

**ADDINOL Service Products**

Specially developed service products support cleaning procedures or regular maintenance and repair work.  
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**Product News**

Brand new in the broad ADDINOL range. We provide the optimal solution for every lubrication-related challenge.  
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THE ART OF OIL · SINCE 1936



➤ **Simply selected, well shifted – With the new ADDINOL ATF series**

Smaller designs and lower oil volumes, higher power density and rising ambient temperatures not only describe the general trends in drive technology but especially the increasing requirements for automotive transmissions. Greater complexity and specific technical standards demand the use of high-performance, precisely tailored lubricants for efficient and reliable operation over the entire lifespan.

**Perfectly fitting and clearly structured**

Thanks to the future-oriented development work of our R&D department, ADDINOL now offers an extensive range of products with the new ATF XN series for both modern and conventional stepped automatic transmissions. Our ingenious formulations are specifically tailored to the highly complex design of the transmissions. The ATFs reliably lubricate, cool and protect all components, from torque converters, clutch and brake units to planetary gear sets and hydraulic controls, with optimal power transmission. Choosing the right product for users, workshops and dealers is as easy as can be: the number in the product name indicates the number of gears, while the product colour is already visible on the label.

**Your advantages at a glance**

The automatic transmission fluids of the new ADDINOL ATF XN series are characterized by excellent cold start performance, extraordinary ageing stability and high shear stability, optimal friction behaviour and reliable protection against corrosion and wear, guaranteeing maximum shifting comfort and maximum efficiency. Simultaneously, they achieve extended operating intervals and support a long service life of the gear components.

**The right product for every application**

The new range offers the right product for every application: it includes ATFs for older vehicles with conventional automatic transmissions with 3 to 5 gears as well as lubricants for state-of-the-art transmissions with up to 9 gears. The ADDINOL ATF XN series is rounded off by ADDINOL ATF XN HD: a fully synthetic automatic transmission fluid for use in buses and commercial vehicles. The fluid ensures extended oil change intervals, excellent power transmission and outstanding ageing stability. The ADDINOL range also offers tailor-made products for DCT (double-clutch transmissions) and CVT (continuously variable transmissions) transmissions with ADDINOL ATF DCT and ADDINOL ATF CVT.



**ADDINOL AquaPower – Carefree driving pleasure guaranteed!**

Watercraft use has become increasingly popular in the last few years. Fully motorized yachts, powerboats and jet skis are all the rage. For the reliable lubrication of engines, transmissions and other components, we now provide just the right range of products.

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**Modern testing methods – For further development of lubricating greases**

Lubricating greases are characterized by the sophisticated interaction of their components. This makes the formulation of a lubricating grease a complex task. Tests on various model test benches are an important part of this process.

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**Investing in the future – Commitment to location**

By investing in production and warehousing, the increased demand for specialty lubricants for industrial applications can be met also in the future. Completed or in development, these embody a commitment to the production and quality »Made in Germany«.

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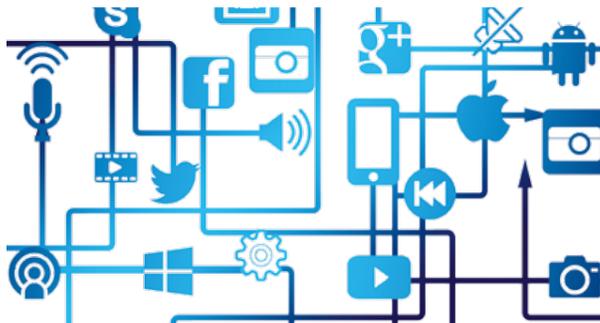
## Editorial

Georg Wildegger

Management  
ADDINOL Lube Oil GmbH



# ADDINOL on Social Media



### #addinol – heavily networked on the World Wide Web

Social Media has become an integral part of our everyday lives. Since the release of the ICQ messaging service in 1996, history has run its course and a lot has happened. Companies target customers more precisely than ever before, and Facebook, Instagram, and Co. are as much a part of everyday life as food or television. Now, these developments are also part of almost every companies' marketing and communication plans, regardless if it's an independent craftsman's business or a publicly-traded company.



When it comes to strengthening the company profile, creating brand awareness and addressing your own target group, the Social Media platform Facebook is still very popular worldwide. The brand new company Facebook page [@addinol.lubricants.madeingermany](#) is managed from the headquarters in Leuna. Videos that relay expert knowledge directly from the manufacturer or masterfully showcase the latest product ADDINOL AquaPower can now be found on our YouTube channel.

## A Specialist at the Top

There are supposedly many world market leaders. The question is: when does a company achieve this status, and what are the criteria? Prof. Dr. Christoph Müller from the HBM School of Entrepreneurs, which is part of the Executive School of Management, Technology & Law at the University of St. Gallen (Switzerland), has examined this question and developed an objective and transparent classification for actual world market leaders in the German-speaking (Germany, Austria and Switzerland) region ([www.weltmarktfuehrerindex.de](http://www.weltmarktfuehrerindex.de)). ADDINOL Lube Oil GmbH has also been listed since December 2018 as »World Market Leader Champion« in the index for Germany.



### ADDINOL used worldwide Facebook | @Timley

Articles about ADDINOL lubricants on professional networks such as LinkedIn or Xing and in personal networks such as Facebook, Instagram or Twitter are just as diverse as our international sales network. Many ADDINOL sales partners started early with fan pages and shared their passion for lubricants from Leuna. Since then many of them have accumulated a considerable network of followers.



### Instagram | @addinol\_baku

While Facebook pages show that ADDINOL engine oil is also suitable for hybrid vehicles and give oil changing tips, the photos on Instagram speak for themselves. These provide material for conversation and sometimes even debate. Many followers equate their love for their vehicle with their love for high-quality ADDINOL lubricants from Germany. It doesn't matter if the technology enthusiasts come from Azerbaijan, Hongkong or Sweden.

