions without risk, monitor the content of impurities and provide information about abnormal wear situations of lubricated components. Over four seminar days, we will provide you with an overview of the field of oil and grease analysis for machine and system monitoring. The entire field of expertise is covered: from technical application to lubricant, lubrication technology, monitoring of oils and machines, including sampling, assessment of laboratory values and sustainable oil care.

- **MLA II (Machine Lubricant Analyst), Level II:** The test requires at least 24 months (384 hours, spread over two years) of experience in the condition monitoring of machines based on lubricant analyses and at the same time possession of the certificate MLA I or at least 960 hours of experience and attendance of our MLA I course



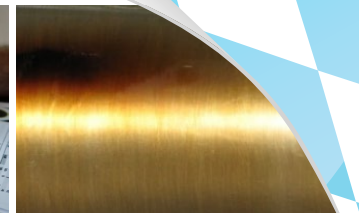
Expert knowledge for lubricant professionals

Certified Lubrication Specialist (CLS) certification

A Certified Lubrication Specialist (CLS) holds the most prestigious certificate on an international level in the lubrication industry. This means the holder has extensive knowledge of lubrication-related relationships as well as in-depth knowledge of lubricant applications.

Our proven Expert Knowledge for Lubricant Professionals course provides the ideal preparation for gaining the certificate. It goes far beyond the scope of traditional lubricant seminars and requires participants to have in-depth knowledge. The seminar offers an integrated presentation of the technical applications of lubricants and lubrication technology, as well as monitoring and oil maintenance.

13-16/05/2024 Certificate course "Expert Knowledge for Lubricant Professionals" (4 days)
09-12/09/2024 Certificate course "Lubrication for Experts" (4 days - **course language: English**)
Certification test via online portal on your preferred date.



Detecting, removing and proactively preventing deposits in lubrication and hydraulic systems

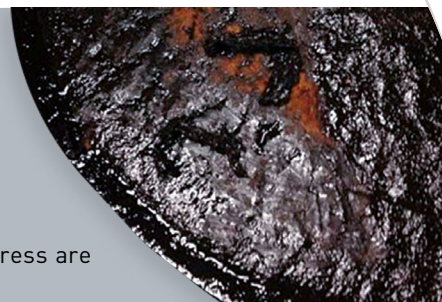
12/13 March 2024, Symposium at the OilDoc Academy, Brannenburg

System malfunctions caused by deposits can be noticed in many ways.

All oil-bearing systems that subject the lubricating or hydraulic oil to local or general thermal stress are equally affected. However, many plant operators are unaware of this creeping danger.

These typical problems indicate the presence of deposits:

- Initial isolated malfunctions in proportional or servo valves, with increasing frequency
- Sudden filter blockages – during operation or when restarting the system after downtime
- Unusual discoloration of the hydraulic or lubricating oil within a very short time
- Significantly changed operating behaviour of the system after connection of certain subsystems, e.g. pump groups, cooling circuits, etc.
- Failures of sensitive lubrication distributors in central lubrication systems
- Fluctuating bearing temperatures in circulating lubrication systems ("sawtooth pattern") despite stationary operating conditions



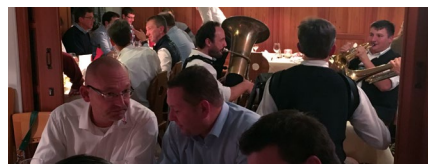
In our two-day symposium, we will provide you with information about the background to these phenomena and how to avoid, identify or eliminate them. To this end, we have invited experts from precisely these specialist areas: from oil manufacturers and service laboratories to oil care experts and service companies who specialise in precisely this field and want to share their experiences with you.

You can look forward to these speakers, among others:

- Jo Ameye, FLUITEC B.V.
- Carsten Heine, OELCHECK GmbH
- Ulrich Hielscher, International Academy of Hydraulics
- Rüdiger Kretze, OilDoc GmbH
- Richard Linz, Braun Fluid-Service GmbH
- Benedikt Fuchs, OELCHECK GmbH
- Dr Olaf Schmidt, Karberg & Hennemann GmbH

Goals:

- Identify specific oil requirements of modern hydraulic and lubrication systems in specific applications
- Understand the background and mechanisms of deposit formation in hydraulic and lubricating oil systems
- Objectively select the optimal hydraulic fluid or lubricating oil for economical and reliable plant operation
- Use a professional oil condition monitoring concept with a focus on the early detection of a tendency towards increased oil deposits
- Apply specific concepts for oil and system cleaning, in particular with regard to ageing-related deposits and their use for proactive prevention



First-class networking

During the breaks and at our Bavarian evening with a traditional three-course menu, there is plenty of opportunity to exchange experiences and network.

Take a look behind the scenes...

Take advantage of this opportunity to visit the OELCHECK GmbH laboratory, Europe's leading laboratory in lubricant analysis. It is equipped with state-of-the-art equipment used for analysis technology. Many testing devices were developed in collaboration with the manufacturers and have been tailored to meet specific requirements which are essential for testing lubricants.

Highly qualified chemists and laboratory technicians operate the large variety of analysis equipment and examine up to 2,000 lubricant and fuel samples every day.



Information and registration at www.oildoc.de/ablagerungs-symposium/



OUR ADVANTAGES AT A GLANCE



Quality



Speed



Expertise



Experience



Customer focus



Innovation



Individuality



Independence



All-in-one analysis kit



International

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