



Summer 2023

OELCHECKER



HOT TOPIC

Digitalisation and lubricant analysis

PARTNER FORUM

- Schaper emergency power systems
- WESTO oil maintenance

OELCHECK INSIDE

UmweltCluster Bavaria, excursions, summer campaigns, visitors and more.

AND MUCH MORE...



75 ISSUES IN 25 YEARS!

OELCHECKER IS CELEBRATING ITS BIRTHDAY!

In the summer of 1998, our magazine for experts was published for the first time. Our company was just seven years old. When it came to lubricant analysis, we had already taken on the decisive pioneering role. However, information that was easy to understand concerning tribology and the possibilities of oil analysis was lacking in German-speaking countries. There were so many exciting topics at the time, we decided to create our own magazine for our customers.

The name "OELCHECKER" was clear from the start. Our customers then had the first edition in their hands in the summer of 1998. Eight pages, packed with information, three times a year. Today, this number of pages has long been insufficient. Finally, we now offer all-inclusive analyses, not only for lubricants, but also for fuels, AdBlue and coolant. Although OELCHECKER has become increasingly extensive, the exciting mix of four topics has remained the same.

With the launch of the e-paper, we have also modernised the layout of our customer magazine. There is no longer a restriction to eight pages. The design has become much more spacious and, at the same time, clearer.

But one thing hasn't changed, even after 25 years: Almost all editorial content and the layout of OELCHECKER are created in-house. Sometimes it is not so easy to select the most important topics from the wide range of possible topics for our customers and then to prepare the content in such a way that the readers get as much as possible out of it.

By the way, all editions of OELCHECKER are available to read in the download area under the Service button at oelcheck.de. They provide information, training and entertainment! Including this issue, there are a total of 75 issues of our customer magazine available. Many more will follow!

- In **Technology Focus**, OELCHECK tribologists discuss the latest tribology and analytics topics.
- In **Partner Forum**, we present customers and how they benefit from our analyses.
- **Insider Info** presents the latest developments in the OELCHECK laboratory and our latest services. It also provides insights into our company and the cooperation that is practised by the OELCHECK team.
- In the **Q&A** section, we answer a wide range of questions sent in by our customers.

At the end of 2021, the German-language edition of our magazine reached a print run of 10,500! This was a pleasing sign that confirms the enormous popularity of OELCHECKER. However, a downside was the enormous paper consumption for the 31,500 printed copies per year plus the large number of mailing bags for mailing. The OELCHECK laboratory has already been working without paper. Now our customer magazine has followed this trend in the spirit of using resources responsibly.

Since spring 2022, the German and English editions of OELCHECKER have (almost) only been sent digitally by e-mail. In this way, we reduce the consumption of paper and avoid unnecessary CO₂ emissions when sending mail.



Your 2023 editorial team (from left to right): Peter Weismann | Stefan Mitterer | Paul Weismann | Astrid Hackländer | Petra Bots | Barbara Weismann | (not pictured) Dr. Christoph Rohbogner

CONTENTS

- **HOT TOPIC**
Digitalisation and lubricant analysis – a perfect combination 3-4
- **Q&A**
Lubricant analyses – For more sustainability and CO₂ savings in industry..... 5-6
- **OELCHECK INSIDE**
Verband Schmierstoff-Industrie e.V. – TSA Spring Conference in Brannenburg 6
OELCHECK Team – Tour of the Gunvor refinery/Summer lunch break 6
Young visitors – Preschool children check in on the OELCHECK bees 7
OELCHECK – New member of Umweltcluster Bayern..... 7
Top on Mountain – Football for a good cause..... 7
Trade fairs and events 2023 – Meet us here 9
Top prospects – Training at OELCHECK 11
- **OELCHECK TECHNOLOGY FOCUS**
Lubricating greases – Optimised determination of wear and additive elements 8-9
- **OELCHECK PARTNER FORUM**
Schaper Emergency Power Systems – Insurance in case of emergency..... 10-11
SOS Varnish! – WESTO gets hydraulic and turbine oils back into shape 12-13
- **OILDOC NEWS**
Current seminar programme 14
Ray Thibault Award for Rüdiger Krethe 15
Review: OilDoc Conference 15
Customised company seminars..... 15

Published by:
OELCHECK GmbH Kerschelweg 28 · 83098 Brannenburg · Germany info@oelcheck.de · www.oelcheck.de

Concept and text: OELCHECK GmbH · Astrid Hackländer

Typesetting and design: Agentur Segel Setzen, Petra Bots, www.segel-setzen.com

Image rights:
OELCHECK GmbH · OilDoc GmbH · AdobeStock

© 2023 OELCHECK GmbH
All rights reserved.
Reproduction only permitted after approval!

DIGITALISATION AND LUBRICANT ANALYSIS

A PERFECT COMBINATION

More and more knowledge is being stored digitally. We have stored the results of approx. 5 million tested lubricant and operating fluid samples in the large OELCHECK database alone and thus have access to approx. 190 million individual values. And more are being added all the time. Every day, we receive, process and send an enormous amount of data. Digitalisation has been part of our workflow for some time already. This is the only way we can manage the flood of data and provide our customers with a host of smart service tools for data exchange, such as the OELCHECK APP 4.0, the LAB.REPORT customer portal, FTP server or API interfaces. Powerful IT systems do the rest. Various software systems prepare the analysis data for the OELCHECK tribologists and ultimately for the customers in order to make use of the flood of data, to make correlations clear and to be able to make statements. Our lubricant and service product analyses have contributed to the sustainable operation of companies for over 30 years by determining condition-dependent oil changes and evaluating trend analyses. But in the age of digitalisation, lubricant analytics can make an even more efficient contribution to maintenance and servicing.

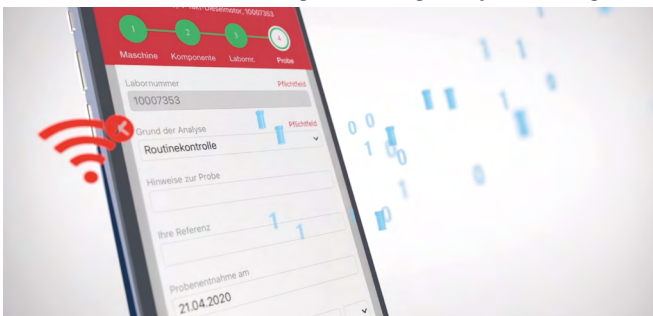
Stefan Mitterer Managing
Director Technology, Service
& Sales



Two-way data exchange

Collecting data is not difficult. But it's not about collecting as much data as possible, but rather the relevant data. And this is where the human factor comes into play! OELCHECK supports customers with well-thought-out Sample Information Forms in order to obtain truly meaningful information. They focus on the essential information, are optimally structured and ask industry-specific questions. In the customer's own interest, these should be answered carefully and in full. The more relevant information the OELCHECK tribologists have available, the more detailed and meaningful their diagnoses can be.

