



SPRING 2022

OELCHECKER



TECHNOLOGY FOCUS

Record prices for fuels –
but the alternatives are limited

PARTNER FORUM

Ingenious and efficient –
the S-Roll by ANDRITZ Küsters

OELCHECK INSIDE

News from the lab –
Large photo gallery

AND MUCH MORE ...

CHECK-UP

” Just a few weeks ago, they were still leading normal lives. Now the inhabitants of Ukraine fear for their lives and we are deeply touched by the images of destroyed cities and fleeing people. Helping wherever and however you can is called for!

We had a spontaneous idea for this, which was immediately put into practice. One of our OELCHECK houses had a large company apartment empty. On Tuesday, we reported this to the authorities. After two days, the call came in the late afternoon: “Can you pick up six people from Kyiv in Munich today at 7 p.m.?” Of course, we could. Paul Weismann personally took the wheel of the company’s own minibus and was there on time. At the same time, things were happening in Brannenburg. With the exception of the kitchen, the apartment was completely empty. Provisional sleeping quarters were set up in no time at all and something was to eat was procured. By tackling the matter together, we achieved everything on time. The next day we bought new furniture, kitchen accessories, clothes and an initial supply of food. Six girls and women aged 14 to 80 now live in Brannenburg – including a dog and cat. Husbands and sons have stayed behind to defend their homeland.

The new housemates still have to go through a few administrative procedures. The youngest will soon be attending a school in Brannenburg. And two women hope to return to work soon as dialysis doctors. They all learn German together for several hours each day – which is immensely important for the coming months and hopefully a small distraction from the terrible reports from home.

Paul Weismann Barbara Weismann

“



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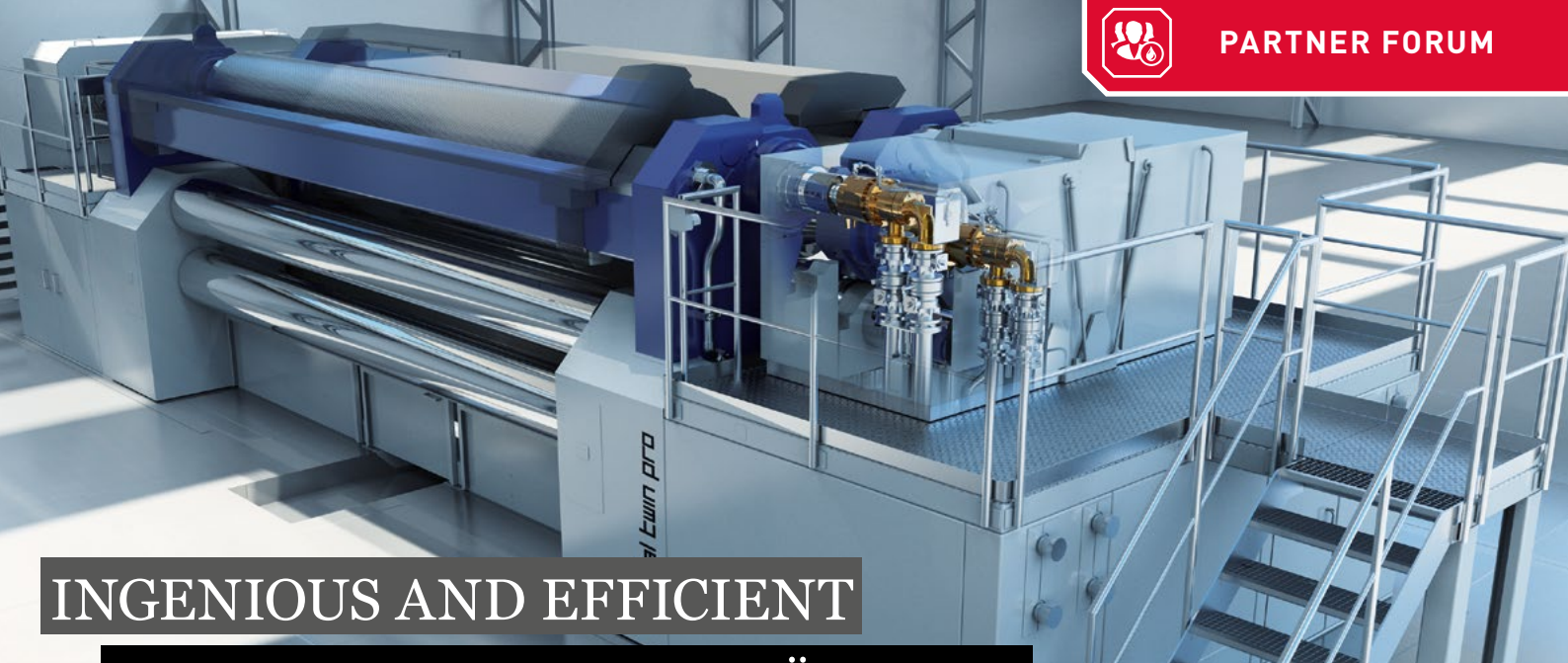
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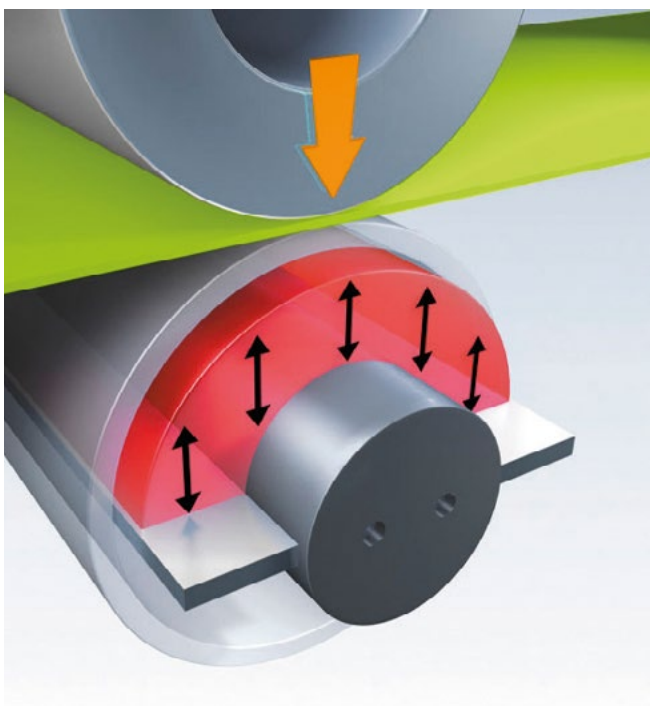


