



Winter 2019

# OELCHECKER

INSIDER INFO • PARTNER FORUM • TECHNOLOGY FOCUS



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## Össur – Life Without Limitations



Success with Össur – Paralympian Sarah Reinertsen holds the world records in sprint and marathon.

**Össur develops non-invasive prostheses and orthoses that allow its users to live a life without limitations. The company is familiar with the challenges that persons without limbs face on a daily basis and develops solutions in response. All technologies are continuously evaluated and improved. Lubricants are also central structural elements of mechanical prostheses joints, which is why these are critically examined by OELCHECK.**

Prosthesis fittings such as ankle or knee joints are small technical marvels. Össur develops all its products with the goal to allow as much natural functionality as possible for artificial limbs. The company operates five research and development centres in which comprehensive research is performed across various topical fields.

Knowledge from various specialist fields must also be integrated into the German development facility in order to ensure that new products meet expectations. Among other things, these specialist areas

include orthopaedic technology, gait analysis, general mechanical engineering, hydraulics, pneumatics, CAD construction, materials science, plastics engineering, chemistry, textile engineering or also test technology and test station construction. The development site in Bayreuth operates a mechanical laboratory, an orthopaedic test workshop and a 3D gait laboratory. Thus, user and processing tests as well as studies can be performed there.

Prostheses are subsequently manufactured in medical facilities from modular fittings created by Össur. Suitable modules are installed with an individually manufactured prosthesis shaft in order to precisely adapt the prosthesis to the user's requirements.

### Three million steps as a minimum requirement

At Össur, each load-bearing fitting is dynamically tested for three million steps. Ultimately, prostheses fittings must perform reliably under all conditions in order to support the wearer in everyday life. In sports as well, countless sprinters, jumpers, throwers, triathletes, marathon runners and swimmers have been successfully equipped with Össur prosthesis fittings. Only prosthesis fittings for children must withstand greater stresses since a child may, e.g., climb a tree and then decide to jump down.

# Check-up

Christmas is fast approaching – which is also clearly evident in social networks. In fact, everyone seems to be talking about social media these days as it has become indispensable as a modern form of customer communication. Over three billion people worldwide are active in social networks. 38 % use these channels to find offers for products and services. We regard this as an opportunity to take a closer look at our profile as we aim to align the topic of social media with the overall company orientation.

It is our daily motivation to achieve maximum customer satisfaction as an essential basis of our success. It is important for us to not only send but also receive content – social networks promote this kind of dialogue.

We will therefore expand our communication activities and start our “social media offensive”. We will reinforce our presence on Facebook, LinkedIn, Xing and the like and also use Instagram as a new platform. We thereby create a variety of channels for our communications and give customers and potential customers a choice.

The time has come in 2020: We are advancing our social media activity to the next level under the motto #OELCHECKGOESSOCIALMEDIA. Fresh new content will be played on new and old networks. Of course, we will continue to outwardly manifest our philosophy in a transparent and responsible manner – for our customers, partners, potential customers and employees. With this in mind, follow us!



Sincerely, Barbara Weismann



## Fluid: Minimal volume and maximum performance

Microhydraulics are filled with approx. 25 ml or three tablespoons of a special kind of hydraulic fluid. However, despite the little amount, the fluid provides optimal performance. The Össur Cheetah® Knee is also used by marathon runners, which suggest that the fluid is able to withstand tremendous stresses over a long period of time. Small bubbles with oxygenic air form when diffused air cannot quickly escape from the oil. Self-ignition occurs if these bubbles are highly compressed due to the high pressure that can occur within the hydraulics of a knee joint. The oil, which contains hydrocarbon reacts with the oxygen in the air bubbles. Analogous to the self-igniting diesel motor, isolated and incomplete combustion occurs due to insufficient oxygen. Soot particles form from this “diesel effect” that can give the oil a black colouration within a very short period of time.

The toothed segment in the hydraulic chamber poses another challenge. Premature wear can occur if fluid performance is insufficient. Wear can even lead to breaks in the toothed segment and, in the worst-case scenario, block the joint causing the runner with the prosthesis to fall.

## OELCHECK supports development

Safe functionality of hydraulic knee joints crucially depends on the used fluid. However, requirements placed on oils are consistently increasing as the trend is towards smaller, lighter and more efficient hydraulic units, which in turn exposes oils to greater pressures and temperatures.