It was not only our high export share but also ADDINOL's leading position in the world market for high-performance lubricants in the fields of high-temperature chain oils and biogas engine oils that lead to this ranking. In both markets, ADDINOL has achieved a leading position in the market through great team effort and has become a provider of solutions for lubrication challenges. We are no longer just a lubricant supplier: Through close cooperation with customers, OEMs and research institutes, ADDINOL develops products that are tailored to the special requirements of our customers.



### 2-TaktLiebe (2-stroke love) online Facebook | @2TaktScoopel

Enthusiasm for technology, especially for the German cult motorcycle brand SIMSON, is also common on social media. On own profiles or in local communities, fans share their passion for the reconstruction of Schwalbe, Spatz, Habicht and other models and the subsequent riding experience. Sometimes their love goes so far that they use ADDINOL's corporate design to bring new life to an old modeled SIMSON Star...



### Facebook | @addinol.lubricants.madeingermany

... The owner documents his two-wheel projects on the profile »2TaktScoopel«. If you need technical support for rebuilding or repair, you'll find what you're looking for on YouTube channels such as »2Radgeber«. SIMSON meetings, such as @simsontreffensuhl have become well-established events and bring the online community together in real life. The ADDINOL team from Leuna is also there regularly to talk shop.

In recent years, we concentrated on introducing and further developing product families, like our successful gas engine oils, so as to be able to offer our customers a complex package of lubricants specifically designed for one application area. Another example is the ADDINOL FoodProof product group. This was launched in 2017. It contains lubricants that are designed to meet the particularly high technical requirements in the manufacturing and packaging of food and beverages. Gear and chain oils, hydraulic fluids, compressor oils as well as greases and sprays provide optimal protection for the lubrication points of a complete production line while also meeting the strict requirements of food regulations.



### ADDINOL on the road with racing Instagram | @epromotorsport

Motorsport inspires horsepower lovers all over, no matter the vehicle. Our Swedish partner Niclas Edqvist follows his racing passion in a Volvo 240 and shares his love on Instagram at »epromotorsport«.



### Instagram | @artracing.lv

Even high horsepower watercrafts are part of racing. ART Racing from Latvia is devoted exclusively to speedboats and the encouragement of young talents. Videos and photos on Facebook and Instagram show the daring races with top speeds of up to 200 km/h.



## ADDINOL AquaPower – Carefree driving pleasure guaranteed!



The crossing of the Lombok Strait about 800,000 years ago is considered to be the first successful use of watercrafts across several kilometres. Since then, the development of waterborne transportation has continued to accelerate over the millennia, with the use of rafts for at least 45,000 years or the first use of canoes around 6,000 B.C. being just a few milestones. The crossing of straits, rivers and lakes played a decisive role in the development of humanity. Nowadays, the water »transport route« is used for trade, fishing, military purposes and for tourism. Watercrafts are as diverse as their possible uses.

Recreational vessels have become increasingly popular in the last few years. This is also apparent in the rapid pace of technological development. Today, high powered yachts with more than 500 HP, equipped with the latest technology, are no rarity.

The transmissions and engines of motorboats, yachts and jet skis have to deliver top performance and need a reliable partner to do so. The new ADDINOL AquaPower product range is specifically designed for high loads and speeds and is extremely resistant to humidity, fresh water and salt water. Be it a displacer, glider or sailboat, highly motorized or for leisure use: our range offers the right product for every application – maximum operational safety and minimum maintenance costs guaranteed.

### For outboard engines

There's a clear trend toward outboard engines. Nowadays, more and more boats are equipped with these engines due to their high power density. The broad outboard engine range includes two-stroke and four-stroke engines. For optimal power development and the longest lifespan, they require a high-performance lubricant that provides reliable protection against corrosion and wear and forms a stable lubricating film at every temperature. **ADDINOL AquaPower 4T Outboard 1030 and 1040**, as well as

**ADDINOL AquaPower Outboard 2T and 2T S**, were developed specifically for these requirements and are certified according to NMMA standards.

### For inboard engines

For use in inboard engines, the new range offers the engine oils **ADDINOL AquaPower Inboard 1040 and 1540** for operation with petrol and diesel fuel. They guarantee reliable all-round protection against wear and corrosion and excellent starting performance. The oils in the 10W-40 and 15W-40 SAE classes achieve the longest operating intervals, and reduced fuel and oil consumption, thanks to maximum ageing stability.

### For all other applications

The ADDINOL AquaPower series also offers the perfect solution for lubrication points next to the engine. Transmissions for outboard and inboard drives are always optimally served with **ADDINOL AquaPower Transmission Oil 75W-90** at all temperatures and under even the most difficult conditions. The ageing resistant high-performance transmission oil made of synthetic base oils provides maximum load carrying capacity and a stable lubricating film while reliably protecting against corrosion and wear.

**ADDINOL AquaPower Hydraulic Fluid** is used for saildrives, reversing gears, power steering, trim and control systems and ensures excellent protection against wear and corrosion. The high-performance ATF is extremely stable at high temperatures, it is ageing resistant and achieves long service intervals. The **ADDINOL AquaPower Multi-Purpose Grease** is ideal for reliable corrosion protection of bearings and gears. The long-term lubricating grease is characterized by above-average resistance to fresh and saltwater and is also ideally suited for high loads.

### For safe operation

For the use of lubricants in outboard engines, there is no way around the **NMMA** specifications. The National Marine Manufacturers Association is the leading trade association for manufacturers of boats, marine engines and accessories in the USA and is dedicated to promoting and supporting the recreational boating industry. Not only does NMMA set the standards for boats, yachts and boat trailers, it also sets standards for components and oils. The strictest criteria apply here. Only two laboratories worldwide are approved for testing lubricants in accordance with NMMA specifications.



Engine oils used in four-stroke outboard engines are certified according to NMMA FC-W (left). In comprehensive tests, the oils are inspected for viscosity, cold start performance, shear stability and evaporation loss. Two-stroke engine oils for outboard engines are licensed according to NMMA TC-W3 (right) after extensive testing with regard to lubricity, power transmission, rust inhibition and coking tendency.