INGENIOUS AND EFFICIENT THE S-ROLL BY ANDRITZ KÜSTERS

neXcal twin pro – the latest calender development at ANDRITZ Küsters. With a speed of up to 1,300 m/min, it sets standards in nonwovens production.

Nonwovens for medical masks and diapers, paper for a wide range of products and textiles of all kinds – they all have one thing in common: In their production, calenders are needed, in which an invention from 1956 is usually used. Back then, Eduard Küsters revolutionised calender and roller technology with a floating roller, the S-Roll. The rotating roller shell of a bending compensation roller is hydrostatically supported on a fixed axle, so that the same linear force acts on the material over the entire width. Previously, the calendered materials had different strengths, but thanks to Eduard Küsters' S-Roll, this problem soon became a thing of the past.

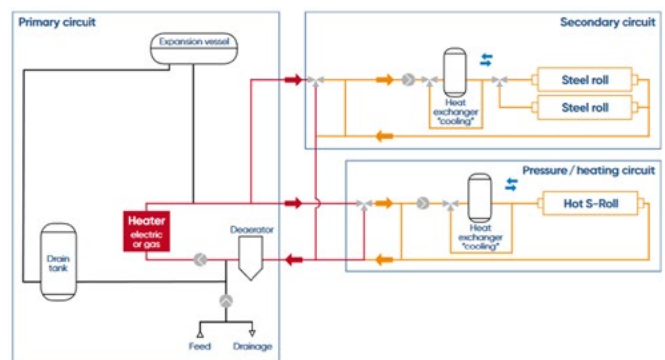
Today, ANDRITZ Küsters is part of the ANDRITZ Group, a leading international technology group. ANDRITZ Küsters has been successfully supplying turnkey production systems and machines, engineering, project management and service for the paper, nonwovens and textile industries for more than 65 years. The company offers tailor-made technical solutions and services for a variety of applications – from highly complex processes to standard solutions for growth markets.



The ANDRITZ Küsters Hot S-Roll principle.

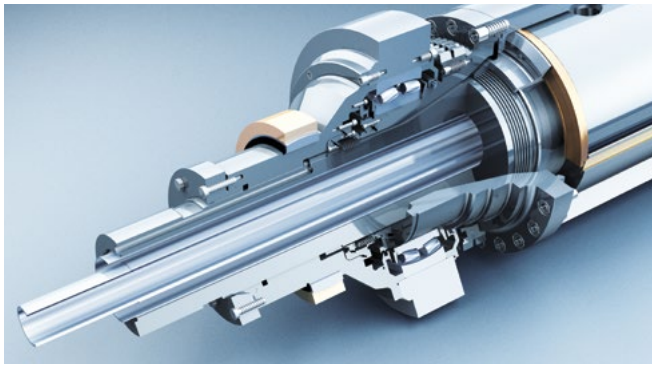
How hot can it be? It depends on the roller!

The term calender comes from the French word "calandre" for roller. In mechanical engineering, this refers to a system consisting of several rollers arranged one on top of the other. The material to be processed passes through the gaps between the pressurised rolls, similar to a laundry mangle. In order to compensate for the natural deflection of the rollers, a steel axle filled with oil is located inside the bending compensation roller, the S-roll. This stationary steel axle, which functions as a support, is sealed against the rotating outer roller in such a way that hydrostatic pressure can be built up with the oil. The elastic outer roller shell can then be deformed by the pressure differences in the oil in such a way that a uniform linear force can be generated on the material to be calendered.



In the nonwovens industry, in addition to the uniform linear force, the rollers also need to be heated. The individual fibres of these nonwovens are also thermally bonded together and solidified. Lightweight nonwovens such as medical masks and hygiene products can only be manufactured in this way. The ANDRITZ Küsters Hot S-Roll is used in their production. It works with a surface temperature of up to 275°C.

For this purpose, the rollers installed in the calender are indirectly heated to this temperature with heat transfer oils. In a heating system operated with gas or electricity, two different heat transfer oils are usually heated, which supply two separate oil circuits. A mineral-based heat transfer oil with a viscosity of up to 490 mm²/s at 40°C is used for the Hot S-Roll. The heat transfer oil in the primary circuit is heated to almost 300°C. Separate secondary circuits supply the calendar rollers. The heating pressure circuit supplies the Hot S-Roll. The heat transfer oil in the Hot S-Roll has the following functions: Heating, lubrication and pressurisation.



An ANDRITZ Küsters Hot S-Roll in detail.

Selected heat transfer oils

Only mineral heat transfer oils approved by ANDRITZ Küsters should be used as heat transfer oil for the primary circuit of the Hot S-Roll. Sustainably trouble-free operation of the system depends on these oils, which must also supply the sealing strips and mechanical seals installed in the S-Roll.