Össur cooperates with OELCHECK for each new development so that the optimal fluid is used right from the start. Many aspects are inspected during oil analysis. Among other things, the analysis also focusses on viscosity, viscosity temperature behaviour, EP wear protection, lubrication performance, pressure absorption and air output capacity, oxidation and ageing behaviour over a long period of time as well as compatibility with various materials and media.

## Microhydraulics in the knee joint

The human knee is a highly complex joint. Stability and safety are the top priority when replacing the knee with a prosthesis fitting. However, the artificial knee should also move as physiologically as possible, which means that the lower leg on the side of the prosthesis should behave exactly as the still existing lower leg when moving at various speeds. For a majority of products, movements are controlled hydraulically. A small, fully configurable hydraulic cylinder performs similar tasks as the shock absorber of a vehicle. However, the cylinder does not absorb impacts but attenuates the rotational movement.

The Bayreuth facility cooperates with OELCHECK since Össur regards hydraulic oil as a central structural element. For example, the hydraulic oils of two knee joints have already been subjected to certain examinations.

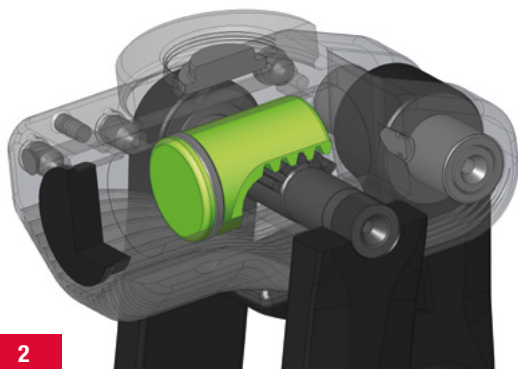
The Össur Cheetah® Knee is one of these highly stressable joints with hydraulic swing phase control.

It was specifically developed for quick flexing and extension while running and sprinting. The 4-axle geometry offers good stability in the standing phase as microhydraulics allow for the configuration of a maximum flexion angle, prevent hard impacts while extended and alleviate walking and the transition from walking to jogging or running.

Microhydraulics installed in the Cheetah® Knee allow for a separate regulation of the attenuation degree in the flexion and extension direction via



valves at the outside of the knee joint. The hydraulics chamber has a toothed rack combined with a toothed segment so that the linear piston movement can be converted into a rotational movement. Heat can build up quickly inside the artificial knee. The joint head can reach a temperature of up to 80 °C during fast running, and joints would heat up even more without the cooling ribs in the lower joint area.

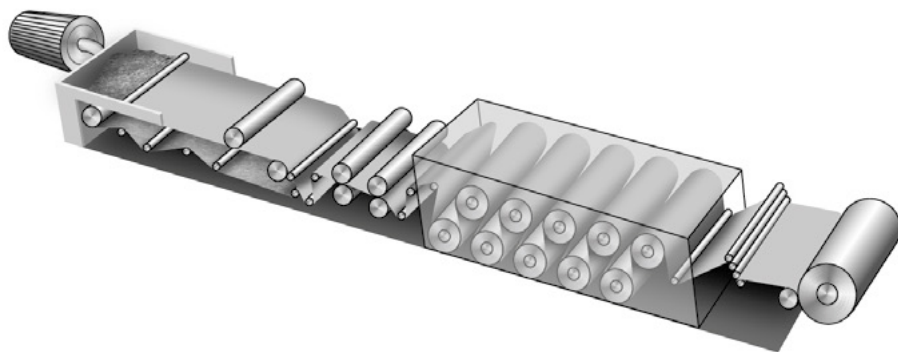


## Össur – Industry innovation leader

Founded in 1971, Össur is presently a market leader in non-invasive orthopaedics and the industry's innovation leader. The company has a staff of over 3,000 employees who develop worldwide solutions for the requirements of users, orthopaedic engineers and medical staff. With headquarters in Iceland, the company also has a comprehensive global presence with additional sales centres in Europe, America, Asia and beyond. Össur operates according to strict and effective quality controls that comply with the requirements of ISO 9001 and ISO 13485 quality management standards.

Further information at: [www.ossur.com](http://www.ossur.com)

# New analysis kit for paper machines








Plant fibres are processed into pulp with water. The fibre pulp is sifted, drained, pressed and dried. The paper manufacturing process has changed since its beginnings. Today, modern machines are used for paper manufacture, producing endless paper webs around the clock in contrast to the manual process in which each sheet was created individually.