Sending, receiving and processing data



Correct transmission of the information to the OELCHECK laboratory is essential. Electronic data transfer of the Sample Information Forms via the OELCHECK APP 4.0 (with or without the use of QR codes) or the OELCHECK customer portal as well as a possible data import via an API interface offers many advantages:

- The key data concerning the lubricant and the machine are stored once and are then always available. Only the variable data of the current oil sample (e.g. oil service life) has to be added.
- This significantly reduces data entry errors.
- No more ambiguities and questions due to illegible handwriting.
- Mandatory input fields ensure that the customer submits all of

the important information.

- Data can be checked for plausibility if, for example, an oil service life has been specified that is longer than the total life span of the machine.
- Automatic assignment of the data to the component or machine from which the sample originates.

→ Electronic data transmission to the OELCHECK laboratory is simple, secure, fast and efficient.

After completing the examination of a sample in the laboratory, OELCHECK returns the laboratory report with its data to the customer. Again, there are various options available for this:

- By e-mail as a PDF file.
- By means of a data export in various formats via the OELCHECK customer portal.
- Saved on an FTP server for retrieval.
- Direct transfer to the customer system via an API interface.

If a customer only needs the laboratory reports of individual samples, they can still be sent in printed form by post or as a PDF file by e-mail. However, each laboratory report contains up to 40 individual values. A figure that quickly adds up in the case of multiple samples. The sending of a larger number of laboratory reports and, above all, the preparation of the data at the customer's premises can only be achieved with digital support. Specially set-up options for data export or linking the customer's IT systems with those of OELCHECK come into play.

With a data export, the analysis results can be transferred into the desired form and thus directly imported into the customer's software and processed. The data can be exported to the OELCHECK LAB.REPORT web portal by the customer. Alternatively, OELCHECK can set up an automated export to the customer. This is done by providing the analytics data on an FTP server or transmitting it via an API interface.

FTP stands for "File Transfer Protocol", a communication protocol that regulates the conditions under which different IT systems can communicate with each other. In this way, the analysis data from the OELCHECK laboratory is made available to the customer at a defined time, who can collect it and process it accordingly.



Even more elegant is the direct connection of the customer's systems with those of the OELCHECK laboratory using a specially programmed API (Application Programming Interface). This makes it possible to exchange data in a standardised manner. The transfer of data and commands is structured according to a previously defined syntax. The customer can access all their data and analysis results at any time. In addition to current analysis data, analyses from the history can also be used, as the interface allows a permanent and continuous exchange of information.

➔ **An API interface represents the optimal option for data transfer in both directions. The data from the complete OELCHECK analyses are automatically imported into the customer's maintenance program. This means that they can derive the maximum benefit for the sustainable use of their lubricants and machines.**

Big data used in a smart way by OELCHECK

Even in the age of digitalisation, the monitoring of lubricants and thus systems and machines is the central task of lubricant analytics. However, more is expected of lubricant analytics today than just the assessment of individual samples and related trends. In order to be able to handle increasingly diverse tasks, it needs the support

of digitalisation. As part of a big data analysis, such as the type OELCHECK carries out, a large number of analysed samples are used to uncover hidden patterns, previously unknown correlations and other useful information for the customer.

Thanks to such queries, OELCHECK tribologists don't just have access to the parameters determined during the analyses. If a large number of laboratory reports are available for a customer, the analysis of these data sets opens up a much more comprehensive view of the available data material.

In the past, it was not feasible to be able to make a statement on some complex relationships. Nowadays, however, it is possible to carry out evaluations for customers when questions arise, such as:

- A customer has received lab reports with a red exclamation mark indicating an urgent need for action. What values were the reason for this? What can be deduced from this?
- Are the analysis values of a lubricant identical for several identical machines with different load profiles? If there are differences, where and why do they occur?
- A company operates its machinery at different locations or in numerous countries. Why do regional deviations in the analysis values occur with identical machines?
- How often did a customer have oil changes carried out, even though they were unnecessary?
- On which machines / how many machines has no oil change been carried out despite being ordered by the service manager?

Digitalisation and its possibilities are the perfect complement to lubricant analysis. IT not only allows the storage, processing and rapid transmission of large amounts of data, but also enables the linking of IT systems and thus the immediate implementation of analysis data in the maintenance programs of OELCHECK customers. In addition, digitalisation is essential for the OELCHECK laboratory information and management system (LIMS). With its wide range of programs, it supports and controls all procedures and processes as part of every investigation of a lubricant or fuel. But even though we use the possibilities of digitalisation in a smart way, it is only OELCHECK tribologists who can ultimately use their expertise to evaluate analysis results and answer far-reaching questions.





? OELCHECK LUBRICANT ANALYSES – THEIR IMPACT ON SUSTAINABILITY AND CO₂ SAVINGS IN INDUSTRY

Thanks to OELCHECK lubricant analyses, we only change the majority of our oils based on their condition. As a result, we have saved many tonnes of fresh oil over the years, drastically decreased the amount of used oil and significantly reduced the ecological footprint of our operations. We operate sustainably! But in the bigger picture, our company is just a small piece of the puzzle. What does it look like on a macroeconomic level? Do you know what quantities of lubricants have been saved in industry so far thanks to analyses? And what impact this has had on CO₂ emissions?

✓ Answering this question was a real challenge! Official figures are not available and, of course, we can only access our own data. However, the question has also interested us so much that we have delved deeper into the matter.

Pure waste

Since our company was founded in 1991, we have tested more than 5 million samples of used lubricants alone. For a large proportion of these samples, all of the values we examined were in the green range. In other words, the lubricants could actually continue to be used. However, we then carried out a check of the samples that customers had taken directly before an oil change based on their information. These customers had not waited for the laboratory results, but had already changed the oil prophylactically.

The results of our retrospective analysis were clear: For 25% of these samples, the values were all in the green range! The lubricants did not need to be changed!

With an average filling capacity (across all applications) of around 330 litres and an average oil service life of around 1,000 operating hours, around 120,000 tonnes of oil were changed too early and thus wasted.

In most of these cases, it is generally assumed that a 50% extension of the oil service life is realistic. However, even an extension of approx. 20% of the oil service life would have resulted in enormous savings in terms of costs and CO₂.

It's time to rethink!

Changing high-performance lubricants early means wasting valuable resources and increasing CO₂ emissions needlessly!

Lubricants play a crucial role in industry as they reduce friction and wear in machinery and equipment. They ensure trouble-free operation and extend the service life of the equipment. At the same time, however, lubricants are associated with CO₂ emissions resulting from their manufacturing process, transport and disposal. Consequently, the aim must be to make the consumption of lubricants as efficient and long-lasting as possible.