General specifications from the automotive sector are also used for watercraft. Engine and transmission oils are classified according to the **API** (American Petroleum Institute) into the corresponding performance classes. The **ACEA** (Association des Constructeurs Europeens de l'Automobile) classification, based on the strictest European test procedures, is important for inboard engines. **JASO** (Japan Automobile Standards Organization) and **ISO** (International Organization of Standardization) are used for the classification of two-stroke engine oils.

**ADDINOL AquaPower has passed successful tests in modern boat engines of all performance classes and offers a specifically matched range for use in recreational watercraft. The product range guarantees above-average protection against corrosion and is well equipped for high speeds and continuous loads. Reliable protection is guaranteed even during rest periods.**





# Modern test methods in the development of high-performance lubricating greases



Lubricating greases are characterized by the sophisticated interaction of their components. This makes the formulation of a lubricating grease a complex task, during which many factors must be considered and tested. Selecting the appropriate base oils, thickener type and additives, the addition of solid lubricants and the determination of their respective proportions influence the performance of a grease and its suitability for specific applications. Due to increasingly severe requirements, continuous new and further development of the greases used is indispensable.

As part of targeted development work in our company, high-quality base oils and modern additive technologies are selected and tested in order to optimize formulations and adapt lubricating oils and greases specifically to increasing practice requirements. One important part of this work is the testing on different model test benches. An SRV® tribometer is also used in this process.

## Development of the SRV® tribometer

The SRV® (German for oscillating-friction-wear) tribometer from Optimol Instruments Prüftechnik GmbH is a model test bench for lubricating oils, greases, pastes, dispersions and dry lubricating films, which delivers high-precision, reproducible and standardized results.

In the 1960s, SRV® development began with the aim of creating a practice-oriented, tribological model test that would provide easily distinguishable and reproducible results. Oscillation as a test movement creates difficult, realistic test conditions and enables cyclic observation of the transitions from static to dynamic friction. Ongoing equipment development has resulted in a worldwide standard for tribological model testing, which is also used regularly by many gear and vehicle manufacturers for component testing. ADDINOL uses the latest, currently fifth, generation of devices.

## Advantages of the SRV® tribometer

This model test bench not only allows many standardized tests to be carried out according to DIN, ISO and ASTM, but also simulations, measurement and test procedures as well as tribological analyses with a wide range of settings. The SRV® tribometer allows for a wide range of application-specific test scenarios. The scalability of individual parameters enables a better approximation of the model test situation to the actual operating conditions in practice. Thanks to a wide range of standard test specimens, it is possible to simulate many application-specific contact geometries (e.g. roller and sliding bearings in the test of lubricating greases). Original materials or components can also be integrated into friction contacts. The tests can be carried out up to the limits of load-bearing capacity and require only a small quantity of the substance to be tested.

## Result thanks to SRV® test bench

The test bench facilitates the determination of characteristic values in two basic procedures. These play an important role in assessing the effect, load capacity and service life of lubricants in oscillating motion. On the one hand, the **friction coefficient** is determined by means of a two-hour test at constant load. The lower this value is and the more stable the curve is over the entire test period, the better the lubricant being tested can be judged in terms of its friction behaviour (see Chart 1: Anti-Wear-Test). At the end of such a test run, the wear on the test specimens is measured. Again, the lower, the better. In practice, this means less friction and increased wear protection. At the same time, higher efficiency is achieved by reducing heat losses. On the other hand, the SRV® tribometer enables the determination of the **scuffing load**. The lubricant is exposed to a load which is gradually increased until the friction partners are welded together and the test is terminated (see Chart 2: Extreme-Pressure-Test). The load achieved during welding is called the scuffing load, which is a failure of the lubricating film between two friction partners. The higher the value achieved, the better a lubricant can withstand extreme loads.

## Operating mode of SRV® tribometer

SRV can be used to perform a wear test on two friction partners during a linear oscillating movement in conjunction with a lubricant: The upper friction partner is moved periodically by an electromagnetic linear drive in the frequency range between 0.001 Hz and 500 Hz and strokes between 0.01 mm and 5 mm, while the lower friction partner is pressed under a defined force.

Both results provide conclusions about the suitability and performance of oils or greases in practical use. The following parameters can be set individually so that the load applied to a lubricant in these model tests is as close as possible to its intended use:

- Oscillating frequency in Hz
- Oscillation displacement in mm
- Gliding speeds from 0.0001 m/s to 0.5 m/s
- Test temperature in °C from room temperature to +350°C
- Test force in N
- Test duration in minutes
- Contact surface by choice of counter body (different ball diameters, cylinder or ring possible)

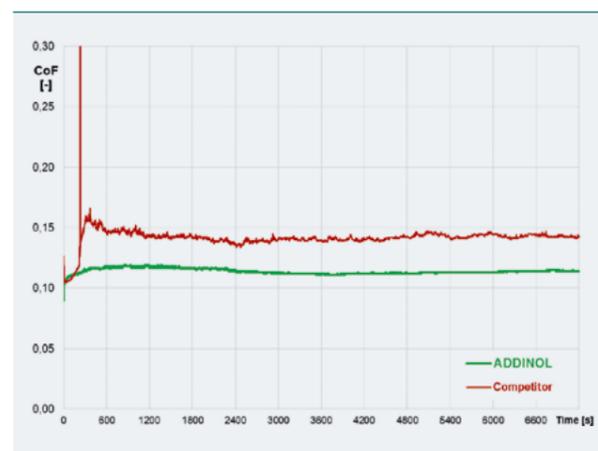


Chart 1: Stable graph for ADDINOL lubricating grease compared to competitor in Anti-Wear-Test.



Chart 2: ADDINOL grease achieves higher load level in Extreme-Pressure-Test compared to the competitor.

## For extra performance



The SRV® device has proven to be particularly useful in the further development of our high-performance greases. Using determined coefficients of friction and wear data under various test conditions during development, we were able to ensure that our new lubricating greases with improved properties provide reliable protection against friction and wear under extreme conditions.