The machines used today produce 1,800 meters of paper per minute under extreme conditions. Used lubricants are exposed to an air humidity of 90 %, an ambient temperature of up to 80 °C and fine paper dust. The oil volume of a paper machine will often hold more than 10,000 litres of oil in order to ensure long oil change intervals. However, oil-related machine malfunctions cause large-scale economic damage not only due to long downtimes but also on account of the required oil change, which is why a regular analysis of used lubricants is important. OELCHECK recommends performing an oil change every three months.

OELCHECK now offers a special analysis kit for the optimal monitoring of gear oils, circulating oils, hydraulic fluids, heat transfer oils and greases for paper machines. The set with a mint green cap has the appropriate analysis scope – for any component.

We have already created these kind of industry solutions for gas motors and wind power stations. Based on broad approval from our customers with respect to previous innovations, we have now decided to expand these products to paper machines. Of course, you can continue to use your previously acquired analysis kits.

### All-inclusive analysis kit for all paper machine applications

Test result/procedure					
	Gear	Circulating lubrication	Hydraulics	Heat transfer oil	Grease
PQ index	✓	✓	✓	✓	✓
Visual evaluation	✓	✓	✓	✓	✓
Element analysis of up to 30 elements	✓	✓	✓	✓	✓
Oxidation	✓	✓	✓	✓	
IR spectrometry	✓	✓	✓	✓	✓
IR index	✓	✓	✓	✓	✓
Viscosity at 40 and 100 °C, VI	✓	✓	✓	✓	
Flash point (closed)				✓	
Water with FT-IR (%)				✓	
Water according to K. F. (ppm)	✓	✓	✓		✓
Neutralisation number	✓	✓		✓	
Particle count ISO 4406, cleanliness class	✓	✓	✓		

## Topping out ceremony for the largest OELCHECK building project to date – completion is planned for April 2020

The most extensive OELCHECK building project to date is now in its final stages: The topping out ceremony was held in the prospective new company building at Kerschelweg 18. Construction began in April 2019 – the roof structure was completed in September.

“It has almost become a tradition for OELCHECK to celebrate a topping out ceremony every five to seven years,” said builder-owner Peter Weismann at the beginning of his ceremonial address. He gave a chronological outline of the individual building phases and expressed his gratitude to the companies, architects and government agency

representatives who were involved in construction. Mayor of Brandenburg Matthias Jokisch was also in attendance.

After the traditional topping out speech given by the carpenter, all guests enjoyed burgers and beer – with live music by the Hinterberger Musikanten.

The topping out ceremony also gave us an opportunity to thank the residents for their understanding in regard to all the construction work that had taken place.

The floor finish will be installed just before Christmas if everything goes according to plan. The building is to be completed by April 2020.





## OELCHECK keeps growing – also globally

We have implemented personnel changes in order to cope with new eventualities on account of our increasingly global orientation and rising sample numbers – not only from abroad.

**Carsten Heine**, previously Head of Tribology Team, is taking over the new position of **“Technical Support Manager”**. Mr Heine has been with OELCHECK since 2002. He initially worked for the company as a tribologist. Time and again, he supported our partner OilDoc as a competent advisor. Mr Heine then became Head of Tribology Team. He not only possesses wide-ranging technical and tribologist expertise but also has comprehensive knowledge of all processes that are performed at OELCHECK.

As “Technical Support Manager”, Carsten Heine now supports the majority of our customers and our growing network of exclusive agents. He is the internal contact partner for technical queries from the Sales Team and provides support for technical customer consultation. He also supports our inter-

national exclusive agents in word and deed directly on-site and from the office in Brannenburg.

We presently have exclusive agents in China, Russia and Taiwan. Moreover, we are in discussion with other partners since our international business is to be further expanded with additional agents. Therefore, finding the perfect person to fill the position of “Technical Support Manager” was a very important step.

Dipl.-Ing. (UAS) M. Eng. **Norman Rohrwick** is taking over **Head of Tribology Team**.



After his studies of mechanical engineering, Mr Rohrwick was a technical officer in the German navy. He then worked for the Bundeswehr in the

area of damage analytics and condition monitoring. Since 2016, he has worked at OilDoc as an advisor for seminars, workshops and online training measures – predominantly with the focal points of motor and gear oils, machine monitoring via oil analyses and oil sensors.

He brings his extensive expertise in the areas of lubrication, proactive maintenance, condition monitoring as well as lubricant and operating fluid analyses to his new position. As Head of Tribology Team, he is responsible for technical management and human resource management of currently seven tribologists – all experts in the evaluation and assessment of oil analyses.