Lubricant analytics is an ideal way to monitor the condition of lubricants in machines and the machines themselves, and to optimise operations. Regular analysis can identify potential problems such as oxidation, contamination and the wear of lubricated components early. Analytics enable targeted maintenance and determine the exact time to replace lubricants in order to ensure optimal performance. For this reason, many well-known equipment manufacturers link the oil service life to an accompanying oil analysis. For example, a major manufacturer of construction machinery permits a change interval of 2,000 operating hours if the machine is accompanied by oil analyses. Otherwise an oil change interval of 500 operating hours is specified.



However, another aspect of lubricant analysis must not be forgotten. The analytics also have a decisive influence on the reduction of CO₂:

- **Extended oil-change intervals:**
By monitoring the condition of the lubricant and replacing it in a targeted manner, the service life of the lubricants can be extended. This reduces the need for refills, any amounts of flushing oils and oil filters, and thus reduces the CO₂ emissions associated with the production and disposal of lubricants.
- **Reduced energy consumption:**
Efficient lubrication results in less friction loss in machinery. This enables energy savings and reduces the CO₂ emissions associated with energy production.
- **Prevention of unplanned downtime:**
By identifying problems early, lubricant analysis can reduce unplanned machine downtime and extend the lifetime of components and equipment. This also results in significant savings in terms of energy and CO₂.

The positive influence of lubricant analysis on CO₂ reduction is significant and varied. Some important aspects illustrate their contribution to this:

- Regular lubricant analyses and the targeted monitoring of the lubricant condition can reduce the need for refills. This leads to a reduction in CO₂ emissions associated with the manufacturing, transportation and disposal of lubricants.
- Targeted maintenance based on the results of the lubricant analysis makes it possible to use the lubricant for longer without compromising the performance or operational safety of the machines. This reduces the need for regular lubricant changes, which in turn reduces CO₂ emissions.
- Lubricant analysis enables problems such as wear, contamination or oxidation to be detected at an early stage. Correcting these problems in good time and using the right lubricants leads to improved machine efficiency. More efficient machines consume less energy, which leads to a reduction in CO₂ emissions.

- Lubricant analysis enables proactive and preventive maintenance. By detecting problems early, maintenance can be planned and unplanned downtime is minimised. As a result, in addition to an unnecessary oil change, there is also no need to dispose of components, some of which would have also been replaced at fixed intervals. This not only increases productivity, but also reduces resource consumption and associated CO₂ emissions.
- By implementing lubricant analyses for CO₂ reduction, a company demonstrates its commitment to environmental protection and sustainability. This can improve the company's image and contribute to stronger customer loyalty.

→ **Conclusion:** Lubricant analysis is an effective instrument for CO₂ reduction in industry. By optimising the consumption of lubricants, extending the usage intervals of lubricants, increasing machine efficiency and avoiding breakdowns, it makes a significant contribution to reducing CO₂ emissions and, in doing so, supports companies on their way to a more sustainable future.



OELCHECK also answers your questions on the topics of lubricant and operating materials analyses and tribology. Contact us by email (info@oelcheck.de) or fax +49 8034 9047-47.



VERBAND SCHMIERSTOFF-INDUSTRIE E. V. MET AT OELCHECK

Verband Schmierstoff-Industrie e. V. (VSI) is an association comprising all of the major manufacturers of automotive and industrial lubricants in Germany. With Technical Expert Committees (TSA) and working groups, the VSI offers a permanent exchange of technical information and common positions. With more than 80 member companies, the association represents more than 90% of the German lubricant industry.

In addition to large, multinational oil corporations, many medium-sized companies are also members. OELCHECK has been a member of the association since 2013 and this year hosted the large TSA spring conference in Brannenburg.

To kick off the event, the participants met in the evening for a get-together in Rosenheim. The following day then started with an introduction to our company. The topic of the lecture was "Why does oil analysis help to optimise your sustainability?". This was one of the hottest topics that is the focus of all members of the association. At the end of the conference, a guided tour of the OELCHECK laboratory was on the agenda.

OELCHECK VISITS THE GUNVOR REFINERY IN INGOLSTADT

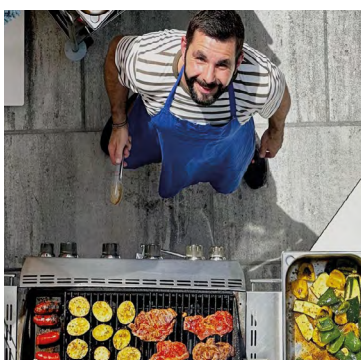
Experience technology up close! True to this motto, we regularly carry out excursions in order to train our employees. In May 2023, some of OELCHECK's tribologists and employees from the sales department visited Gunvor Refinery in Ingolstadt. As one of the most powerful refineries in Europe, it has been supplying southern Germany with products for mobility and heat for over five decades. It also supplies products for use in the chemical industry as well as district heating for the region.

During the extensive tour of the site, OELCHECK employees were able to learn about the production processes of a refinery in a practical manner.



© Wikimedia

The refinery's maintenance manager was there in person and used the OELCHECK team's visit for an in-depth discussion about monitoring lubricants with all-inclusive OELCHECK analyses. Among other things, the focus was on turbine oils. These tend to form varnishes, which in turn can lead to valve sticking and malfunctions of the systems. Therefore, there was intensive discussion about the preventative possibilities of oil analysis and about the prevention or removal of varnish.



SUMMER, SUN, BARBECUE BUFFET

Almost everyone dreams of such lunch breaks! In June, the OELCHECK team had its first big barbecue buffet this year on the terrace of our cafeteria. The delicious scent alone promised a very special culinary delight. In addition to grilled pork neck steaks, sausages, grilled cheese and vegetables, baked potatoes, a refreshing herb dip and other homemade sauces awaited us.

After this special lunch break, we all agreed: on beautiful summer days, we will be barbecuing again!



YOUNG VISITORS TO THE OELCHECK BEES

OELCHECK's bees are doing magnificently! The preschool children from St. Johannes kindergarten in Brannenburg were personally convinced of this. A year ago, they painted the beehive with an organic-certified coloured wood stain. It is located in the middle of a newly created flowering meadow on the 1,000 m² green strip of the employee car park on Blumenstraße. Now, the children wanted to see how well the bees liked their home.

Michael Linnerer, Head of the OELCHECK IT department, is responsible for the bee colony. In his free time, he is a hobby beekeeper and was able to tell the young visitors from the kindergarten a lot. First of all, he demonstrated his beekeeper tools and protective clothing. With the help of glass panels, it was then possible to safely admire two showcases with the workers and the queen of the bee colony. A special highlight was the birth of a female worker bee, as she ate her way out of a cell.



After a wealth of experiences, they then went to the OELCHECK cafeteria. Here, the little explorers were able to enjoy fresh fruit, vegetable sticks, drinks and, of course, the delicious sweet honey of OELCHECK's bees.