In principle, a heat transfer oil should have the following properties:

- Extremely good resistance to thermal stress. If it does not meet this requirement, it has an increased tendency to thermal decomposition or cracking. This results in the breakdown of molecular structures. Degradation products are formed, such as sludge and coke deposits, which in turn have a negative effect on the flash point and viscosity of the heat transfer oil.
- Excellent thermal conductivity, so that the heat is released quickly and evenly.
- A high, operationally reliable flash point appropriate for the application, which must not fall off too quickly during use.
- Despite relatively high viscosity, good flow behaviour and easy pumping ability.
- Good lubricating properties for applications such as in a Hot S-Roll.
- Overall excellent ageing stability and a long service life.
- An extremely low tendency to corrosion so that the oil does not have a corrosive effect even in contact with components or non-ferrous metals of seals.
- A high initial boiling point so that no volatile or highly flammable gases form in the oil expansion vessel under atmospheric pressure.

OELCHECK analyses ensure sustainable use

Up to 3,000 litres of mineral heat transfer oil are required in the primary circuit that supplies an ANDRITZ Küsters Hot S-Roll. In order to achieve service lives of up to seven years, the oils are continuously maintained and regularly monitored with oil analyses. After all, even a high-quality heat transfer oil at temperatures of almost 300°C is not immune to thermal decomposition.

ANDRITZ Küsters uses OELCHECK all-inclusive analysis kits 3 to check the heat transfer oils of the S-Rolls and Hot S-Rolls and also recommends these to all system operators. OELCHECK's all-inclusive analysis kits for heat transfer oils meet the requirements of DIN. Finally, in Germany and in many other countries, an annual inspection of the heat transfer oils in accordance with DIN 4754-1 is mandatory.

OELCHECK considers all important parameters

In addition to the flash point and general oxidation state, this includes the water content, impurities, possible mixing such as with an oil from the other circuit, a change in viscosity as well as existing wear particles.

For large industrial systems, OELCHECK also recommends determining the coke-forming tendency according to Conradson in accordance with DIN 51551 (CCR, Conradson Carbon Residue). Especially in large systems, coke-like deposits can form on seals, on components such as mechanical seals or in the piping of heat exchangers. These residues cause the oils to age faster and become acidic. In addition, they become more flammable because the deposits cause the viscosity and flash point to drop.

By determining the coking tendency according to Conradson in accordance with DIN 51551 (CCR, Conradson Carbon Residue), OELCHECK also determines whether a used heat transfer oil tends to form harmful deposits. If the limit or warning values defined by OELCHECK tribologists with the system or oil manufacturer are exceeded, OELCHECK tribologists advise changing the oil or re-checking the system after a shorter period of time, depending on the operating time and system size. – For good reason, OELCHECK recommends checking the coke value of all large-volume systems whose heat transfer oils are exposed to particularly high temperature loads, as integrated in the all-inclusive analysis kit 5.

Part of a leading international technology group

ANDRITZ Küsters, headquartered in Krefeld, Germany, with a branch in Spartanburg, USA, supplies technologies and services for the paper, nonwovens and textile industries. The company is a globally recognised specialist for paper, nonwovens and textile calenders, wetlaid nonwovens, coating and finishing systems. The Krefeld site also houses a modern roller service centre, where rollers are prepared, repaired or modernised for international customers.

ANDRITZ Küsters is part of the international technology group ANDRITZ and employs around 350 people. The ANDRITZ Group is one of the world's leading suppliers of innovative plants, equipment, systems and services for the pulp and paper industry, hydro-power, the metal processing industry and forming technology, pumps, municipal and industrial solid-liquid separation as well as animal feed and biomass pelleting. The listed technology group from Austria employs around 27,200 people at over 280 locations in more than 40 countries.

For further information see: www.andritz.com



OUR IT DEPARTMENT IS GROWING

The OELCHECK IT department, headed by Michael Linnerer, is responsible for ensuring that the large number of IT-supported processes in our company mesh seamlessly. It looks after the company's own data centre, the entire hardware landscape, all application programs, specially developed software solutions, the LAB.REPORT customer portal and the OELCHECK App 4.0.

Michael Linnerer



"With an increasing number of samples and additional services for our customers, the demands on the IT department are also constantly increasing. For this reason, we have now increased the number of employees in this area to nine. But where there is growth, there is also the need for adapted structures. That's why there are precisely documented processes and clearly defined areas of responsibility for every single employee in the well-established team of software developers and system administrators from three countries."

Most popular IT services

- Simple and secure **sample entry with and without QR code using OELCHECK APP 4.0**. This combination is a real hit! Customer-specific information as well as details of the individual machines are saved once and are then always available. Only the



data of the current oil sample needs to be added.

In addition to sample entry with QR code, there is also the option of direct machine search as well as the option of calling up laboratory reports and sending photos of the sample. Even without an internet connection, the data can be collected in offline mode. As soon as there is an internet connection, the data is then transmitted to OELCHECK.

By the way: Many OELCHECK customers have already integrated our QR codes on their machines into their own systems. This saves them even more time and reduces the rate of any input and transmission errors.

- A **data supply suitable for our customers' individual data processing**. The transmission takes place via the LAB.REPORT web portal, an FTP server or a specially programmed API interface. The data from the complete analysis is automatically imported into the customer's maintenance program. It couldn't be more practical!

WELCOME TO OELCHECK

Anton Kathrein



After studying high-frequency technology and many years of managing his own family business, he has been responsible for global sales at OELCHECK since October 2021.

"Lubricant and fuel analyses – behind these inconspicuous words, a multifaceted, fascinating world opens up. I've been infected by this! Systems, whether large or small, should be running. Reliably and smoothly. But what is needed to keep it that way? How do hydraulic systems and engines remain efficient over the long term? How can we ensure that wear on mechanical components such as bearings is kept to a minimum and, if it does occur, is detected in good time and that necessary maintenance can be carried out before major damage and failures occur? How can we use the findings and experience gained from over 30 years of analyses in a wide range of areas to ensure that valuable operating materials remain operating resources as long as possible and do not become consumables?"