The Tribology Team is one of the most important pillars of the company. For a meaningful evaluation of analysis values, it is always necessary for employees to follow the latest technical advancements on the lubrication market, regularly discuss, among other things, structural particularities of oil-lubricated components with component manufacturers and, of course, possess the ability to consistently further develop utilised analysis procedures.

This is how we successfully established ourselves in the past as pioneers in the lubricant and operating fluid analysis industry and how we are consistently and successfully confronting new challenges in the present.

## “Employees for employees” at Schliersbergalm



This year’s team event brought us to Schliersbergalm, an alpine pasture at an altitude of 1061 m. Spectacular vistas across Lake Schliersee and exciting workshops awaited us on this wonderful weekend.



One group learned to professionally prepare alcoholic and non-alcoholic cocktails from an experienced barkeeper.

Another group enjoyed coffee in the barista course and prepared speciality coffees with a portafilter machine. The coffee expert also addressed the intricacies of creating the perfect creamy milk froth.



The rum workshop introduced another group to Caribbean liquor, which included various tasting rounds – all participants were delighted to discover the variety of tastes and aromas that rum offers.



Dumplings, steaks and salad for the evening buffet were prepared in the adventure cooking workshop where ingredients were kneaded, cut, minced and refined. A professional chef also offered tips and tricks.

At dinner, colleagues presented the contents of the various workshops.



Rum was handed out; cocktails were mixed and coffee specialities prepared. All under the motto: “Employees for employees”. Everyone then celebrated and danced late into the night.



Depending on fitness level and personal preference – the agenda for the next day included mountain-biking (with or without motor), hiking and Nordic walking. Whether relaxed on the e-bike or hiking on foot – we all enjoyed the idyllic autumn season around Lake Schliersee.

A tremendously successful event all-around!

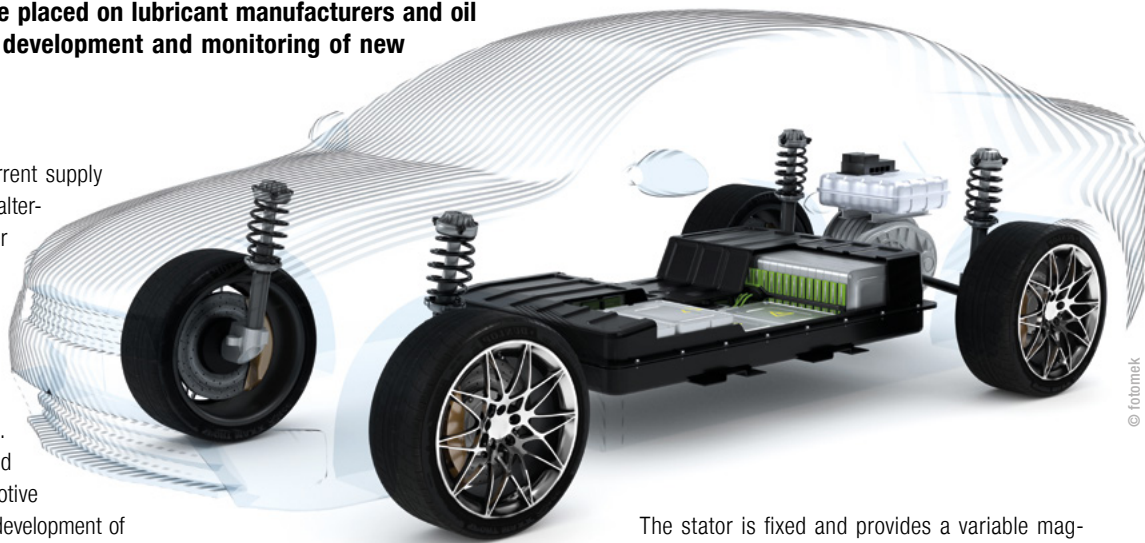
# E-mobiles – Lubrication and Cooling while Electrified

**The motto: “No more petrol!” Quiet, emission-free electric vehicles will dominate the streets in the future. Although e-mobiles no longer run on petrol or diesel, they still need lubricants and functional fluids. However, these lubricants are different from known classics.**

**Tremendous expectations are placed on lubricant manufacturers and oil analysts with regard to the development and monitoring of new products.**

E-mobility is booming, and the current supply of hydrogen-powered fuel cells or alternative fuels will most likely not cover the demand in the next years. New registrations for battery-powered electric vehicles in Germany are still marginal. Approximately 220,000 electric cars were registered on 1 November 2019. However, numerous promotions and billions of investments from automotive manufacturers support the further development of e-mobility so that Germany no longer lags behind China and the US. The technological goal is ambitious. Vehicle manufacturers, suppliers, politicians and we as end consumers will be confronted with many questions and challenges in the next years.