We look forward to seeing them on their next visit!

NEW MEMBER OF UMWELTCLUSTER BAYERN

Umweltcluster Bayern is the network of the Bavarian environmental economy. It networks companies and service providers, science and research, municipalities and associations, policy-makers and chambers of trade and industry from Bavaria, Germany and the world. Umweltcluster Bayern has over 200 members and works together with numerous other partners. The aim of networking is to strengthen and expand the Bavarian economy as well as small and medium-sized enterprises.

The network covers the entire value chain related to environmental industries and bundles expertise from the following areas:

- Waste and recycling
- Alternative energy generation
- Soil and contaminated site remediation
- Air pollution control
- Resource efficiency & material flow management
- Water and wastewater.



© UmweltCluster Bayern

Like OELCHECK GmbH, members of Umweltcluster Bayern make a significant contribution to protecting our environment with innovative projects. Through our lubricant and operating fluid analyses, we have been actively contributing to the efficient use of resources for over 30 years and are therefore predestined for membership of Umweltcluster. Shortly after a personal meeting with our company founder and Advisory Board member, Peter Weismann as well as Managing Director, Paul Weismann, the board of directors of the supporting association 'Umwelttechnologie-Cluster Bayern e.V.' passed a positive resolution: OELCHECK has been an official member of Umweltcluster Bayern since April 2023.

FOOTBALL EXTRAVAGANZA FOR A GOOD CAUSE

Peak Performer versus Bananenflanker! On Saturday, 15 July, two celebrity teams competed against each other in the big charity game at the Brannenburg sports park and during the half-time break, two teams of children with disabilities from Munich and Regensburg also competed. Although 35°C was measured in the shade on the day of the match, the teams still gave it their all.

The celebrities included: Matthias Steiner, the weight-lifting Olympic champion, biathlete Andi Birnbacher, comedian Luke Mockridge and football players such as Stefan Kießling, Jens Nowotny, Hanno Balitsch, Jens Lehmann, Benny Lauth, Gonzalo Castro Montilla, Sidney Sam and ex-professionals Sven Bender and Lars Bender from Brannenburg. 15 goals were scored, with the banana flankers emerging victorious with eight of them.

During the half-time break, the two children's teams competed against each other. They were proud to have walked onto the pitch with the celebrities and were almost unstoppable during the football match. Over 1,000 spectators of all ages cheered them on with every goal.



But the football festival didn't stop at the final whistle. In the evening, after the match, players, sponsors and VIP spectators met for a big auction. The auction raised more than €10,000. The proceeds of the football extravaganza went to the outpatient children's hospice in Munich. OELCHECK was one of the main sponsors of the event and supported the tournament with €6,000. OELCHECK Managing Director Paul Weismann and many employees from the OELCHECK team were there on the day.



OELCHECK has five ICP spectrometers from Spectro Ametek – they are used after the digestion of a grease sample using one of the new microwave devices. When determining up to 22 wear and additive elements in accordance with DIN EN ISO 11885, things get hot. At approx. 8,000°C, argon plasma supplies the energy to stimulate the individual elements.

LUBRICATING GREASES

OELCHECK OPTIMISES THE DETERMINATION OF WEAR AND ADDITIVE ELEMENTS

OELCHECK is one of the few laboratories around the world that analyses lubricating greases. As is the case with lubricating oils, determining the wear and additive elements contained in them plays an important role in the examination process. However, unlike lubricant or operating fluid analysis, there are no internationally applicable standards for carrying out grease analyses. The laboratories therefore use different, often in-house developed, non-validated test procedures, the results of which may differ.

Dr Christoph Rohbogner
Head of Tribology



An unsatisfactory situation that requires more clarity! That's why, using the three most common methods, we took the initiative to analyse over 100 samples of a wide range of used greases.

Three methods in comparison

These methods tested by us are predominantly used when analysing wear and/or additive elements from lubricating greases:

- **ICP-OES** – Inductively coupled plasma optical emission spectrometry
- **RDE-OES** – Optical emission spectrometry based on the rotrode method
- **XRF** – X-ray fluorescence analysis.

All methods energise the sample and thus stimulate the elements. In X-ray fluorescence (XRF), this occurs through X-ray radiation. In the case of the rotrode method, it occurs through the discharging of a spark and in the case of ICP-OES by means of an argon plasma that is approx. 8,000 °C. The elements only remain in the corresponding state for the moment when stimulus occurs. On returning to the so-called basic state, this energy is emitted by the elements in the form of light. Each element has a unique, characteristic line spectrum. Iron can therefore be clearly distinguished from aluminium. The intensity of the light correlates directly with the concentration of the element in terms of quantity. By calibrating the instrument, the concentration can be determined very accurately.

RDE-OES and XRF with weak points

Oils are homogeneous mixtures that can be easily analysed directly or after prior dilution. Greases are rarely suitable for this due to their composition. In order for a grease to become a grease, a thickener is added. This ensures that the lubricant remains stationary and that it only releases the bound oil under the intended conditions.

Lithium, calcium, sodium or aluminium soaps are predominantly used as thickeners. These compounds with inorganic content can be an obstacle to the analysis as they cannot be dissolved in organic solvents. Organic thickeners, often known as polyureas, are also used. But these are also not readily soluble in organic media.

To overcome this hurdle, a method can be used that does not require dilution with an organic solvent, e.g. XRF or RDE-OES. They can be used to examine greases directly.

However, there are a few things to consider with these two methods.



- XRF is not suitable for detecting so-called “light” elements, such as lithium. This is a significant disadvantage if a grease is to be examined with a lithium soap or if a mixture with lithium soap is to be detected. In addition, accurate matrix compensation has to be performed in the case of XRF. It must therefore be known exactly how the grease is composed so that any associated influences can be subtracted out. Otherwise, the results might be too high or too low. Knowledge of the exact composition is extremely rare in the analysis of used grease. Although we have the data for most new greases, in the case of individual use, the thickener of the grease changes and with it also the dropping point and its flow behaviour.
- The RDE-OES works with a “spark wheel” and a graphite electrode. The grease is applied directly and heated to over 8,000 °C in an electric arc ignited at approx. 40,000 volts. The energy added in the form of temperature stimulates the elements and causes each element present to emit light in a characteristic wavelength. However, the coating thickness of the sample applied to the spark wheel must be precisely adjusted using a gauge. However, lubricating greases often contain large abrasion particles, which can cause very large amounts of light in the spark range of the RDE-OES, leading to higher than expected findings, which in turn also affects other elements. In addition, the burning off of the grease layer on the spark wheel changes the composition and the so-called blank value. This can also result in impairments of the findings.



New to the OELCHECK laboratory – two powerful Multiwave 5000 microwave devices from Anton Paar. 20 grease samples are placed on a rotor disc. The microwave devices each require 90 minutes plus 30 minutes cooling time to digest the samples.