**ADDINOL Hightemp XFT 2 PLUS and Wear Protect RS 2 Syn PLUS polyurea-based greases** are designed to withstand extreme conditions. Abrupt loads, jerky movements and high loads are commonplace in applications such as textile stenter frames or conveyor systems, which is what they are used in. These conditions can be easily reproduced using the SRV®. In Leuna, extensive tests with polyurea greases in different compositions were carried out in order to optimize the formulations and thus to accommodate constantly increasing loads. As a result of the novel composition of base oil, thickener and additives, a significantly reduced coefficient of friction has been achieved. Lubricating greases provide above-average protection against wear and facilitate a significant increase in efficiency while also reducing costs.



Compared to the previous formula, the new formula recorded a significantly higher scuffing load on the Extreme-Pressure-Test. This means that ADDINOL Hightemp XFT 2 PLUS and Wear Protect RS 2 Syn PLUS form an extremely stable lubricating film even with high loads. This is advantageous, for example, in applications in BRÜCKNER film stretching lines, where the new formulation has already proven itself and been approved for practical use.

**ADDINOL Eco Grease PD 2-120 PLUS and PD 2-400 PLUS lithium soap greases** are ideally suited for extreme pressures, strong vibrations and shock loads. These are used, for example, in main and generator bearings in wind power. Our R&D department was also able to optimize the formulation of lithium soap greases with the help of extensive tests on the SRV® test bench. The newly formulated lubricating greases have a significantly improved friction coefficient and a higher scuffing load.

Not all product properties can be tested on the SRV® test bench. In Leuna, we have a wide range of testing instruments and equipment at our disposal and can carry out a multitude of tests. Another important product property of lithium soap greases is shear stability. This is determined in the Grease Worker and can be optimized accordingly. For Eco Grease PD 2-120 PLUS and PD 2-400 PLUS, for example, greater stability was achieved with high loads and long operating intervals.

Lubricating greases based on the **PTFE thickener** are used for extreme thermal loads and aggressive environmental conditions such as tunnel kilns or textile machines. The performance of these greases has also been significantly increased thanks to extensive testing. **ADDIFLON PFPE Premium XH 1 and XH 2 PLUS** as well as **FD 2 PLUS, ADDIFLON Super 2 EP PLUS** and **Hightemp HF 2 PLUS** achieve a significantly higher load capacity in the four-ball tester over long operating intervals. This reduces wear and tear and thus maintenance costs and increases the service life of the components.



**Penetrometer | DIN ISO 2137/ASTM D217 and ASTM D1403**  
The unworked penetration describes the penetration of a lubricating grease at 25 °C without previous mechanical wear stress. The higher the penetration depth of the test cone, the higher the penetration number, the softer the grease and the lower the consistency class according to NLGI.



**Grease worker | DIN ISO 2137**  
In the Grease Worker, the working penetration is determined regularly after 60 double cycles and the extended working penetration after 5,000 to 100,000 double cycles. The lower the deviation between unworked and worked penetration, the more stable the grease behaves during mechanical processing.



**Four-ball tester | DIN 51350/1-6**  
The four-ball tester is used to assess lubricity under high pressure or wear. The set test force either causes the balls to weld together or the upper ball to leave wear scars on the lower balls. The welding force and the size of the wear scars are criteria for assessing the performance of a lubricant during development.

**Three-roll mill:** This apparatus is used to increase the homogeneity of lubricating greases in the final step before filling.



## Professionally supported – with ADDINOL service products

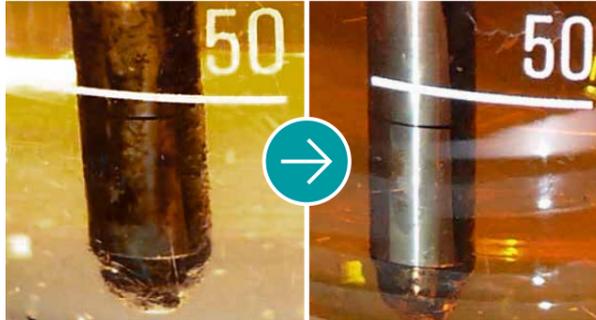
Using high-quality lubricants for heavily loaded gears, couplings or bearings pays off. However, regular maintenance and servicing work with high-quality products also make a significant contribution to extending the service life and ensuring a smooth production process. ADDINOL not only offers the perfect lubricant for almost every lubrication challenge, but also an extensive range of service products.

In the context of general maintenance and repair work, regular use of service products, for example for cleaning components and lubricant supply lines, pays off in terms of trouble-free operation. They dissolve and remove deposits and reliably counteract new deposit formations. Blocked oil feeds, oil distributors and nozzles are flushed and freed of blockages. As surface and corrosion protection or as lubricants and release agents, service products are an indispensable part of daily work. They also offer decisive advantages when commissioning facilities or individual components. Residues at friction partners and aggressive chemicals are reliably neutralized and removed. Deposits are prevented from adhering and a continuous production process is ensured.

### Cleaning and care

Universal cleaning agents, like **ADDINOL Universal Cleaning Spray**, can be used for a variety of applications. It is characterized by its very good dissolving power for mixtures of grease, oil and even damp dirt. If the operating conditions are more demanding, it is advisable to use specially designed service products. With **ADDINOL System Cleaner HT**, ADDINOL offers a highly effective cleaning agent for high-performance chains, sliding elements and roller systems, which are operated at temperatures up to +240 °C. Due to its high temperature stability, the cleaning agent can be used even at extreme operating temperatures. Its active penetration, adhesion and cleaning power dissolves solid or resinous deposits and keeps them in suspension until they are removed from the system. Due to the miscibility with standard chain lubricants no oil change or additional cleaning effort is necessary. It is not suitable for polyglycol-based lubricants. ADDINOL System Cleaner HT is

approved for the chain system of BRÜCKNER film-stretching lines and delivers excellent results.



#### Cleaning effect in the laboratory with the rod cleaning test:

A heavily soiled bolt of a chain system from a press line of the wood-based panel industry is rinsed at 120°C with ADDINOL System Cleaner HT. After 60 minutes the results speak for themselves: varnish and dirt are dissolved and removed by the cleaner. The formation of new deposits is counteracted so that scheduled OEM intervals can be extended.