The more e-mobiles are on the road, the higher the demand for electricity. Control over the entire electrical grid must be optimised, and the network of charging stations must be expanded for comprehensive coverage. Charging times for batteries are to be further reduced and ranges maximised. The currently common lithium-ion battery exhibits high specific energy, but the worldwide sought-after metal is highly reactive. Its usage has many negative consequences for the environment and local population. Although used lithium-ion batteries can be recycled, the process remains extremely elaborate. The battery must be operated within a specific temperature range in order to achieve a long service life and optimal effectiveness of the vehicle. Other vehicle components also play a role.



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## Battery, motor and command centre

Electrical skateboards and hoverboards are among the smallest battery-operated means of transportation. Many engineers have borrowed from the structural design of these little speedsters in order to design their e-vehicles. The heaviest part, the battery, is placed centrally in a relatively low position. The “skateboard design” supports good roadholding, allows for a large wheel distance and ensures more space in the interior of the car.

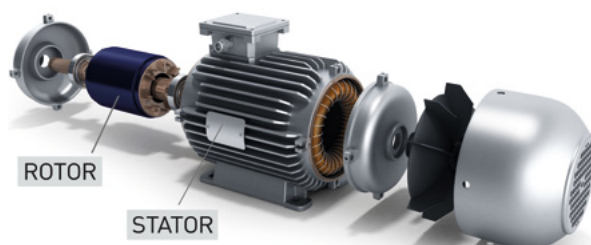
Electricity, sourced from a charging station, provides the power for movement and is stored on-board in one or multiple batteries that supply electricity to the drive. A separate low-voltage battery supplies smaller additional electric motors e.g. for electric windows, windshield wipers, air conditioning or the radio.

A synchronous alternating current motor is installed as the electric drive. In simplified terms, the car is propelled in the following manner: The alternating current motor consists of two magnets – the stator and the rotor.

The stator is fixed and provides a variable magnetic field by means of the alternating current. The rotating rotor consists of a permanent magnet or provides its magnetic field by means of direct current. Both magnets alternately attract and repel each other. The rotor turns, and this motion is transferred to the wheels via the gear. For an electric motor, the maximum torque is available for a comparably high speed range. However, speeds from 0 to over 200 km/h cannot be achieved merely with engine speed. A gear is required. Instead of a transmission with 4 to 10 gears, only a one to two-gear transmission is needed to cover the entire speed range.

A battery with a capacity of 150 kWh as in the case of the Audi e-tron supplies energy to the electric motor. Charging a depleted battery with a common 3-kW household electrical socket would take several days. “Filing up” at a quick charging station with 50-kW power supply would still take 30 minutes for a driving distance of approx. 150 km. However, the first ultra-quick charging stations are being established along autobahn service stations at which an 80-% battery charge can be achieved during a coffee break.

The engine speed is regulated with power electronics via a “power pedal”. Power electronics are the “command centre of the e-car”, consisting of an inverter, a direct current converter and an electronic



© nosorogua

control unit. The direct current from the battery is converted into alternating current required by the motor. Power electronics control the alternating current frequency and thereby the engine speed and also regulate the electric amplitude and thus the motor output power.

They also play an important role when braking. Kinetic energy is not wasted but recovered when the driver takes the foot off the pedal. The vehicle brakes by “recuperating”. The electric motor functions like a generator during recuperating or regenerative braking. Gained electricity is stored in the battery. The power electronics accordingly adapt the energy supply.

### Lubricants and coolants reinvented

Specific clearances are provided by many automotive manufacturers for lubricants and coolants that are used in vehicles with petrol or diesel motors. Their requirements are taken into account in the specifications of the ACEA (European Automobile Manufacturers Association) and API (American Petroleum Institute).

Although e-vehicles do not require motor oils, gear oils, lubricant oils and greases as well as coolants, e.g. for the battery, remain indispensable.

However, these products must fulfil very specific requirements. No e-vehicle manufacturer to date has defined a generally valid clearance list with specifications for lubricants and coolants. Furthermore, OEMs are still pursuing different approaches for the design of their e-mobiles. Therefore, lubricant manufacturers cannot yet engineer oils and coolants that are universally compatible with all e-vehicles.

An e-mobile requires battery coolant, automatic gear oil, brake fluid for the disc brakes and low-viscosity greases for the roller bearings of the electric motor but also for other small components such as windshield wipers, the seat adjustment or the central locking system.