The advantages of this approach are obvious:

- All confounding factors, such as inhomogeneity of the sample and influences from mixtures or background effects, are eliminated.
- This clears the way for measurement in accordance with DIN EN ISO 11885, an internationally recognised standard. This procedure describes the determination of elements in aqueous solutions using ICP-OES. This allows very low detection limits, sometimes in the ppb range (“parts per billion”).
- Another advantage is the significantly lower sample size. An XRF analysis, for example, requires at least 50 g of used grease. A quantity that is often very difficult or, in some cases, impossible to remove from a bearing. ICP-OES, on the other hand, requires a significantly lower quantity. After digestion with the microwave, it only needs 0.5 g for the complete examination!

ICP-OES and microwave digestion: a compelling combination

In order to obtain reliable values for the wear and additive elements in a grease sample, possible confounding factors should be eliminated before the values are determined. This affects the matrix and therefore especially the thickener of the grease. You first have to get rid of it in order to create a clear and haze-free solution. The chemist calls this method “digestion”. This is typically done by adding a strong acid and simultaneously heating it. Today, this is achieved with the help of modern laboratory microwaves. The result is a clear, aqueous solution that can then be easily analysed using ICP-OES, inductively coupled plasma optical emission spectrometry.

Conclusion for our laboratory

All of the procedures which have been described deliver actionable results within their system limits. After a comprehensive comparison of the three most common methods for the determination of wear and additive elements in lubricating greases, we have decided to use ICP-OES analysis in our laboratory instead of RDE-OES as before, following prior digestion of the samples using microwaves. This method fits well into our laboratory routine and the lower detection limits allow an even more precise assessment of the greases and the condition of the components they lubricate.



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 booth!



25-27/09/2023 | Tribological symposium



12-15/09/2023 | Husum



26-28/09/2023 | Essen



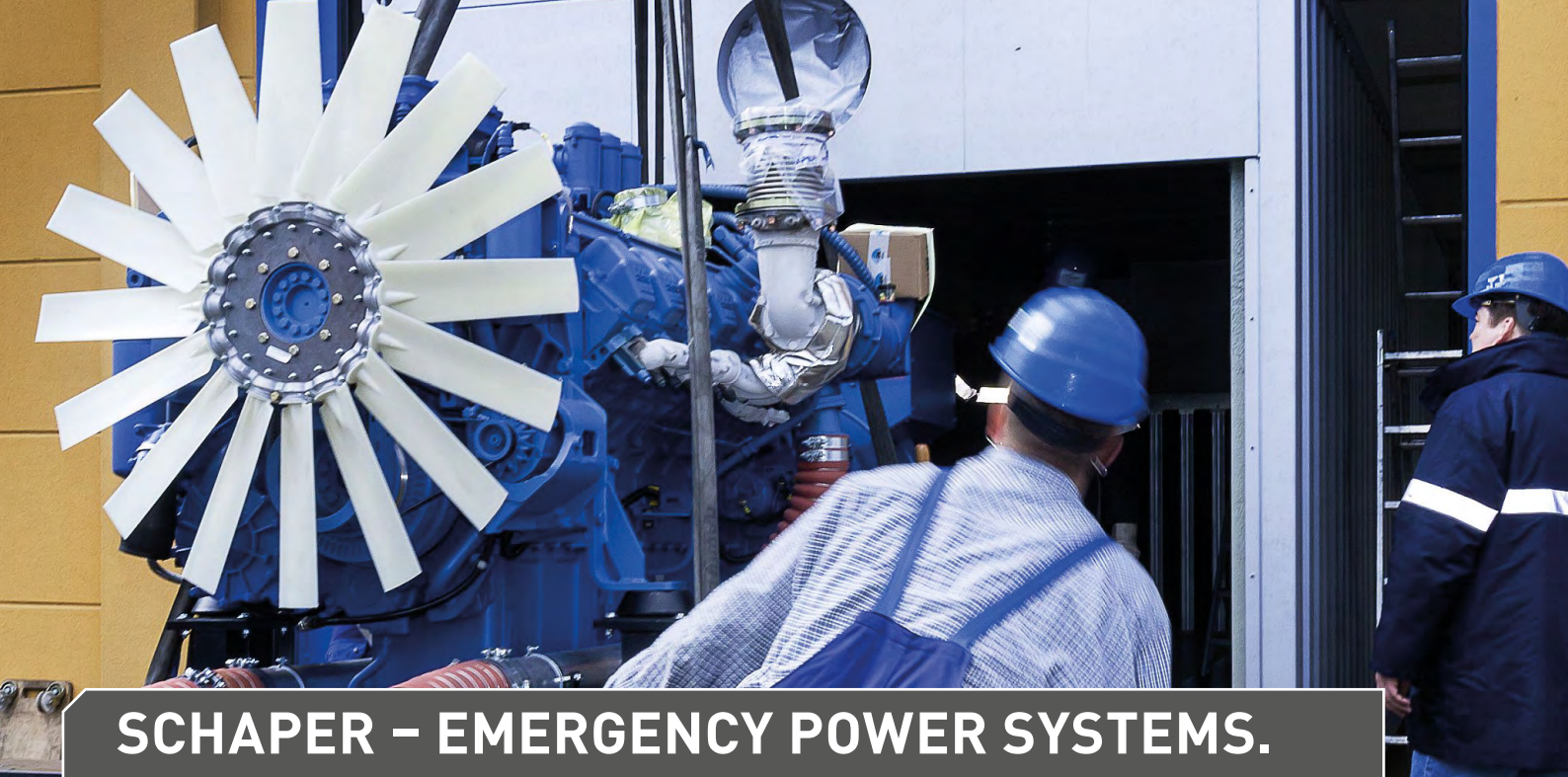
08-10/11/2023 | Potsdam



03-07/12/2023 | New Orleans, LA – USA



24-27/09/2024 | Berlin



SCHAPER – EMERGENCY POWER SYSTEMS.

INSURANCE IN THE EVENT OF AN EMERGENCY.

With its reliance on constantly available energy, our high-tech world is highly vulnerable. There doesn't even have to be a major blackout for this to become clear to us. Even a fire in a single transformer from an energy supplier can cause a power outage in an entire city. While private households will no longer be able to do anything, operations will continue in many systemically important facilities and companies. This is ensured by high-performance emergency power systems and Friedrich Schaper Notstrom- und BHKW-Technik GmbH.

Friedrich Schaper Notstrom- und BHKW-Technik GmbH has been designing and constructing emergency power systems for more than 60 years. Reliability, safety, cost efficiency and the sustainable operation of these emergency power systems (NEA) are of paramount importance. As far as the service is concerned, the name of the company's website, www.schaper24.de, says it all. Customer service is available around the clock and can help with problems as quickly as possible. The comprehensive range of services extends from the installation of small spare parts to immediate repair in the event of a fault to comprehensive motor overhaul.