With my team, we help our customers to better know the condition of their systems and machines and thus be able to operate them more reliably. In sales, we want to understand the needs and situations of the customer in detail in order to recommend the appropriate scopes of analysis on this basis and to establish long-term business relationships. The key to this is not simply producing and collecting data, but rather bringing together the right information in a meaningful way. This is where we set standards at OELCHECK!

I am thrilled by the combination of many years of experience and in-depth, well-founded knowledge with the aspiration of a young, motivated team not to accept things as given, but to improve them further. I would like to contribute to this with my own experiences!"

Dominik Drenkard



Joined the OELCHECK tribologist team in March 2022. The mechanical engineering graduate (UAS) brings with him, among other things, many years of experience in the design and development of transmissions.

"I've known OELCHECK for many years! As a customer, I have already worked intensively with my new employer. I come from a mechanical engineering background, specialising in transmission development/design. That's why I'm also a Certified Vibration Analyst ISO Cat. II, MIBoC, M-129449-01. In my last job, I sent numerous oil samples to Brannenburg, both for damage analyses as part of gearbox repairs and for machine checks.

During a seminar on gearbox lubrication and a visit to the OilDoc Academy at the oil sensor symposium, I gained interesting insights and a thoroughly positive impression of the laboratory, the work and the employees at OELCHECK.

When I felt the desire for a career change, I deliberately chose to work as a tribologist at OELCHECK. After around 17 years in the design and development of transmissions, engine pistons and valves for injection pumps, I am now getting to know a multifaceted field of work where I can contribute my previous professional experience and at the same time learn a lot of new things. From now on, for me it's no longer just about transmissions, but all machine elements as well as lubricants and operating materials and their analysis.

Personally, I not only like to keep learning new things – I also want to share my knowledge. At OELCHECK, among other things, I have the perspective of passing on my knowledge and experience in seminars and symposia such as at OilDoc."



MEET THE TEAM!

It's on again! After a long break due to the pandemic, numerous trade fairs and conferences are starting again. We will be there with a stand at the following events and look forward to your visit!



30-31/08/2022 | Stuttgart



06-08/09/2022 | Essen



20-23/09/2022 | Berlin



27-30/09/2022 | Hamburg



24-30/10/2022 | Munich



15-18/11/2022 | Hannover

A POPULAR AND MODERN TRAINING COMPANY

Training is an important building block for the future of our company, because we rely on well-trained employees. By training ourselves, however, we also take on social responsibility and open up good prospects for a successful career for our trainees.

OELCHECK offers training for:

- **Chemical laboratory assistant**
- **IT specialist** specialising in: Application Development
- **Digital and print media designer** specialising in: Design and technology
- **Office management assistant.**

In recent years, 27 junior employees have already successfully completed their training at OELCHECK. Another nine are currently still in the training phase. The dedicated team of five prospective chemical lab technicians, three office management assistants and one IT specialist will soon be supplemented by a future media designer.



Apprenticeships at OELCHECK are highly sought-after in the region, as we provide the next generation with top-notch skills for their future careers. After appropriate training, the trainees carry out almost all activities independently. This teaches them early on to take responsibility for their work. After successfully completing their training, the next generation at OELCHECK have the best chance of being hired.

Wir suchen Sie

TRIBOLOGE (M/W/D) Arbeitsort: Brandenburg

Ihr Anforderungsprofil

- Abgeschlossenes technisches Studium im Bereich Maschinenbau, Mechatronik, Verfahrenstechnik oder einer vergleichbaren Fachrichtung
- Fundierte Kenntnisse über Schmier- und Betriebsstoffe sowie deren Anwendung und idealerweise auch Analyse
- Hohes Maß an Kundenorientierung, Empathie sowie Kommunikationsfähigkeit
- Selbstständige, zuverlässige Arbeitsweise, Einsatzbereitschaft, Eigeninitiative und Flexibilität
- Sehr gute Englischkenntnisse in Wort und Schrift
- Sicherer Umgang mit PC-Standardanwendungen

Wir freuen uns auf Sie!

Ihr Aufgabengebiet

- Sie beurteilen und kommentieren die in unserem Labor ermittelten Untersuchungsergebnisse und erstellen präzise Diagnosen für Schmier- und Betriebsstoffe.
- Sie setzen Ihr Expertenwissen bei der technischen Kundenberatung und bei diversen Sonderprojekten ein.

Unser Angebot

- Aufgeschlossenes, kollegiales Team und modernste Arbeitsplätze
- Hohes Maß an persönlicher Selbstständigkeit
- Faire, leistungsgerechte Vergütung
- Eigene Cafeteria mit Fresh Cooking
- Unvergessliche Firmenevents
- Firmeneigenes Fitnessstudio mit Sportkursen
- Betriebliche Altersvorsorge

Senden Sie Ihre aussagekräftigen Bewerbungsunterlagen an unseren Geschäftsführer Paul Weismann (bewerbung@oelcheck.de)



LAB CONVERSION COMPLETED!



Since spring 2022, the OELCHECK laboratory with its over 130 testing devices comprises 2,350 m²!



Friendly and bright – these are the ideal premises for the laboratory.



After moving some departments to our new third building, 350 m² of space were available. These were extensively converted into laboratory rooms and have now been put into operation.



OELCHECK employees appreciate the generous amount of space...



... as well as the state-of-the-art equipment in the laboratory.

OELCHECK'S COMPANY SUGGESTION

SCHEME WELCOMES CREATIVE SUGGESTIONS

OELCHECK employees often have the best view for optimisation potential in our company. You are all invited to submit suggestions for improvement. This can be a proposal to simplify or speed up work processes, to increase quality even further, to improve the working atmosphere even further or to increase environmental protection. Not to mention measures to make our services even more user-friendly for our customers. There are a lot of topics and OELCHECK employees are enthusiastic about them. A total of 43 proposals were submitted in 2021, of which 25 will be implemented.