The number of existing types is not too great – but wholly new demands are placed on lubricants and coolants.

Supply for the drive and auxiliary aggregates ranges from 30 volts to 1,000 volts AC (alternating current) or 60 volts to 1,500 volts DC (direct current). Utilised fluids and greases sometimes come in direct contact with electrical and/or electronic vehicle components and must be reliably insulated for the entire usage time in order to prevent short-circuits and sparking. Moreover, they must be compatible with copper, a variety of plastics and sealing materials.



© teksomolika

### Battery requirements are demanding.

The top priority is to keep the battery temperature in an optimal range so that e-cars can be operated at a high efficiency level. Desired chemical reactions within the battery and the battery power decrease at temperatures below 0 °C. However, the battery should also not become too hot. Batteries age quickly at temperatures above 30 °C, and irreparable damage can occur when exposed to temperatures over 40 °C. Only batteries that are operated in a moderate temperature range from 15 to 30 °C can perform adequately over a long period of time, thereby fulfilling up to approximately 70 % of the range stated in the brochure. A well-functioning thermal management system is indispensable in order to ensure that the battery can even go that far.

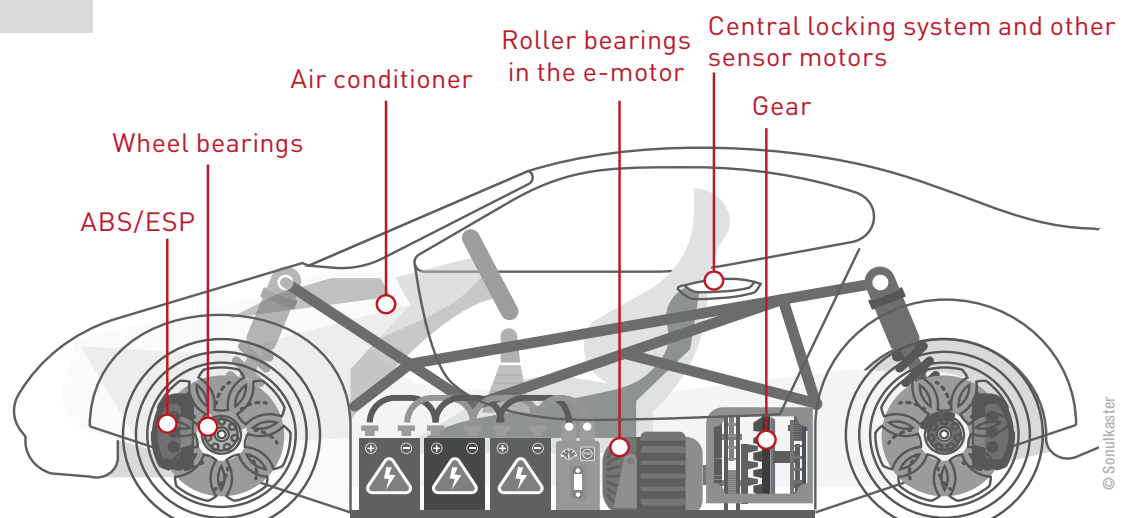
Vehicle manufactures pursue different paths in order to achieve this goal:

- Thermal management of the battery management or battery pack can be realised by means of an air conditioner coolant circuit. A cooling plate is installed for the condenser and evaporator of the air conditioner. Its supply with air conditioner coolant is controlled separately via valves and temperature sensors. A power-consuming auxiliary heater ensures that the temperature does not sink too low in the winter.
- A complex cooling and coolant system with several coolant circuits and separate components is often used for highly powerful batteries over 100 kWh. The coolant circuit of the air conditioner is integrated in the cooling of the battery. An additional heater heats the coolant and battery in low temperatures. The system is most often filled with a water-glycol mixture whose formulation deviates from previously known coolants.
- Tesla is pursuing a different path: More than 7,000 individual cylinder-shaped lithium-ion cells are installed in the Model S with an 85-kWh battery pack. The internal chemical composition and the linking as well as the charging and discharging of individual cells are specifically designed for long-distance electric cars used by Californians. Individual cells are directly flooded with special coolant.

Nowadays, classic coolants that are based on glycol concentrates and mixed with lots of water are only seldom used. The industry has developed new cooling fluids for the special conditions of e-mobiles that, e.g., contain water mixed with paraffin, glycol and surfactants. The direct cooling of battery cells is optimised with a higher storage density and transport capacity.