Schaper installs and maintains emergency power equipment in hospitals and care facilities, fire and police stations, data centres, banks and insurance companies, utilities and many industrial companies.

Schaper's expertise in emergency power technology lies in maintenance-friendly design and the ready-to-use installation of stationary systems as well as flexible container solutions. Only high-quality, coordinated individual components are used.

The heart of an emergency power system is usually a generator driven by a diesel engine. If the power fails, a maximum of 15 seconds will pass before the emergency power system starts. During this time, powerful batteries take over the power supply. The emergency power supply and battery system work together to ensure an uninterruptible power supply (UPS).

Schaper only equips standby power supply systems with engines from well-known manufacturers, such as MTU or Volvo. While the smallest have an output of 50 kW, large motors, such as those used in emergency power systems in hospitals or energy companies which support the power supply, reach up to 2,000 kW. Whether small or large, the motors are almost always supplied with an engine oil based on SAE 15W-40 synthetic technology. Schaper

recommends the product because it has a wide range of approvals from leading motor manufacturers, is available worldwide and has proven itself to be very effective. Depending on the motor, 5 to 200 litres are used in a major assembly.

Maintenance, tests and oil analyses

Regular maintenance and servicing are essential for the safe and reliable functioning of any standby power supply system. Therefore, legal requirements must be complied with, not only during construction, but also during maintenance. These are the basic requirements. But in an emergency, the quality of professional support for a standby power supply system determines its operational readiness and thus the rapid availability of emergency power.

The operators of emergency power supply systems generally carry out one-hour trial runs with a partial load of 50% at monthly intervals. In addition, the Schaper service technicians subject the systems to a comprehensive inspection once a year, as part of the maintenance contracts. Among other things, the engines are checked for functionality under full load and samples of the engine oil are routinely taken for analysis by OELCHECK. The motors of an emergency power system are subject to different demands than those of motor vehicles. This is an important fact that OELCHECK takes into account when investigating engine oils. All relevant parameters are analysed in the OELCHECK laboratory and then commented on accordingly. This includes, for example, contamination of the oil with diesel fuel from the combustion process. As with a passenger car engine, which is only occasionally subjected to a cold start and then only runs for a short time, increased ingress of fuel can occur in the engine oil. This reduces the viscosity and thus impairs the lubricity of the oil. In the laboratory, the percentage of fuel in the oil is therefore determined using a gas chromatographic method.

In addition, not every standby power supply system can work under the ideal conditions of a protected environment. In such cases, for example, contamination that is due to the ingress of dust from the environment can be proven in OELCHECK's laboratory report. Corresponding information that is written by OELCHECK tribologists in the laboratory report concerning any impurities or other abnormalities in the analysis values help Schaper's service employees take short-term measures.

The benefit of doing without

In theory, the engine oil of an emergency power system should be changed once a year. A safety factor – but does it really make sense? With the extremely short running times of the motors, which generally only work in test mode, the oils are subjected to a correspondingly low load. In addition, this frequent change thwarts efforts to operate sustainably. Schaper consistently accompanies the use of engine oils with all-inclusive analyses from OELCHECK. Monitored in this way, the intervals between oil changes can be safely extended to up to four years.



Schaper24.de: Advice and service around the clock.

Dietmar Schaper, like his brother Rainer Schaper, is a Managing Director of the company: "Instead of three oil changes in four years, we only carry out one. A large system with an oil volume of 200 litres saves 600 litres or three barrels of engine oil. Of course, this approach has a negative impact on our sales and revenues. But the profit in terms of sustainability is enormous. OELCHECK's laboratory reports perfectly document the condition and development of all lubricant parameters, both for customers and us. At the same time, they provide information concerning any weak points in the system. This type of documentation also ensures security and trust for our customers!"



Top tip: Things to note about diesel fuel

Conventional diesel fuel in accordance with DIN EN 590 ("petrol station diesel") contains up to 7% biodiesel (FAME)! Despite optimal storage and antioxidants that are present in the fuel, this biocomponent is subject to natural ageing. Blended biodiesel leads to the formation of acids and deposits. Old diesel fuel may prevent the operability of an emergency power system, typically at the point when it is needed. Instead of using filling station diesel, Schaper recommends the use of heating oil (low-sulphur) in accordance with DIN 51603-1. Due to the standard requirement, it is free of biodiesel and therefore more stable in terms of storage. If necessary, an additive must be added to improve the cetane number (ignition quality).

A system partner for CHP and emergency power systems

Friedrich Schaper Notstrom- und BHKW-Technik GmbH is a forward-looking, owner-managed company in the field of mechanical and plant engineering with a 120-year company tradition. Schaper offers customers in the public sector, energy suppliers/municipal utilities and hospitals as well as operators of biogas plants the complete supply chain from production and installation to maintenance and the modernisation of their plants. The company focuses on a catchment area within 200 km of Hanover and has successfully implemented over 800 projects. Annual sales amount to €4.0 million.

For further information: www.schaper24.de



TOP PROSPECTS – TRAINING AT OELCHECK

"Which profession suits me? Do my ideas match the reality? What can I expect from the training? And what prospects do I have in the long term?" Most young people ask themselves many of these questions before starting their professional lives.

There were answers to these questions at the Rosenheim Apprentice & Career Fair and the IHKjobfit. Well-known companies introduced themselves to future trainees. As one of the leading training companies in the region, OELCHECK was naturally there.



At our stand, students, parents and teachers asked about our company, the wide range of social benefits and the apprenticeships offered for the following job titles:

- Chemical laboratory assistant
- IT specialist specialising in application development
- Digital and print media designer
- Office management assistant.



SOS VARNISH!

WESTO GETS HYDRAULIC AND TURBINE OILS BACK INTO SHAPE

How do they do this? With a wealth of know-how and pioneering processes, WESTO Varnish removes the hazardous reaction products of oil ageing and extends the service life of hydraulic and turbine oils many times over. It's hard to be more any more cost-effective and sustainable than that!

Varnish and why it's so threatening

Like all oils, hydraulic and turbine oils age over their service life. Atmospheric oxygen accumulates on the molecular chains consisting of hydrocarbons. The oils oxidise. To stop this process, antioxidants are added. However, over time they will degrade. At some stage, the point is reached at which oxidation and the associated degradation of the base oil are no longer adequately slowed down. Extremely high temperatures at certain points, e.g. on individual bearings with narrow bearing gaps, increasingly small oil volumes as well as possible contamination with dust, water and wear particles, also accelerate the ageing of the oil. Lubricant performance deteriorates. In addition, oil ageing usually also has resin or gel-like reaction products in its tow.