All accepted proposals will be rewarded with a financial bonus. In 2021, this amounted to a total of over EUR 1,600. In addition, there will be an annual raffle for all accepted proposals. On 24 January, the winner was drawn at random by Paul Weismann's daughter. Stefan Mitterer and Paul Weismann commented on the draw and thanked everyone who made suggestions. The draw was posted on the intranet by video message. The winner was delighted to receive a shopping voucher worth EUR 300.



Managing Director Paul Weismann and Stefan Mitterer (Business Director Technical Service & Sales) were pleased to receive many constructive suggestions.



Adobe Stock – auremar

RECORD PRICES FOR FUELS BUT THE ALTERNATIVES ARE LIMITED

The ever-increasing prices at the filling station are not only putting a strain on the budgets of motorists and freight forwarders. Operators of construction and agricultural machinery, as well as generators, are also struggling with the rising motor fuel costs. Some of them are already considering alternatives to diesel fuel. The scenarios range from biofuels, heating oil, salad oil to even old frying fat. But not every one of these “motor fuels” allows unimpeded operation!

Adobe Stock – Image’in



Heating oil is heating oil and diesel is diesel

In the German-speaking world, a distinction is made between Brennstoff (fuel) and Kraftstoff (motor fuel). Often, both terms are incorrectly used as equivalent. But it's clear: Brennstoff is used to generate thermal energy and Kraftstoff is used to generate mechanical energy. Heating oil and diesel fuel are very similar, both are so-called middle distillates. The decisive factor is: diesel for motor vehicles in accordance with EN 590 is produced specifically for the operation of internal combustion engines, domestic heating oil in accordance with DIN 51603-1 is specified for use in burners. Engine parameters such as ignition delay (cetane number) are therefore not relevant for heating oil. Nevertheless, the boiling curve specified for domestic heating oil is largely identical to that for diesel. This would make use in a vehicle theoretically and technically possible. In particular, older vehicles with mechanical injection systems or long-stroke diesel engines, such as those used in heavy-duty commercial vehicles, or medium-speed and slow-running diesel engines on ships can deal with “inferior” (not EN 590) fuel quality. A slightly higher ignition delay does not matter here, for example. However, the modern common rail injection systems in passenger cars in particular are sensitive to poorer fuel quality. In order to meet the requirements of today's applicable exhaust gas regulations, very high injection pressures (up to 2,700 bar) are required to achieve fine atomisation of the fuel and thus optimum mixture formation. This results in extremely high component fits with minimal tolerances. Even the smallest impurities cause major problems here.

Motor oil under constant stress

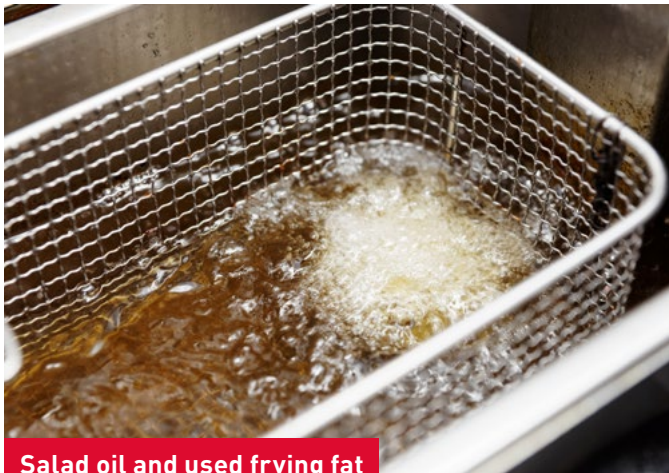
The sulphur content in heating oil is still up to five times higher than in diesel fuel. This sulphur is oxidised in combustion and converted into sulphuric acid with the concomitant condensate when the temperature falls below the dew point and is introduced into the motor oil via blow-by. There, it must be neutralised by the alkaline reserve (base number, BN). This is thus additionally stressed when heating oil is used, the oil-change intervals are significantly reduced, as the modern low-SAPS oils, as they are standard for vehicles with particulate filters, are not designed for such “motor fuels”. Heating oil can also contain many more PAHs (polycyclic aromatics) than diesel fuel. Together with a possibly lower cetane number, these ensure more sooty combustion in the diesel engine. Once again, the motor oil becomes more stressed. Detergents, which normally dissolve dirt in the oil into fine particles, and dispersants, which hold particles in suspension and transport them to the filter, must be able to handle the additional soot quantity. If a diesel particulate filter is installed, this is more heavily occupied by the additional soot quantity. The result is a faster rise in back pressure, and the particulate filter needs to be regenerated more frequently. This leads to additional fuel entry into the motor oil, as the exhaust gas temperature for soot burn-off in the filter is increased “late” due to increased fuel and shifting of the injection time. Increased oil dilution occurs because the entire fuel is not converted and/or the regeneration cycle is interrupted unexpectedly, e.g. by short-distance operation. The result of the additional fuel input is: the lubricating capability of the oil decreases and increased abrasive wear occurs in bearings and other tribo surfaces.



“Hello – Customs control!”

As described above, heating oil is intended for the generation of thermal energy and is therefore subject to a reduced tax rate in Germany in accordance with the Energy Tax Act. Thus, use to generate mechanical energy and thus in vehicles is prohibited. Use in stationary or mobile emergency power diesel engines or power generators is permitted, as electrical energy is generated here via a generator! Anyone thinking about “charging” their electric vehicle while driving due to the equally high electricity costs with tax-advantaged heating oil and an emergency power generator should note that the tax exemption for heating oil is only valid if the power generator is “stationary” during its use! In order to make the tax reduction recognisable in the market, heating oil is therefore provided with marking substances. Heating oil is very easily recognisable by its red colour. Anyone who refuels their vehicle with heating oil is already committing tax evasion (this is known as readying - ‘Bereithalten’), you don’t even have to have started the engine! Tax evasion is a crime! Customs carries out regular checks.