System cleaning in connection with a planned oil change is also suitable for hydraulic systems and industrial gears.

**ADDINOL System Cleaner 1-33** concentrate with special detergent additives has a highly effective cleaning capacity. Dispersant active ingredients keep the dissolved pollutants suspended in the finest distribution until they are filtered out or removed during the next oil change. Thanks to its excellent corrosion and wear protection, the cleaning concentrate ensures continued operation of the hydraulics or industrial gears until oil change. When it comes to vehicle engines, the break-in of cooling water or black sludge makes cleaning the inside of the engine sensible. Outfitted with a special additive, **ADDINOL Flushing Oil Super** dissolves sludge and solid deposits and completely removes waste oil.

### ADDINOL 360° service

Some manufacturers of machines and components specify in their operating manuals which service products are to be used. Descriptions of cleaning procedures or information on approved cleaning and care products for components and lubrication points support maintenance work. In combination with high-performance lubricants for primary applications, they can counteract the failure of components and even the entire system. If no manufacturer information is available, ADDINOL application engineers will support customers. They know the production processes of the different

industries and can give recommendations for corrosion protection oils, cleaning agents and more. For the maximum effects, the service products that can be used with the lubricants are just as important as the operating conditions and operating time.

When switching to inert greases, for example, the application technology department recommends a thorough cleaning with **ADDINOL Cold Cleaning Fluid M**. This is because lubricating greases containing PFPE cannot be mixed with PFPE-free greases. Incompatibility of the greases can lead to premature ageing, inadequate oil release on the friction surfaces, blockages and wear on the affected components. ADDINOL Cold Cleaning Fluid M also removes possible residues of corrosion protection oil before initial lubrication. If lubrication points that have previously been lubricated with inert greases have to be cleaned, another cleaning fluid, such as **ADDIFLON PFPE Solvent**, is required.

**The use of high-performance lubricants and the regular application of cleaning fluids, corrosion protection oils and care products should go hand in hand to ensure a smooth production process and to minimize maintenance costs. ADDINOL offers an extensive range of service products – from all-rounders to specialists. The application of ADDINOL service products is professionally supported by application engineers and an international network of sales partners.**



#### INSIDE TIP

**Weapon oil – better than its reputation!**

The **ADDINOL Weapon Oil W 18 Spray** got its name because of its suitability for lubrication, preservation and cleaning of different weapon systems and corresponding approvals in this area. But its high efficiency makes it a real all-rounder. Its broad temperature range makes it suitable for use in many climates. It penetrates rust, has an excellent lubricating effect and neutralizes hand perspiration.

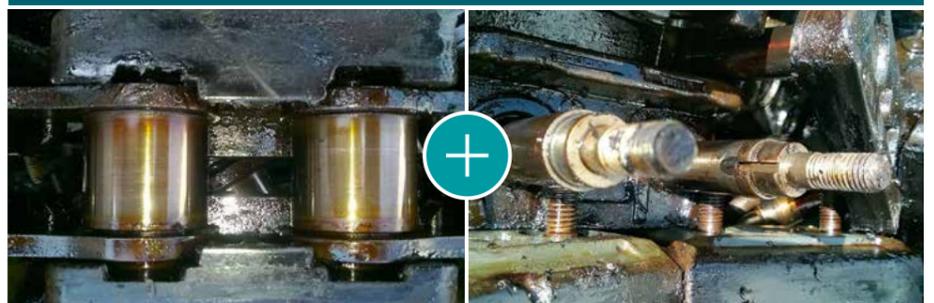
### Cleaning effect in practice

Use after 365 days with a standard chain oil  
**WITHOUT** regular cleaning



Deposits on the conveyor system of the chains as well as heavy deposits and encrustation on the slide shoes and chain links. As a result, the chain system drives consume more power and are subject to increased wear due to inadequate lubrication.

Use after 365 days with ADDINOL Cliptec XHS **AND** regular cleaning  
with ADDINOL System Cleaner HT



The chain links and the pins are mostly deposit-free due to the low tendency of the chain oil ADDINOL Cliptec XHS to deposit and the outstanding cleaning and protection properties of ADDINOL System Cleaner HT.

## Investing in the future – with technology and know-how

ADDINOL Lube Oil GmbH has succeeded in consolidating and expanding its market position as a worldwide quality supplier, especially in industrial applications. We have always managed to take advantage of market opportunities and to promptly implement the necessary investments in know-how and technology, Georg Wildegger, General Manager of ADDINOL Lube Oil GmbH, reflects with satisfaction. The quality of the lubricants has always been a key factor in all our investment decisions.

### Production and technology

The last major investment concept was realized in 2016 at the same time as the 80th anniversary of ADDINOL. The construction measures at that time mainly concerned the production area. Production processes could be optimized by connecting gangways between warehouses, accommodating in particular the growth in the area of specialized lubricants, such as turbine oil. The additional fully automatic filling system for small containers has created capacities that guarantee flexibility even with larger sales volumes. The planned and partly implemented investments in 2019 involve the logistics center. The measures will optimize the flow of goods into the warehouses and at the same time increase capacities for base oils, additives and finished products.