These are based on a combination of parts of spent antioxidants and degraded components of the base oil. If the oil can no longer hold these reaction products in solution, they change from a dissolved to a suspended state. They fail more frequently and agglomerate due to their polarity. At the same time, they bind foreign particles from very fine dirt, become larger and tend to settle. Metallic components, such as slide bearings, oil lines, oil coolers, tanks and gears, are the preferred targets for their deposits. Varnish is created with its orange-brown, lacquer-like coverings. These cannot be wiped off, but harden under the influence of temperature. In addition, the reaction products of oil ageing usually cause even more blocking of the filters and impair the function of valves. Expensive filter cartridges require more frequent replacement. Control valves with gaps of just a few μm can stick. Edge fractures on the valve pistons or jamming can occur and result in a malfunction of the control mechanism.

Varnish is persistent! Once it has a grip on a system, a simple oil change generally does not bring about any long-term improvement. Fresh oil has a higher solubility than used oil. It thus replaces existing coverings on flow-through surfaces. Caution must also be exercised when changing the oil in the control circuit! If a system is shut

down, the oil temperature drops. The cooling often leads to an additional agglomeration of the oil degradation products in the control circuit and therefore to increased impairment of the functionality.

A vicious circle? WESTO knows the way out!

WESTO specialises in all matters of oil maintenance and has extensive expertise in the field of varnish removal. WESTO uses the ESP resin agglomeration process of FLUITEC and OELCHECK lubricant analyses.

The following report shows how varnish can be removed and how oil fillings in hydraulic systems and turbines can often be saved for years without replacement and for further use:

Stadtwerke München: 8,500 l of turbine oil: varnish removed and a saving of two oil changes

2016 – SOS! The 8,500 l of turbine oil of an SWM (Stadtwerke München GmbH) steam turbine is suspected of being coated with varnish. This is generally visually evident from orange-brown deposits on the bottoms of tanks, valves and pipe bundles among other things, as well as from dark stripes in the tank at the oil level. In addition, increased foam formation often occurs.

WESTO first examines the abnormalities noticed by the SWM maintenance engineers as well as the history of the system and its oil filling schedule. An analysis of the turbine oil is commissioned straight away. Because at WESTO: Without an in-depth lubricant analysis from OELCHECK, it is not possible to either make a statement about the condition of the oil or the system, nor a decision about any service measures.

In the case of the 8,500 l of turbine oil, an analysis also provides



View into a pinion bearing: Before ...



... and after the varnish treatment.

final clarity: once again, it proves that OELCHECK tribologists not only have a great deal of expertise, but also assess the samples in their entirety. The MPC (membrane patch colorimetry) test is the only procedure worldwide that can be used to quantify an oil's potential to form varnish. But in this exceptional case, the test does not provide alarming values. Nevertheless, the tribologists from OELCHECK still diagnose varnish! The antioxidants in the oil are largely consumed and other indicators have reached critical levels.

One thing is clear: even if the MPC test does not yet indicate an acute, increased risk of coating, problems with deposits are expected in the foreseeable future. The turbine oil has reached the end of its service life. Therefore, further steps should be considered at an early stage. Stadtwerke München assumes that an oil change will have to be carried out before the next major inspection in 2022. But WESTO recommends waiting and starts a rescue operation for the 8,500 l of turbine oil.

2017 – WESTO has been working closely with FLUITEC on the topic of post-additives for years and already acquired Decon AO, a new development of the international clean-tech company. 3% of the agent is added to Stadtwerke München's turbine oil in a controlled manner. And the promised effect soon starts. The dissolving power of the oil has improved. The next major overhaul of the turbine is due in 2022. OELCHECK monitors the turbine oil with regular analyses. But will the 8,500 l definitely last until the next overhaul?

2022 – The year a decision is made! It doesn't look good at first. Worryingly high temperatures are detected on the bearings of a pinion bearing. Do the 8,500 l of turbine oil now have to be finally replaced with fresh oil? During ongoing operation and even before the turbine overhaul, WESTO uses a filter system in the bypass flow that works in a completely differently way to the classic bypass filtration. Both suspended and dissolved deposits need to be eliminated from the oil in order to eliminate the risk of varnishing. No typical off-line filter system can handle this, as many of the particles are usually under 0.1 µm in size and are therefore too fine to be captured. – WESTO is convinced that only a cleaning that makes use of the FLUITEC ESP procedure can handle this task. It works by accumulating the oil reaction products on special resins and removes both suspended and dissolved oil reaction products, even at the operating temperature of the oil, i.e. during ongoing operations as well. In addition to the treatment of the turbine oil using the ESP process

and mechanical cleaning of the pinion bearing, FLUITEC Decon AO is added again as a precaution in order to protect the oil from a recurrence of the tendency to form varnish.

OELCHECK then meticulously examines the turbine oil. The result: All parameters leave nothing to be desired! The turbine oil is back in shape! – The bearings of the steam turbine are also inspected as part of the overhaul. They are clean and free of deposits. Only the cooler of the system needs to be chemically cleaned of stubborn deposits.

2023 – Seven years have now passed since the first anomalies in 2016. The 8,500 l of turbine oil are still in use. For safety reasons, the oil is now accompanied by an ESP system permanently installed in the secondary flow and regularly monitored by OELCHECK all-inclusive analyses. WESTO has achieved the goal of putting the varnish in its place and maintaining the performance of the oil fill twice. An oil change did not have to be carried out in either 2017 or 2022.

Stadtwerke München have thus saved 2 x 8,500 litres of fresh turbine oil as well as associated expenses for the disposal of used oils and maintenance! In addition, this naturally also means conservation of resources and less strain on the environment thanks to the avoidance of oil changes and the corresponding disposal of used oil. It's hard to be any more cost-effective and sustainable than that!

WESTO – oil maintenance to keep things running!

Not sprinters that will soon run out of breath, but rather long-distance and endurance runners with a lot of mileage – that's what WESTO creates from the hydraulic and turbine oils of its customers. From the start of a plant and the operating phase to the overhaul and subsequent recommissioning – WESTO accompanies the oils throughout the entire production cycle. WESTO knows that oils are an important factor in increasing the availability of production facilities.

The environment and WESTO customers benefit from the operation of long-distance and endurance runners:

- The oils last much longer.
- Resources are conserved. Less waste oil is produced.
- The plants remain stable for longer.
- Customers not only work more economically, but also in a more sustainable way!

Founded in 1971 as a repair company and spare parts supplier for hydraulic systems, WESTO is today the leader in all matters related to oil maintenance! In addition to providing services, the company also manufactures off-line filter systems and varnish treatment systems. Customers in Germany and neighbouring European countries are served from the company headquarters in Pulheim near Cologne. – WESTO has been working closely with FLUITEC and OELCHECK for years. FLUITEC is an innovative (clean) tech company composed of international experts. The company is dedicated to a cleaner world through Fill-For-Life lubricants. The partnership with OELCHECK, the market leader in lubricant and service product analyses, has been in place for almost 30 years. And without a well-founded lubricant analysis from OELCHECK, WESTO cannot make a decision related to any oil maintenance measures.