Many have (unsuccessfully) tried to remove the red colour, and mixing the heating oil with normal diesel to fade the red colour is one “trick” that is often described. It’s important to know: In addition to the obvious red dye, there are other invisible marking substances that Customs can easily detect in the laboratory. So please: steer clear!



Adobe Stock – Kondor63

Salad oil and used frying fat

As with heating oil: From a technical point of view, it is possible to refuel with salad oil or frying fat – especially in older diesel vehicles. For newer, heavy-duty commercial vehicles, in particular tractors, OEMs have issued partial approvals for the use of vegetable oil in accordance with DIN 51605. These approvals even exist in conjunction with modern common rail injection systems. However, this often requires adjustments, e.g. the oil change intervals are shortened.

There are other hurdles for private users with their passenger car: the salad oil from the supermarket is not checked according to the above DIN standard, because after all it’s not a fuel, but a food! No passenger car with a modern common rail injection system is approved for vegetable/salad oil. There are several reasons for this: the engine’s ability to start at colder temperatures (already below +15°C) is limited. The higher viscosity and the polarity of the components ensure a poorer atomisation and thus a poor mixture formation. When starting, it “roars around” for a long time and therefore a lot of fuel is injected, but not burned. The cold running phase also leads to increased fuel input, e.g. due to condensation effects on the cold cylinder wall. This entered fuel accumulates in the engine oil due to its high boiling point. It cannot be allowed to evaporate, e.g. over a longer motorway journey with higher oil temperatures.

In addition to oil dilution, this enriched fuel also causes other problems: like any natural product, the salad oil is subject to an ageing process, which is accelerated by the high temperatures in the oil. This results in sludge formation, which can clog the oil filter and lead to major engine damage due to insufficient lubrication.

In even hotter regions in the engine, this fuel input can lead to carbonisation. This is often the case behind the piston rings. Increasing coke build-up hinders the free rotation of the rings, so-called ring riders occur when the coke has filled the entire groove from behind. Result: massive abrasive wear on the cylinder liner or wall, but also poor ignition behaviour and uneven engine running due to insufficient compression – the ring clearance increases.

Another reason why salad oil should not be used is its ability to absorb more water. This happens, for example, through tank breathing. This leads to corrosion damage to injection components, and cavitation damage is also a consequence. In addition: Vegetable oil contains acids, which can also cause corrosion damage to the injection and fuel system. The ageing of the salad oil can also lead to problems with the injection system. Deposits form, especially in hot spots. These are typically near the injection nozzles. After an engine stops, there is no cooling by the supplied fuel or by the coolant in the cylinder head. Among other things, the salad oil can form rubber-like deposits that stick to the injection nozzles.

In the case of vehicles with regular or daily operation, such deposits are only formed to a limited extent and “washed off” again the next time the engine is running – vehicles with long service lives will have problems here. Once the deposit formation reaction has started, it continues to run. Result: The nozzle needle of the injection nozzle sticks, the nozzle no longer opens (fully). This leads to starting difficulties, irregular engine running – but also damages to the injection pump due to high back pressure. The opposite is also possible: the nozzle no longer closes completely due to the deposits, fuel is brought into the combustion chamber in an uncontrolled manner. Result: heavy oil dilution!

Last but not least: the tax!

Salad oil may look cheap on the shelf at the discount store compared to one litre of diesel at the filling station. However, when used as fuel, the corresponding energy tax rate is automatically due as for “normal” fuel. The price of the salad oil is therefore at the same level as standard diesel at the pump – however, the use of diesel from the pump nozzle is clearly less contentious. Because it is also the case here that the use of incorrectly taxed salad oil is tax evasion! Therefore: steer clear! Unless your vehicle is suitable for this purpose without restriction and has been approved for it by the manufacturer, and you tax the oil correctly.

Anyone thinking about using old frying fat is already advised against doing so here! All negative effects described for salad oil also apply to frying fat. In addition, used oil from the deep-fat fryer is thermally pre-stressed due to its previous use. The ageing effects described thus occur earlier and more dramatically. It also contains fine suspended particles that cannot be removed even with a coffee filter. Here, too, the clear recommendation: steer clear! When frying fat is used for the second and final time in vehicle fleets of a quick-service restaurant chain, it is professionally refined beforehand into fuel via refinery processes (e.g. HVO: Hydrotreated vegetable oil in accordance with EN 15940).



The wide range of biofuels

Sealing materials and plastic hoses installed in the fuel system of passenger cars are often not designed for the use of pure biofuels. In some old vehicles, the fuel B100 FAME or even B7 can cause problems such as swelling hoses and leaky connections. The situation is often different for heavy commercial vehicles and lorries. Manufacturers often already offer conversion kits ex works that upgrade the fuel system for the use of bio-oils. In addition, the operating instructions are often adapted.

When switching from conventional diesel to biodiesel (vegetable oil or FAME), the following should also be considered in addition to the conversion: Biofuel also acts as a solvent! Over the years, every vehicle's fuel system has developed a patina of deposits from fuel components. These are removed by the use of pure biofuels and can be found in the fuel filter. If necessary, a shorter replacement interval for the fuel filter should be considered. However, the injection system may also be affected if the dissolved deposits can be filtered. Biofuel can also act as a solvent outside the tank/fuel system: The paint on older vehicles may not be resistant to bio-oil and may be damaged.