### New lubricants – new challenges

- Partially direct contact with electrical and/or electronic components
- Insulating effect in order to avoid short circuits and sparking
- Usage throughout the entire service life
- Compatible with copper, many plastics and seals



© Somulka



## Three key components



© pigottschaik

Battery-fed power electronics, the e-motor and automatic transmission – these are the three key components of an electric drive train. It makes sense to combine these within a common casing in order to reduce costs and weight. This also makes it possible to supply them more easily with a single fluid, an innovative e-drive fluid. However, this is easier said than done. The gear must be lubricated to ensure low wear and abrasion. The other components especially require heat dissipation. Some renowned lubricant manufacturers have already developed special fluids with a cooling function that also lubricate the gear. These e-drive fluids must be extremely thin as efficient thermal dissipation is needed but also because the input speed of the gear is most often higher than 10,000 revolutions per minute. Its viscosity roughly corresponds to that of diesel fuel. General information about the formulation of these products cannot be currently provided. Engineers are feverishly working on developing innovative e-drive fluids. However, mineral oils or mineral-oil mixable synthetic oils are hardly used as a basis for pilot projects, but rather water mixtures with more than 50 % consisting of other components, silicone oils or glycols.

E-drive fluids must cope with a whole range of electrical, thermal, tribologist and chemical challenges. They must perform under high voltage while directly contacting copper components, elastomers of seals and insulating varnish within the e-motor. These fluids must not absorb water in order to retain a high dielectric strength and thereby prevent electric arcing between live parts.

Special challenges arise with respect to compatibility between liquid and various materials – most of all copper. Copper's high electric conductivity makes it the most important but also critical component for all live lines as well as for the coils in the e-motor. E-drive fluids are to be highly compatible with copper.

Not only the batteries, but also the power electronics and the electric motor must work within a

moderate temperature range. It is imperative that e-drive fluids provide efficient heat dissipation for temperatures up to 180 °C. Operation above the maximum temperature necessarily reduces the service life, efficiency level and range of the vehicles.

However, extremely low-viscous e-drive fluid is not only responsible for the electric motors, but also contributes to securing the power transfer via the transmission. Many requirements must be fulfilled. Reliable lubrication, protection against wear and corrosion, high ageing stability, high material compatibility and a minimal tendency for foam formation must be ensured. Thus far, only lubricating oils whose viscosity is more than 10 times higher than the newly developed e-oils have exhibited these qualities.

## Braking saves power

Modern electric vehicles are predominately moved over longer distances with the accelerator pedal. If the driver takes the foot off the pedal, the vehicle brakes automatically as kinetic energy is recovered. Since braking is somewhat time-delayed, e-mobiles are additionally equipped with conventional disc brakes. According to the manufacturer's specifications, these require the classic brake fluid DOT 4 or DOT 5.1, which mainly consists of temperature-stable polyglycolic compounds. In some cases, the silicone-containing brake fluid DOT 5 is to be used, which may not be mixed with other types.

## New challenges for lubricating greases

Most bearings, gear motors, hinges, guides or other small components in a vehicle only work with a service-life lubricating grease. An e-mobile requires approximately 2 to 3 kilograms of various lubricating greases. The greases must fulfil very specific conditions at some grease points especially if they contact electronic components, electric currents and electromagnetic fields. Furthermore, compatibility with protective varnishes, soft plastics and copper is additionally required at some grease points. Lubricating grease for roller bearings within electric motors is subject to especially high requirements due to high temperatures and speeds. The grease must not only provide reliable lubrication, but also reduce noise and vibrations!

## OELCHECK challenged

The automotive industry is currently reinventing itself. The environment of the supplier industry is changing dramatically. Lubricant manufacturers are also affected. The demand for customary motor oils will significantly decrease in the next years. At the same time, manufacturers must adapt parts of their production to totally new lubricants and coolants for e-vehicles. However, standardised specifications for e-mobile lubricants have not yet been defined. Various approaches are being pursued that do not allow for standardised specifications. Long-term experience values in regard to the behaviour of new lubricants and coolants based on long-term usage are not yet available.