### Tank facilities

**QUANTITY** 2x6 tanks **VOLUME** 50 m<sup>3</sup> per tank  
**CONSTRUCTION STARTED** 04/2019  
**CONSTRUCTION FINISHED** expected 10/2019

#### PURPOSE

Storage of base oils and additives, especially for high-volume lubricants such as ADDINOL Gas Engine Oil MG 40-Extra Plus or ADDINOL Super Light 0540 engine oil

#### SPECIAL FEATURES

- Conically shaped container base and supported on feet to allow residue-free emptying
- Each tank has a dedicated line for filling and a self-draining pipeline to the central register to avoid mixing in the production process



**Last construction stage:** Installation of pipelines leading to the central register

### Blending tanks

**QUANTITY** 8 tanks **VOLUME** 100 m<sup>3</sup> per tank  
**CONSTRUCTION STARTED** 04/2019  
**CONSTRUCTION FINISHED** expected 10/2019

#### PURPOSE

Mixing and storage of high-volume products based on simple to medium formula complexity; relief of blenders in production and increased tonnage per mix

#### SPECIAL FEATURES

- Connection to the third filling and discharging station for tank wagons, equipped with two additional pumps for direct feeding of base oils
- Fitted with filter technology to meet high quality standards
- The additive cocktail is premixed in the production and then blended with the base oil stored in the blending tank by means of a newly installed static mixer; the base oil is preheated to the optimum temperature using a heat exchanger; an agitator in the blending tank ensures optimum mixing
- After the mixing process has been completed, the product can be cooled to the required temperature for prompt filling into a tank wagon or into small and large containers
- The tanks are also stored upright and supported on feet; the container base is conically shaped here as well



**First construction stage:** Foundation for the eight new blending tanks



**In the foreground:** All eight blending tanks have been erected. Until the blending of the first batch in October 2019 pipelines and electro-technics have to be installed yet

### Warehouse

**QUANTITY** one warehouse **SIZE** 5,000 m<sup>2</sup>  
**CONSTRUCTION STARTS** expected Q1/2020

#### PURPOSE

Storage of finished goods; increase in pallet capacity for finished products and provision for larger stocks, from 1l cans up to 1000l containers

#### SPECIAL FEATURES

- 3,600 additional pallet storage spaces for finished products
- 10 consignment areas to prepare pallets for shipment
- 5 gates for loading trucks and containers
- Direct link to halls 2 and 3 and thus consequently reduced distances for transporting pallets directly from production

### Know-how and Service

The »Made in Germany« stamp of quality stands not only for the quality, efficiency and precision of ADDINOL lubricants, but also for excellent customer service. The use of lubricating oils, greases and sprays is comprehensively accompanied by specialists in application technology, research and development and sales, as well as by partners worldwide. True to the maxim »expert knowledge directly from the manufacturer«, the central administration building was expanded in 2016, which houses not only offices but also an entire floor with conference rooms for the ADDINOL Academy. This means that larger groups can participate in the various modules of the academy and, if necessary, at the same time.

Our customers still rely on personal advice when it comes to selecting the optimum lubricant or the necessary cleaning process prior to using an ADDINOL lubricant, says Dr. Robert von der Aa, Head of Application Technology. In daily work, more support is provided by digital services. It is therefore not surprising that we are constantly expanding the range of languages available for our digital services.



The ADDINOL Academy takes place in the new part of the administration building. Various training modules give a detailed insight both into basics of lubrication and special uses.

## ADDINOL Turbine Oils – Put through their paces

The ADDINOL Turbine Oils of the TL, TP and MT series were thoroughly tested by Doosan Škoda Power, a global leader in the manufacturing of steam turbines. After successful completion of the tests they were approved for use in all turbines of the Czech-Korean company based in Pilsen/Czech Republic.

The oils are used in steam turbines with a wide performance range in a large number of power plants: regardless of whether they are operated in nuclear, coal or gas power plants, in district heating, in the steel or chemical industries, in desalination or incineration plants – the Pilsen steam turbines impress everywhere with their quality and performance. In extensive tests, the ADDINOL Turbine Oils TL, TP and MT proved to be a strong partner. Not only did they meet all valid technical requirements and internal standards without any problems, they also stood out from other turbine oils due to their above-average water separation ability. In addition, they reliably protect all components against wear and corrosion and achieve maximum plant efficiency.



## ADDINOL Cliptec XHS 485 FG – Setting new standards

Lubricants used in the production and packaging of food and beverages must be odourless and tasteless and, above all, comply with food law requirements. This also applies to special lubricants, such as high-temperature chain oils used in the manufacturing of food packaging. The new Cliptec XHS 485 FG high-performance chain lubricant achieves a previously impossible balancing act: it demonstrates excellent performance in demanding film stretching applications and can be used where NSF H1 registration is required. ADDINOL Cliptec XHS 485 FG has already been approved by BRÜCKNER Maschinenbau, the leading manufacturer of film stretching lines, after extensive load tests. The high-temperature chain oil is characterized by excellent ageing resistance, reliable wear and corrosion protection as well as high efficiency in use. Furthermore, ADDINOL Cliptec XHS 485 FG conforms to Jewish and Islamic food regulations and purity laws and has Kosher and Halal certification.

## ADDINOL Professional CK-4 – For modern standards

The engine oils ADDINOL Professional 1030 CK-4 and Professional 1540 CK-4 are Super High-Performance Diesel Engine Oils (SHPD) for use in turbo diesel engines in trucks, construction and agricultural machinery with high loads. They are formulated from selected base oils in combination with high-performance additive components, and meet the extreme requirements of Euro IV and the sensitive Euro V diesel engine generation in combination with a very low sulfur content in diesel fuel. They also comply with Euro VI in Iveco and Volvo diesel engines. The oils are ideally suited for the lubrication of highly stressed turbo diesel engines with exhaust after-treatment technologies such as diesel particulate filters (DPF) or selective catalytic reduction (AdBlue/SCR) and exhaust gas recirculation systems (EGR). They guarantee above-average wear and oxidation protection and are extremely stable.



## FoodProof XW 32 M – When the going gets hot

The use of NSF H1 registered lubricants is required by law for food and feed producing companies. Wholesalers, distribution chains and end users are increasingly demanding proof of a physiologically harmless supply chain. In order to meet growing demands, ADDINOL has extended its food-grade lubricant product line with the introduction of the NSF H1 registered heat transfer oil ADDINOL FoodProof XW 32 M, another high-performance product. Food-grade heat transfer oils can be used in applications where the use of steam as a heating medium is not possible and higher temperatures are required. High-temperature processes that occur in food processing and production include roasting, grilling, baking and drying. Other possible applications include the manufacturing of food packaging and the production of food additives.