Another problem is availability. Biodiesel (not salad oil!), also known as FAME (Fatty Acid Methyl Ester) or B100, was approved for many diesel vehicles at the beginning of the 2000s and was available at many filling stations. That has changed. There are hardly any filling stations that still offer B100. In addition, most approvals for B100 operation in the passenger car sector were withdrawn by the manufacturers. Today, FAME is typically contained as an admixture component in filling station fuel. According to the Ordinance on the Implementation of the Federal Immission Control Act (BImSchV), the admixture rate in diesel should be 7%, hence the designation B7. Operators of vehicle fleets have other options here; they can procure corresponding quantities of B100 or diesel fuels with higher FAME admixture (B10 to B30) and deliver them to their fleet via fleet filling stations if the vehicles are suitable and approved accordingly. Here we recommend monitoring the condition of the engine oil via regular oil analyses, as this application is considered a niche by the OEMs and may not be tested as intensively. High safety margins are often built into the change intervals and the intervals are set to be significantly shorter. The quality of B100 and the mixtures (B10 to B30) in the tanks of the fleet filling station should also be checked regularly! The oxidation stability of the bio-component is an important parameter that we can check for you as part of a fuel analysis.

Methanol and ethanol

Most alternative fuels are currently unavailable. Pure alcohol fuels such as methanol and ethanol for use in petrol engines are not actually available from filling stations in Germany. Private supply of alcohol fuels, e.g. from the DIY store, and its use as fuel again entails a tax liability. In addition, the fuel systems are not designed for the use of alcohols, and sealing materials and other plastics are very likely to be damaged. The engines must also be adapted. The energy content of methanol is approx. 50% of petrol, so approximately twice the amount would be required for the same mileage if used. In terms of price, the litre of methanol is around €1. With the necessary additional consumption, you are back on a par with petrol – plus the costs for the conversion/adaptation of the engine and fuel system as well as the tax. In addition, most of the methanol available today is currently produced from natural gas, so there is no environmental benefit.

CNG and LPG

Natural gas such as CNG (Compressed Natural Gas) or LPG (Liquefied Petroleum Gas or often referred to as autogas) are significantly better in terms of availability! There are around 800 CNG filling stations in Germany, and around ten times more for LPG. In order for a petrol engine to be suitable for LPG or CNG, a conversion must be carried out. Whether this is possible depends on the vehicle. Neither fuel has an environmental benefit, the gas is currently mainly fossil; in the case of CNG, biogas can be added in small quantities.

E-fuels

They are an option for the future. Defossilisation and thus the achievement of climate targets in transport can only succeed if CO₂-reduced fuels are made available for the existing fleet. However, it will take time for a relevant quantity of these to be available on the market. Political decisions are also still required. If all this is not set in motion, you might have to buy the petrol in the pharmacy again like Bertha Benz...

Q&A ...

? SAMPLE CONTAINERS FOR REFRIGERATION COMPRESSOR OILS

"Your lab report for our refrigerator oil included the following comment: Refrigerator oils may be subject to environmental changes after removal. We therefore recommend only using our special kits of gas-tight vessels and filling them completely.

Why are gas-tight vessels used and what exactly must be taken into account when filling them?"



OELCHECK offers special all-inclusive analysis kits for the analysis of refrigeration compressor oils. These kits contain gas-tight 80 ml aluminium sample vessels. They are suitable for all oil types and refrigerating agents. In addition, they can withstand the internal pressure, which can build up due to residual refrigerating agent in the sample. The sample amount is extracted via the oil outlet provided by the manufacturer in the compressor. If the sample foams quite heavily, some of the gas can be released from the refrigerating agent prior to sealing.

However, if a synthetic compressor oil and/or ammonia is used as refrigerant, exhaust gases must be avoided!

The container should be completely filled and then immediately and carefully closed. These substances have a strong hygroscopic effect and can bind moisture from the air even if the contact with the atmosphere is short. Complete filling of the vessel is also important, as only partial filling allows a gas space above the sample. Outgassing can take place in these spaces. In addition, the moisture contained in the gas compartment would be absorbed by the oil. This, in turn, could distort the water determination result.

? A LABORATORY REPORT WITHOUT EVIDENCE OF OXIDATION

"No oxidation value was given in our laboratory report. Is there a reason for this?"

In some cases, depending on the lubricant or operating material examined, we do not actually state a value for oxidation. This affects coolants and some synthetic lubricants in which glycol is involved.



Synthetic lubricants

Oxidation is a typical ageing reaction of lubricants. Oxygen accumulates on the molecular chains consisting of hydrocarbons. But with some modern synthetic lubricants, the ageing process works somewhat differently. For them, the determination of the classic oxidation value makes no sense.

In your specific case, it is a glycol-based lubricant. These polyalkylene glycols (PAG) are characterised by an increased dissolving capacity of water compared to hydrocarbon-based lubricants, and in some cases they are even hygroscopic. Polyalkylene glycols (PAGs) are particularly used for lubricants, some of which must have excellent elastomer compatibility, but above all thermal stability at elevated temperatures. In addition, PAG is used in some compressor oils and often also in physiologically harmless lubricants with NSF-H1 registration for the food industry.

Lubricants based on PAG are also subject to an ageing process. However, this is not the classic oxidation as with mineral oil-based products. PAG lubricants are manufactured entirely synthetically. In the course of hydrogenation, the docking options for atmospheric oxygen, the so-called olefinic functions, are generally removed. The tendency of these oils to oxidise is therefore extremely low and they are therefore particularly suitable for applications with high thermal loads.

Nevertheless, PAG oils are subject to an ageing process. This is driven by water in the oil and leads to the degradation of the polyglycol chains. The higher the water content of the PAG oil, the more aggressive the water can be. However, water often also poses a hazard to the lubricated components. High water content in polyalkylene glycol oils can eventually cause cavitation damage.

Coolant

However, glycols are not entirely immune to oxidation processes. In coolants, for example, the degradation of monoethylene glycol due to thermal overload is a classic reaction. Acidic degradation products such as acetate, formate, glycolate and oxalate are produced in the coolant. These acid degradation products are responsible for lowering the pH value in coolants, among other things. In extreme cases, this acidification leads to corrosion in the coolant circuit and thus to expensive downtimes or even engine failure. For good reason, therefore, our Advanced and Premium all-inclusive analysis kits for coolant control include the degradation products, acetate, formate, glycolate and oxalate.