Lubricant analytics plays a decisive role under these conditions. Comprehensive expertise, practical experience and the highest degree of flexibility is demanded of OELCHECK. OELCHECK is actively participating in the new DIN committee "Electric properties of oils". The committee deals with changes to operating fluids due to electrical properties that affect lubricants in the area of e-mobility. We are also contributing our expertise for the research project "High-voltage suitable e-drive oil" of FVA (Forschungsvereinigung Antriebstechnik e.V.). Although standardised analysis and evaluation methods for lubricant changes of e-mobiles have not yet been developed, we are already providing significant assistance to OEMs with respect to batteries and gears, test station operators and lubricant manufacturers. Discussions are currently being held about expected speeds, temperature stresses, insulation capacities as well as wear and additional requirement scenarios. We will soon have significantly more practical usage data at our disposal with regard to the behaviour of e-drive fluids, greases and coolants. Based on the results of our laboratory examinations, practical experience and the expertise of our tribologists, we will then decide which of our test methods is to be adapted for the evaluation of e-mobile lubricants and operating materials and which threshold values apply for the estimation of remaining usage time.

OELCHECK is still focused on lubricants and operating fluids for electric cars. However, initial consultations with manufacturers of electrically operated omnibuses and lorries are already ongoing.



# OELCHECKER

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## IMPRINT

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## Q & A

We have commissioned OELCHECK for many years with the analysis of lubricant samples from our facilities in Germany. Our representatives currently use laboratories based in the respective country for lubricants that are used abroad. Unfortunately, we are neither satisfied with the quality (large deviations for trend analyses) nor the scope of the analysis. An option to enter the determined values in our own database in Germany is also not envisaged, and a well-founded diagnosis of the values is not provided.

**Can OELCHECK in Germany examine samples from other countries?**

**OELCHECK:**

Of course. OELCHECK in Germany can analyse and examine samples from all over the world. Many of our customers who use their machines worldwide send their samples directly to us from abroad.

All determined values are collected in a joint customer database. Moreover, you can also receive a notification, e.g. during the warranty time, to inform you whether the lubricant recommended by the manufacturer is being used.

The OELCHECK laboratory regularly analyses significantly more values than nearly all other lubricant analysis laboratories, which is why we are able to detect more correlations and causes in case of unexpected results. Other laboratories often lack suitable threshold values in order to provide meaningful comments, and comments often only contain simple statements written by chemists and not – as at OELCHECK – by tribologists or mechanical engineers. Thus, competitors will issue short comments such as: "The iron value has risen." Well, you do not need to be an expert to see that...



An OELCHECK tribologist, on the other hand, will state that the iron value has risen due to corrosion as water, e.g. due to a pressure washer, has intruded into the lubrication system. He recognises this because, among other things, hardly any magnetisable iron (mechanical abrasion) is present and the presence of sodium and potassium additionally suggest "hard" tap water. You can recognise errors and initiate corrective measures or additional controls based on comments individually created for each sample.

In contrast to the laboratories of most lubricant manufacturers or other competitors abroad, high German and international standards such as ISO 17025 are consistently applied within our company. Analyses are performed quickly and accurately by experienced and trained laboratory employees who exclusively examine lubricating oils and greases, coolants and insulating oils

Also with regard to samples shipped to us from abroad, you can rely on all-inclusive customary OELCHECK services such as the 24-hour service or mailing of laboratory reports via e-mail. Comments can be directly translated online – 15 language are currently supported.

**How does it work?**

The procedure is essentially the same as for samples within Germany: Order the all-inclusive analysis kit, take the sample and send it to us by UPS.

The easiest way is to contact our "Service & Sales" department (sales@oelcheck.de, Tel. +49 8034 9047-250) prior to submitting your first order from abroad. You will receive an individual offer from us as well as the necessary documentation and papers that are required for smooth and quick shipping to Germany.

In China, Taiwan or Russia (including CIS countries), our exclusive agents handle the entire process. Our agents on-site are experts in the lubrication industry and are familiar with technical terms, legal provisions and customers. In addition to consultation and the sale of all-inclusive analysis kits, they can also translate sample consignment notes and handle the sample entry. Thus, our German tribologists are able to answer questions that may be in Chinese for example. Exclusive agents provide on-site consultation and organise the quickest possible return shipping of samples (e.g. under five days from China). Thus, the OELCHECK laboratory report from Germany often arrives quicker than locally analysed samples.

**Do you want to become an exclusive agent?**

More and more internationally operating customers rely on the independent expertise provided by our laboratory and tribologists, which is why we are expanding our agent network. Please contact us if you wish to expand your sales portfolio with the sale of all-inclusive OELCHECK analysis kits.

**OELCHECK is ready to answer any questions you may have about tribology or lubricant analyses. You can contact us by email (info@oelcheck.de) or fax +49 8034 9047-47.**

TAE Technische Akademie Esslingen

**Besuchen Sie unseren Stand!**

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