## ADDINOL Eco Gear GLS – For heavy loads

Locomotives and trams, high-performance dump trucks, low-floor technology and the transport of general cargo – industrial gear units are used where maximum performance is required. The industrial gear oil series ADDINOL Eco Gear GLS combines the requirements of long operating periods and extreme load carrying capacity in one product and is therefore ideally suited to these applications. It is based on high-quality synthetic base oils and a carefully selected additive package and has extraordinary load carrying capacity. Our developers used the API GL-5 specification, known from the transmission oil sector for automotive applications, to evaluate the load carrying capacity. The result is convincing. ADDINOL Eco Gear GLS not only exceeds the common DIN 51517-3 industrial gear oil specification, but also the API GL-5 load carrying capacity requirements.



## ADDINOL Ropeshield DF – For the balancing act

The use of wire ropes for lifting and pulling heavy loads is widespread: they are used on cranes, elevators, shovels and even on oil rigs. They should be properly lubricated for safe operation and a long lifespan even in difficult weather conditions. ADDINOL Ropeshield DF was developed to meet the special requirements in the field of steel rope lubrication. During a comprehensive 6-month performance test at a port in Portugal, ADDINOL Ropeshield DF convinced across the board. The anticorrosive grease ensures comprehensive protection even when exposed to salt water and a wide temperature range. It is characterized by above-average adhesiveness and water resistance and reliably protects steel, aluminum, copper and brass elements. The lubricating grease can also be used on electrical cable systems without any problems.



## 24 hours a day, 365 days a year – that is VARO's motto



VARO started operations in 2012 with the purchase of the Cressier refinery in Switzerland and has been growing ever since. In a short period of time, it established a fully integrated downstream company. VARO has an extensive network of refineries, storage tanks and distribution channels that supply customers in North-west Europe with high-quality fuels, heating oil and biofuels. The acquisition of Schneider Mineralöl Meißen GmbH in 2017 was the starting point for the expansion of the wholesale and retail business in eastern Germany.

For many years, Schneider Mineralöl Meißen GmbH has been a reliable partner for the distribution of high-performance lubricants from Leuna. As a VARO Energy Group company, the newly founded VARO Direct has not only assumed the company headquarters in Meißen, but also the competent employees and the existing sales network. Currently, the company has 104 employees, five of whom are engaged in the distribution of ADDINOL lubricants.

It was immediately clear to Uwe Fritzsche, a long-time employee of VARO Energy Direct GmbH, that the distribution of the lubricants from Leuna should continue: »ADDINOL is a well-known brand from the region. Customers are aware of the excellent quality with which ADDINOL made a name for itself. Its geographical proximity and the years of cooperation are also a great advantage. ADDINOL reacts quickly and competently to our enquiries and we feel very well looked after.«

The product portfolio comprises the entire range of ADDINOL lubricants from engine oils for cars, trucks, motorcycles and tractors to lubricants for metalworking and greases. Its customers include construction and transport companies as well as agricultural companies and the petrochemical industry. VARO also sees good growth rates in the area of gas engine oils for use in CHPs.

Currently, the top-selling oils in the passenger car sector are the fuel-saving engine oils ADDINOL Giga Light MV 0530 LL and ADDINOL Semi Synth 1040. These are available both in small packaging for private customers and in large packaging for forwarding companies and workshops. »These are suitable for a large number of modern, high-performance

passenger cars and vans with petrol and diesel engines. The oils provide optimal protection and ensure a long engine life. This is of course very popular with customers,« says Uwe Fritzsche.

ADDINOL Extra Truck MD 1049 LE, a low-friction engine oil, is also the undisputed bestseller in the heavy-duty range. This Low SAPS oil is particularly suitable for construction machinery and heavy commercial vehicles equipped with new exhaust after-treatment systems. It meets the strict requirements for Euro III, Euro IV, Euro V and the new sensitive Euro VI diesel engine generation. Thanks to innovative additive technology, it protects the exhaust after-treatment systems and actively contributes to a long engine service life. An extremely low evaporation loss and excellent friction properties also reduce fuel consumption.

In the industrial sector ADDINOL Hydraulic Oil HLP 46 is used by many VARO customers. »The quality of the hydraulic fluids from Leuna is well-suited and pays for itself in daily use,« says Uwe Fritzsche. »It is important that customers in the construction sector can rely on the consistent performance of their machinery, regardless of any difficult conditions on the spot. Components are protected against corrosion and wear, maintenance is minimized and long service lives are assured. What more could you ask for?«

Automotive lubricants such as car engine and transmission oils as well as lawnmower oil are sold directly through the company's own network of filling stations. The company's own fleet of vehicles supplies workshops, forwarding agents and dealers quickly and efficiently. The lubricant sale is only one of VARO Direct's business activities. Trading in alternative biogenic and conventional diesel fuels is just as much a part of the range as the sale of a wide selection of heating oils and solid fuels such as wood and coal products is.

Focus on the customer, flexibility and the efficient, sustainable use of energy resources are entrepreneurial values that both ADDINOL and VARO share. »The customer stands at the center of all the company's activities,« says Thomas Müller, sales manager at VARO in Meißen. »With fuels, fuel oils or lubricating oils – we aim to deliver excellent quality and build strong, lasting relationships with customers and

partners. Here ADDINOL and VARO are on the same page. We have not regretted our decision to continue our cooperation after the restructuring and look forward to new joint activities.«

### Facts & Figures about Saxony

**Area:** approx. 18,450 km².

**Location:** East Germany, Neighbouring countries: Poland and Czech Republic

**Population:** approx. 4,077,937

**State capital:** Dresden

**Languages:** German, Sorbian, Saxon

**Climate:** continental

**Famous sights:** Saxon Switzerland, Erzgebirge, Old Town of Dresden (Florence on the Elbe), Thomaskirche Leipzig

**Famous people:** Friedrich Nietzsche, Karl May, Erich Kästner, Gottfried Wilhelm Leibniz, Gotthold Ephraim Lessing, Robert & Clara Schumann, Richard Wagner, August II the Strong

**Agriculture and farming:** grain cultivation, livestock, horticulture

**Industry:** automotive industry, metal production, mechanical engineering, microelectronics/electrical engineering, biotechnology and environmental technology

**Growth potential:** available

**Trivia:** Cultural treasures such as Meißen porcelain and Erzgebirge woodcut art are known all over the world. At the end of the 19th century, Leipziger Messe revolutionized the industry with the invention of the sample fair – more effective than the costly local trade in goods – and thus laid the foundation for modern trade fairs. It originated at the intersection of two important historical trade routes, via regia and via imperii. Saxony is a very musical region and is known for, among other things, the Thomanerchor, where Johann Sebastian Bach conducted as Cantor.