For further information: www.westo.de

OILDOC SEMINAR PROGRAMME

Your contact for further training:

OilDoc GmbH
 Petra Bots, Rüdiger Krethe
 Kerschelweg 29
 83098 Brannenburg
 Tel. +49 (0)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



Current dates

21-22/09/23	Damage to bearings, gears and motors
26-27/09/23	Lubricating greases – properties, selection and monitoring
05-06/10/23	Lubrication and oil monitoring for hydro power plants *NEW*
17-18/10/23	Lubrication and oil monitoring for stationary gas engines
19-20/10/23	Online oil sensors – A practical seminar
24-25/10/23	Fundamentals of lubricant application II Module in the “Certified Lubricant Expert” series. Can be booked individually.
26-27/10/23	Lubrication and oil monitoring for paper machines
07-09/11/23	Lubrication and oil monitoring for turbines/turbo-compressors
14-16/11/23	Lubrication and oil monitoring for gears
28-29/11/23	Lubrication and oil monitoring for construction machines
30/11-01/12	Additives for lubricants and the monitoring of them
04-07/12/23	Machine monitoring by means of oil analysis, Advanced course *MLA II Certificate Course*
12-13/12/23	Infrared spectroscopy in practice – understanding and interpreting IR spectra
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 in the “Certified Lubricant Expert” series. Can be booked individually.

NEW IN THE RANGE OF COURSES



Lubrication and oil monitoring for hydro power plants

05-06/10/2023: 2-day seminar

Hydro power plants are an inseparable part of sustainable energy production. In terms of design, water turbines differ significantly from steam or gas turbines. Depending on the turbine type, age and power class, the design is also very variable. The lubricants that are used, as well as the oil monitoring concept, must take into account the technical differences, which are sometimes considerable. In this seminar, Rüdiger Krethe shows how oil analyses are a reliable tool for monitoring in hydropower plants – when applied correctly. He also discusses how professional handling of lubricants avoids recurring practical problems (e.g. an increased tendency to accumulate deposits) and what advantages bio-oils offer.



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

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

In 2024, we will be expanding our range of training courses with an exciting **certification course for beginners in the multifaceted world of lubricants and oil monitoring**. The 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 the participants through the complex correlations between proper lubrication and the crucial role it plays in the smooth functioning and safety of machines. Participants will not only learn theoretical concepts, but will also be introduced to the practical methods and principles of lubricant monitoring in operation. This allows them to implement effective strategies for optimal lubrication and maintenance in real working environments.

An outstanding highlight of this course is the option of an **official certification** by the renowned International Council for Machinery Lubrication (ICML), which is recognised worldwide. Upon completion of the course, participants will have the choice between two different certificates, depending on their 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.

OilDoc has many years of experience and is listed as a partner of ICML. OilDoc has been successfully preparing committed participants for the ICML certificate examinations for over 10 years.





AWARDED FOR OUTSTANDING PERFORMANCE: RÜDIGER KRETHE RECEIVES THE RAY THIBAUT AWARD

We are pleased to announce that as part of the STLE Annual Meeting in May 2023 in Long Beach, California, the renowned Raymond L. Thibault Excellence in Education Award was awarded to our Managing Director of OilDoc, Rüdiger Krethe. This prestigious award recognises members of the STLE (Society of Tribologists and Lubrication Engineers) who have excelled in the practical aspects of tribology and lubrication technology through their passionate and pioneering work as trainers.

For more than 25 years, Rüdiger Krethe has been passionate about passing on knowledge in seminars and lectures. His field of expertise includes proactive condition monitoring, sustainable lubrication and lubricant analyses. Through his extraordinary efforts, he has significantly contributed to raising awareness of the importance and impact of improved lubrication and tribology in industry. The Ray Thibault Award to Rüdiger Krethe not only recognises his impressive expertise and enthusiasm, but also his contribution to strengthening the STLE community. His dedicated work has helped inspire and empower professionals in this field.

For more information on STLE, visit: www.stle.org



REVIEW: OILDOC CONFERENCE 2023

In May, KUKO Rosenheim was once again transformed into the epicentre of the world of lubrication when the OilDoc conference opened its doors. With around 400 participants from 24 different countries, the event turned out to be the highlight of the year for the industry.

The two-day conference provided a fascinating platform for experts, scientists and industry professionals to discuss the latest developments and trends in lubrication technology. With a total of 85 top-class lectures, the participants were given a comprehensive insight into the world of tribology. From groundbreaking research results to tried-and-tested solutions, there was something for everyone.

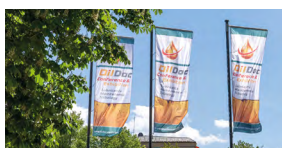
In addition to technical depth, the OilDoc Conference 2023 also offered a number of unforgettable social events. The two colourful evening events offered participants the opportunity to exchange ideas and make new contacts in a relaxed atmosphere. Particularly noteworthy was the Bavarian evening, during which guests

were able to immerse themselves in the rich tradition and culture of Bavaria. The workshop and excursion day, which was offered for the first time, was also very well received.

Feedback after the event was overwhelmingly positive. Participants praised the first-class organisation, the variety of lectures and the successful selection of social events.

In our video at www.oildoc-conference.de, you can take a look back at some of the best moments of the conference.

We are already looking forward to welcoming you to the next OilDoc conference. **Please make a note of the date today: May 13-15, 2025.**



OILDOC SEMINARS, TAILOR-MADE FOR YOUR TEAM

In the ever-evolving world of technology and industry, keeping your team up-to-date is critical. This is where OilDoc comes into play! We are proud to offer you a comprehensive range of more than 20 different seminars in the fields of lubrication and oil monitoring.

Our seminars are carefully designed to cover a variety of topics, with each course addressing different focuses and areas of application. It's not always easy to find the right time to attend our regular seminar events, especially as some courses are only offered once a year or every two years.

But don't let that stop you: our OilDoc seminars can be customised

and delivered to your team on request. This tailor-made approach offers numerous advantages, including: specific content, confidentiality, team building, practical implementation in everyday work and flexibility.

Although individual training may require a slightly higher investment at first, the benefits far outweigh the drawbacks. The long-term benefits for your team and your business are undeniable.

So if you're already forging your training plans for 2024 and are looking for lubrication and oil monitoring training for your maintenance team, this is the perfect time to secure your preferred date.

OUR ADVANTAGES AT A GLANCE



Quality



Speed



Expertise



Experience



Customer focus



Innovation



Individuality



Independence



All-in-one analysis kit



International

OELCHECK GmbH

Kerschelweg 28
83098 Brannenburg
Germany

Tel.: +49 8034 9047-0
info@oelcheck.com
www.oelcheck.com