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.



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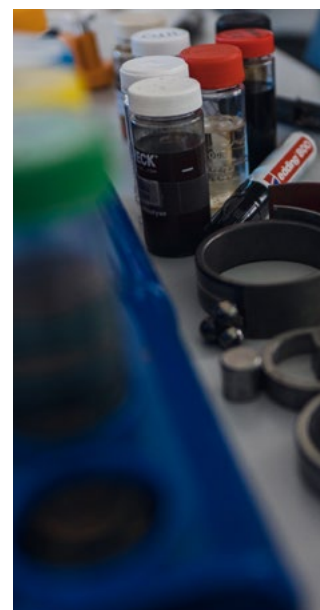
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Current dates

12/05/22	Sustainable machine lubrication in practice *NEW*	from €450
17-19/05/22	Lubrication and oil monitoring for gears	from €1050
24-25/05/22	Online oil sensors	from €720
31/05 - 02/06	Fundamentals of lubricant application – Part I	from €1050
21-22/06/22	Lubrication and oil monitoring for stationary gas engines	from €720
27-30/06/22	Monitoring of machinery with oil analysis – MLA certification course	from €1,320
14-15/09/22	Lubricating greases – properties, selection and monitoring	from €720
20-21/09/22	Fundamentals of lubricant application – Part II	from €720
22-23/09/22	Lubrication and oil monitoring for combustion engines	from €720
26-29/09/22	Expert knowledge for lubricant professionals – CLS certificate course (English)	€ 1390
11-12/10/22	Professional lubricant management	from €720
13/10/22	Coolant – the underestimated operating fluid	from €450
18-19/10/22	VARNISH SYMPOSIUM	€790
14-17/11/22	Expert knowledge for lubricant professionals – CLS certificate course (German)	€1390



The choice is yours: All OilDoc events are hybrid events!

- **You can take part in the OilDoc Academy in Brannenburg**
Our comprehensive protection and hygiene concept in accordance with the current state regulations ensures your maximum safety.

- **Or you can join us online**

We offer you all events as live video seminars. The camera runs all the time and you are there live from your workplace or home office! You can actively participate in the seminar via chat or headset. The documents will be sent to you in advance by post and you will benefit from a reduced participation fee.

HIGHLIGHTS IN SPRING 2022



Lubrication and oil monitoring for paper machines ***NEW***

02-03/05/2022: 2-day seminar

Papermaking used to be hard physical work. Today, highly efficient systems are used to form, dry and compress a paper web using a mixture of paper fibres, water and aggregates at high speed. However, papermaking remains a special art that now requires ever greater technical know-how. In-depth knowledge of lubricants and the lubrication of paper machines and material preparation systems is essential and should always be kept up to date.

In May 2022, we will therefore be offering a new edition of our seminar "Lubrication and Oil Monitoring of Paper Machines" after an extended break. In it, we present the lubricants for everything to do with paper machines and address their special requirements as well as application technology. Plenty of practical examples will be included. After this seminar you will master the safe selection and handling of lubricants. You will know how professional oil monitoring works and be able to use it to increase the availability of systems.



Sustainable machine lubrication in practice *NEW*

12/05/22: 1-day seminar

Those who see sustainability as a holistic working principle and the basis for long-term economic systems operation can only win. Lubricant as a machine element is the key to sustainable machine lubrication. In our new seminar, we will focus as an example on hydraulic systems and their fluids. However, the contents of this further training can also be transferred to other oil-filled systems, such as gears, circulating lubrication systems, turbines or compressors. We carefully examine classical weaknesses in the operation of hydraulic systems and also present various ways in which you can operate hydraulic systems more sustainably. The focus is on oil selection, storage, handling and transport, oil monitoring and effective oil care.



Lubrication and oil monitoring for gears

17-19/05/2022: 3-day seminar

Gears – they transmit and transfer energy, movements and forces. Their lubricant influences their performance as well as their service life and thus the efficiency and safety of the connected units. Our speakers will introduce you to the practical basics of lubrication of industrial gears, roller and plain bearings, gears in motor vehicles and the lubrication of circulation systems. Operational lubricant changes will be covered, as will wear mechanisms and typical gearing damage. We will cover in detail the possibilities of lubricant analysis, with which you can determine condition-dependent oil change intervals and reliably discover wear indicators. Also learn how on-line sensors and on-site measurements can help you monitor oil condition and control impurities and wear particles.

Fundamentals of lubricant application – Compact basic knowledge I

31/05 - 02/06/22: 3-day seminar

We provide you with valuable basic knowledge on the most important topics of mineral oil application technology, such as: Principles of lubrication • Lubricants and their tasks • Base oils and additives • Characteristic values and technical data sheets • Lubricants for the respective elements and special applications • Storage and handling of lubricants • Oil monitoring during operation.

The “Fundamentals of lubricant application I” seminar is just as suitable for beginners as for participants who would like to expand or refresh their knowledge. It is also part of the OilDoc certification course “Machine Lubrication Expert” with a total of four units.



Machine monitoring with oil analyses

27 - 30/06/2022: MLA II certification course

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.

A “Machinery Lubricant Analyst (MLA II)” is the recognised expert when it comes to oil and grease analysis for machine and system monitoring as well as quality control. The seminar participants are specifically prepared for the official examination as “Certified Oil Analysis Specialist” of the ICML. You can take the exam virtually at any time and from any location via the ICML online exam platform.

Save the date!

Don't miss this trend-setting OilDoc Conference & Exhibition in Rosenheim in May 2023!

This is where you can finally meet the leading lights of the R&D world, experienced technical specialists and experts on the efficient use of lubricants. They will present their current scientific findings and successful solutions from practice. Three days full of valuable impulses and new contacts await you!

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