# ADDINOL Lube Oil Danmark ApS – Full Steam Ahead

**ADDINOL Lube Oil Danmark ApS is still a new partner. Owner and managing director Svend Eskildsen has only been engaged in the distribution of ADDINOL lubricants in our northern neighbouring country since 2016. Nevertheless he has already achieved considerable success. The list of his customers reads like a who-is-who of the Danish shipping scene. The friendly Dane is a »one-man company« and the competition is fierce.**

»The phone practically never stops ringing unless I turn it off,« joked the tall Dane, as he calmly and attentively answered his next call. In a very short period of time, Svend Eskildsen has made ADDINOL a name well-known in Denmark, especially with shipping companies and other maritime enterprises. The company's headquarters in Esbjerg, the country's most important North Sea port, was a good strategic choice. In recent years the growing offshore industry has brought a real boom to the city, which has just under 75,000 inhabitants.

The company's founder already had extensive experience in the lubricants business and good contacts when he decided three years ago to venture into self-employment selling high-performance lubricants from Leuna. Svend Eskildsen became aware of ADDINOL during a visit to the HUSUM Wind Fair, where the brand's professional image and friendly tone immediately appealed to him. »I was convinced by the outstanding quality of the lubricants from Leuna, so the decision was easy.«

ADDINOL Lube Oil Danmark ApS's customers include the company World Marine Offshore A/S. It is based in Esbjerg and specializes in complete solutions for crew transfer, offshore logistics and maritime management: a sought-after offer for companies in the wind, oil, gas and construction industries. World Marine Offshore A/S offers its services not only in Denmark, but also in Germany, the United Kingdom, Belgium, the Netherlands and France, and has a whole fleet of vessels for the transport of crew and cargo. The ships exclusively use lubricants from Leuna.

The training ship the »Danmark« as well as numerous ferries and fishing boats sail the seas with ADDINOL lubricants. »ADDINOL has become a real insider tip in the industry,« says Eskildsen. One of the most successful products in the

range is ADDINOL Eco Craft. According to Svend Eskildsen many fishermen are enthusiastic about it: »Not only do they enjoy extremely long operating times with the engine oil, they also save fuel. At the same time, the engine is reliably oiled and protected and that includes bearing heavy loads. It's a pleasure to sell!« Other engine oils, greases and pastes, hydraulic fluids and gear oils are also used.



The training ship »Danmark« is exclusively supplied with ADDINOL lubricants: from the engine to the gear to the hydraulics.

Another pillar of Danish operations are gas engine oils for the use in block-type thermal power stations. Svend Eskildsen has already converted numerous biogas plants in Denmark to ADDINOL gas engine oils. The most successful product is MG 40-Extra Plus for operation with heavily contaminated biogases, closely followed by Gas Engine Oil LG 40 for engines that run on mine gas. »The use of gas engine oils is a very exciting area and has a lot of potential. I would like to develop this even further in the future. The customers in this sector are also very satisfied with the superior service life, which is of course also satisfying,« says Eskildsen. Sales of diesel engine oils for heavy commercial vehicles are also good, and satisfied customers include numerous forwarding agents and haulage companies.

The lubricants are delivered by the boss himself. »We have a large warehouse so that we can react quickly and flexibly to new orders and inquiries. This is essential, especially as a supplier for the offshore industry. After all, the delivery has to be there when the ship is in port and not a minute later,« says Svend Eskildsen.

## Facts & Figures about Denmark

- Area:** 43,094 km<sup>2</sup> (excluding Greenland and Faroe Islands)
- Location:** Northern Europe
- Population:** approx. 5,806,081
- Capital:** Copenhagen
- Languages:** Danish
- Government type:** constitutional monarchy
- History:** settlements probably since Stone Age, starting in the 6th century origin of the first kingdoms, Kalmar Union in the 14th century, 1849: the first constitution
- National holiday:** 5 June
- Climate:** continental
- Famous sights:** Little Mermaid, Roskilde Cathedral, Öresund Bridge, Wadden Sea National Park, Round Churches on Bornholm, Amalienburg Castle and many more
- Famous people:** Hans Christian Andersen, Sören Kierkegaard, Asta Nielsen, Niels Bohr, Margrethe II
- Agriculture and farming:** predominantly family farms cultivating small plots of land, grain cultivation, meat, and dairy farming
- Industries:** food and metal processing industry, printing and publishing, mechanical engineering, transport machinery manufacturing, steel industry, shipbuilding
- Growth potential:** available
- Special features:** The Danes consistently rank high on the happiness index and Denmark is also one of the most bicycle-friendly countries. Liquorice is a Danish favorite. There are a total of 1419 islands in Denmark, 394 of them have official names. Shakespeare's tragedy »Hamlet« is set at Kronborg Castle, which has been a World Heritage Site since 2000.

In addition to all that, Eskildsen also makes a huge impact on advertising with targeted press work and participation in regional trade fairs. This raises the question: how many hours does he squeeze into a day? How does he do it? Is there any time left for hobbies or personal life? »Unfortunately, I don't have time for hobbies,« says Eskildsen. »I have been a member of a golf club for two years. But I've never even played!« Once again, the telephone rings, and Eskildsen answers warmly and attentively.



Always on call: Managing Director Svend Eskildsen



Delivery »Just-in-time«



ADDINOL Lube Oil ApS offers the complete product range for marine applications